Political Economy of Financial Derivatives:

A theoretical analysis of the evolution of banking and its role in derivatives markets

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Declaration for PhD thesis

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Abstract

This thesis starts by observing that banks are central to derivatives markets. It then asks two interrelated questions. First, what is it about banks that allows them to be the heart of derivatives markets? Second, what is it about bank-traded derivatives that has allowed them to become such widely and heavily traded financial instruments? Both questions are approached, above all, as theoretical problems. Existing theories of banks tend not to treat banks as derivatives dealers, and existing derivatives theories tend not to treat derivatives as a banking activity. To answer the questions this thesis deploys a political economy approach, drawing heavily on Marxist method and theory, which entails analysing theoretically the evolution of banks and their role in derivatives markets. Specifically, it shows that banks have become securities and derivatives dealers in addition to their commercial banking activities.

The thesis builds a logical and historical account of the evolution of banking that culminates in a theoretical understanding of banks' role as derivatives dealers. Banks are making derivatives markets for themselves both by standing ready to buy and sell and by providing the infrastructure of the market. The analysis shows theoretically how derivatives themselves are made by banks and how they are suited to trading: i.e., repeated buying and selling with the aim of profiting from price changes. The theoretical analysis is then enriched with an examination of banks' more detailed practices in derivatives markets such as contractual and clearing practices and the use of valuation models. In short, by analysing derivatives as a banking activity and building a theoretical explanation for the evolution and role of banks this thesis explains theoretically the interconnection between banks and derivatives, and on this basis gains an insight into aspects of the broader economy such as the uses of risk management and the regulation of banks.

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1 Introduction

'...on [each of the] the major trading floors of the global banks where we conducted our research between 200 and 800 traders were engaged in trading. ... The traders take their own 'positions' in the market while also offering trades to other market participants, thereby bringing liquidity to the market and sustaining it. ... deals via these channels [go] up to a hundred million dollars and more. ... [A]ll traders on the floors have a range of technology at their disposal; most conspicuously, the up to five computer screens, which display the market and serve to conduct trading. When traders arrive in the morning they strap themselves to their seats, figuratively speaking, they bring up their screens, and from then on their eyes will be glued to these screens, their visual regard captured by it even when they talk or shout to each other, their bodies and the screen world melting together in what appears to be total immersion in the action in which they are taking part.' (Knorr-Cetina and Preda, 2005: 43-4)

1.1 Introduction

It is sometimes claimed that derivatives allow risk-sharing via 'the market'; with no mention of 'global banks' or how or by whom these markets are made. Yet in the popular imagination, in the statistics released by international bodies such as the Bank for International Settlements (BIS) and not least in the financial crisis which began in 2007-8, derivatives are associated above all with banks, and with banks undertaking (frenzied) trading in financial instruments.[1] This dissertation asks what it is about banks that has led them to the very heart of derivatives markets, and what is it about the derivatives that they trade that has led to them becoming overwhelmingly used for trading financial instruments?

[1] I also have personal experience of working for a major Swiss bank for almost 12 years and, like many thousands of other bank employees, never once made a loan or took in a deposit; I did, on the other hand, deal every day with portfolios of hundreds of thousands of derivatives.

The last 30 years have seen extraordinary growth in the scale and scope of derivatives activity and banks, repeatedly buying and selling financial derivatives, are at the heart of this expansion. Prior to the early 1990s the word 'derivative' did not even appear in regulatory documents in the UK and US,[2] and statistics for the global over-the-counter (OTC) derivatives market only began to be collected in the late 1980s (ISDA, 2010d). By 2011 there were approximately US$700 trillion of over-the-counter (OTC) derivatives (measured by notional outstanding amount), and by comparing the amount of turnover per day it appears that the amount traded per day of exchange-traded derivatives (ETD) is of a similar order of magnitude (BIS, 2010b, 2011), Banks have been central to this process, taking on new activities dealing in both securities and derivatives and standing at the centre of these markets as market-makers (Duffie, 2010). Banks as derivatives dealers have made markets in two senses: they 'stand ready to buy and sell' (Levi, 2005: 563) and they provide much of the infrastructure of markets.

Banks' centrality to these markets is a puzzle, and perhaps above all a theoretical puzzle. Existing theories of banks tend not to treat them as derivatives dealers, and existing theories of derivatives tend not to treat them as a banking activity. Neither orthodox nor heterodox economics approach derivatives markets as a problem of banking theory. Yet to understand derivatives' place in and effect on the wider economy, and to understand the detailed practices in derivatives markets we need first to understand what derivatives are and how they came to be a banking activity. There is therefore a gap in the theory, which this thesis addresses to offer a theoretical base that will aid future empirical work. The rest of this chapter, and to some degree the next, show that if derivatives today are to be understood it is necessary to know how banks came to be central to them. This requires a theory of the evolution of banks and their role in derivatives markets.

In order to build such a theory it is necessary to use a method that can address the development of banking: first, how banking and finance have developed from the

[2] Swan notes: 'Apparently, market participants began to apply the term to futures and options in the early 1980s, but the first "legal" use of the term is found in [a] 1982 New York Federal Court case' (Swan, 2000: 5) The House and Senate Conference Committee considering the 1992 Futures Trading Practices Act finally used the term 'derivative' in a regulatory context. (Swan, 2000: 9-10)

workings of capitalism itself, and second, how the banking system has developed to take on new activities such as securities and derivatives dealing. Political economy, with, amongst other things, an emphasis on processes and not static equilibria, is uniquely suited to theorising such a process of development. Here a political economy approach is used that draws heavily on Marxism and historical materialism.[3] This theoretical core is then augmented drawing upon literature from the social studies of finance (SSF).

Applying such an approach to banks in derivatives markets is original in itself, but more importantly, this original viewpoint provides insights that are not to be found in other investigations of the development of derivatives markets. Approaching derivatives theory using Marxist political economy turns much standard analysis on its head – or rather puts it on its feet. As far as the author can tell, this thesis is the first work of this kind that builds a theory of banking in order to explain banks' centrality to derivatives trading, and then draws upon this theory to explain how the material practices of banks in making derivatives markets impacts on the continuing process of the latters' development their and changing character.

The theory developed here takes classical Marxist political economy as a starting point, and above all Marx's and Hilferding's analysis of the emergence of commercial banking from capitalists engaged in exchange (Marx, 1976, 1981; Hilferding, 1910). First, this basis must be reassessed and refined in light of the new activities of banks, in particular derivatives dealing. Second, it must be extended to incorporate first securities dealing and then derivatives dealing. Careful examination of banking theory allows identification of the evolving essence of banks and the attributes they need, first to emerge as specialists among other merchants and then to extend their activities. Derivatives dealing has changed banks, and demands an updating of our theory of banks, their specialisms and their activities. Chapters 3, 4, and 5 provide this update and extend the classical Marxist theory of banks.

In developing a theory of banks as derivatives dealers, this thesis must also draw on other disciplines, including those of economists outside the Marxist tradition

[3] 'Marx's method focuses on historical change' (Fine and Saad-Filho, 2004: 8)

and especially economic sociologists. Their insights are incorporated at an abstract level, for example highlighting the importance and construction of virtuality in derivatives markets; they are also incorporated more concretely when the thesis turns to more detailed manifestations of banks' activities. Specifically, the evolution and role of international bank regulation, of valuation models and risk management and of legal contracts and clearing arrangements are examined. Sociologists in particular have contributed close study of the social and economic relations which make up the practice in these areas. These practices emerge from, and are placed in the context of the theoretical framework developed in the first half of the thesis, and this allows clearer identification of their economic roots and motivations, and in turn richer understanding of how they develop and their effects. These chapters also draw on an examination of more empirical material such as bank regulation, legal documentation in derivatives markets, dealer banks' practices in the back office and in risk management, and the mechanics of derivative valuation models.

The rest of this chapter sets out in more detail the need for a theory of the evolution and role of banks in order to understand derivatives markets. Section 1.2 explores the main empirical characteristics of these markets, starting with their enormous size and rapid recent growth. The late 1980s began a qualitatively different period for derivatives. Inspection of aggregate derivatives statistics since this time reveals the centrality of banks and the financial nature of the derivatives being traded. With this revelation it becomes necessary to understand the processes of development that led to banks becoming derivatives dealers and their influence on the growth and evolving character of derivatives markets, which the rest of this thesis discusses.

Section 1.3 probes the nature of derivatives as a claim that allows trading, which is taken in this thesis to mean buying and selling in order to profit from a change in price. The section begins to explore this by comparing first commodity exchange with physically-settled derivatives, and then physically-settled with cash-settled derivatives. In doing this it shows how there is a qualitative difference between buying and selling a commodity and trading a derivative, and that the derivative form allows larger quantities of derivatives trading. This view

of the nature of derivatives is contrasted with that of neoclassical economics, which sees them as completing markets in an underlying asset.

Section 1.4 illustrates some of these features by examining more closely the mechanics of interest-rate swaps and the evolution of the credit derivatives markets. Section 1.5 concludes and introduces the rest of the thesis.

1.2 Growth in derivatives markets and the role of banks

1.2.1 Growth in derivatives markets since the late 1980s

Derivatives markets are often split into over-the-counter (OTC) and exchange-traded derivatives (ETD); a snapshot of the markets shows just how large both have become. Many common measures of economic activity such as gross domestic product (GDP), corporate profits, etc. are not directly comparable with the measures of derivatives markets (e.g. those provided by BIS statistics). Problems include mixing stocks and flows, mixing gross and net, and mixing leveraged and non-leveraged instruments. Nevertheless, it is possible to gain an initial understanding of the scale of derivatives activity by casual comparison of the statistics and other well-established economic variables. Table 1.1, below, shows estimated global GDP for 2010 at US$2 trillion. A slightly more meaningful comparison can be made to aggregates of other financial assets: global stock market capitalisation was estimated as US$55 trillion and the total for bonds, equities and bank assets as US$250.4 trillion (IMF, Sep 2009).

As can be seen, the statistics for derivatives are enormous by comparison. The statistics most commonly used to measure the size of the derivatives market, shown in the bottom half of Table 1.1, are those of the BIS.[4] Average daily exchange traded turnover, which is a subset of all ETD, was US$8.1 trillion.[5] Comparing OTC and ETD market measures is tricky, but if turnover in OTC seems slightly lower than in ETD markets it is nevertheless of a similar order of magnitude: average daily turnover just in interest rate (IR) and foreign exchange

[4] Published in the 'Semiannual OTC derivatives statistics', (including the BIS quarterly 'Statistics on Exchange Traded Derivatives') and the BIS 'Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity'.

[5] BIS statistics for Exchange-traded derivatives do not include all product types and hence these aggregates underestimate the total for all ETD contracts. Similarly the turnover statistics for OTC derivatives are for interest rate and foreign exchange derivatives only.

(FX) OTC derivatives was US$4.5 trillion (this excludes other types of OTC derivatives such as credit derivatives, equity derivatives and so on for which data is not available). Both of these are multiples of global GDP/day. The gross global market value of OTC derivatives outstanding at the end of 2010 was US$21 trillion compared to a stock market capitalisation of US$55 trillion, while the biggest and most commonly-quoted statistic of all, the OTC notional amount outstanding, was US$600 trillion, more than double aggregate global bonds, equities and bank assets. Even considering the multiple problems of measurement, the derivatives markets is at least comparable in size to the traditional financial sector.[6]

Table 1.1: Summary statistics of the global economy and derivatives markets at end 2010

Measure	US$ amount (trillions)	Stock/ flow	Source (see below)
Global GDP	63/year 0.17/day†	Flow	1
Global Stock Market Capitalisation	55	Stock	1
Global Bonds, Equities and Bank Assets	250	Stock	1
OTC Notional Outstanding	601	Stock	2
OTC Gross Market Value	21	Stock	2
OTC IR and FX Turnover††	4.5/day	Flow	3
ETD Turnover (Q4 2010)	8.1/day	Flow	3
ETD Outstanding	83	Stock	2

† Assumes 365 days/year.
†† Global foreign exchange market turnover excluding 'spot' = 2.49tnUSD/day (source: BIS, 2010b:Table 2). Global OTC interest rate derivatives market turnover = 2.057tnUSD/day (source: BIS, 2010b:Table 6).

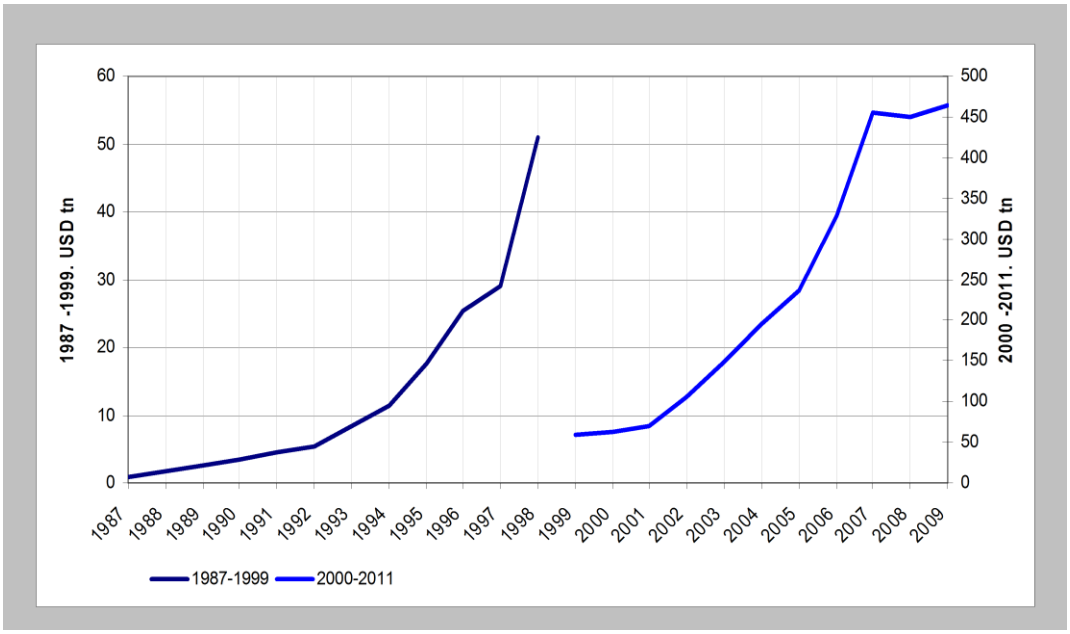
Sources: 1. IMF (2011), 2. BIS (2011), 3. (BIS, 2010b)

More important than this snapshot, however, is the growth that derivatives markets have undergone, and the data available for OTC markets provides a measure of this growth. Statistics on OTC notional amounts outstanding collected by the International Swaps and Derivatives Association (ISDA) since

[6] Moreover the OTC and ETD market are broadly, similarly active. OTC markets can appear larger than ETD markets because of the extraordinarily large notional outstanding amounts. Whilst the measure of notional amount outstanding has its virtues, it should be borne in mind that offsetting trades in OTC markets are not automatically terminated (recent trade compression exercises and central clearing notwithstanding), while they generally are on exchanges, leading to a lower notional outstanding figure. For this reason turnover is perhaps the most appropriate measure for comparison of the scale of OTC and ETD market activity.

1987 have been generally superseded since 1998 by those from the BIS, although the two surveys are broadly comparable.[7] (ISDA, 2008) Figure 1.1 below shows extraordinary growth since 1987. The data is presented on two axes to show how the rate of growth from 1987 to 1997 was every bit as startling at that from 1998-2008. In fact notional outstanding doubles every two or three years for most of the period, slowing only with the onset of the financial crisis in 2007-8.[8]

Figure 1.1: Growth in OTC Notional Outstanding from 1987-2010 (ISDA)



Source: (ISDA, 2010d)

Globally-consolidated publicly-available data on OTC derivatives only stretches back to the late 1980s; this start date can be seen as instructive. While it would of course be preferable to be able to access data from before then, it also seems likely that data becomes available at this point because a dramatic change was under way in financial markets, and in derivatives markets in particular. Hence the start date is of great interest and, together with a variety of other evidence – not least regulatory change in the same period – supports an argument that

[7] ISDA data is presented in Figure 1-2 because it is available for a longer time frame. In the majority of this Chapter the BIS survey is used. The BIS total notional outstanding in 2011 is approximately US$700 trillion compared to just over US$450 trillion from ISDA. The difference lies mainly in their treatment of intra-dealer exposures and centrally cleared derivatives. See ISDA Research Note Number 1 for more details of the differences between the two data sets. (ISDA, 2008)

[8] As is discussed further below this has largely been because of an increase in co-ordinated actions to eliminate offsetting trades between dealers

something qualitatively different began to happen to derivatives trading in the mid-1980s.

1.2.2 Banks

Further examination of the OTC derivatives statistics reveals large international banks at the heart of these markets. This thesis argues that their role in the economy, and indeed their essence, as specialists in creating, sustaining, and profiting from claims to monetary value means that they are equipped with many of the attributes required for making derivatives markets and have shaped these markets in their favour. The theory develops a logic to explain the expansion of bank activities to include first securities and then derivatives dealing.[9]

Contrary to neoclassical economic theory, markets do not naturally spring up from the spontaneous interaction of commodity owners. (Lapavitsas, 2003) They require coordination and infrastructure. With exchange-traded derivatives, some of this is provided by the exchange, with OTC derivatives, banks fill this role. Banks become market-makers in two ways: first, they serve as the central point in the trading of derivatives and 'stand ready to buy and sell' (Levi, 2005: 563) to make prices for the user; and second, they build the market infrastructure.

It is in their standing ready to buy and sell that banks' centrality to these markets is revealed. Banks as derivatives dealers are one counterpart to the overwhelming majority of all OTC derivatives. Returning to the BIS statistics, an examination of the sampling methods used by the BIS, and indeed ISDA, for their surveys reveals the central role of dealers. Subsequent analysis reveals how concentrated this group of dealers is.

The sample methodology used in both surveys polls only dealers; the results therefore rest upon the strong assumption that all OTC derivatives trading faces at least one derivatives dealer, i.e. that the many thousands of derivative end-users never trade with other end-users but are obliged to trade with intermediaries who

[9] Historically, by the mid-1980s investment banks were at the heart of securities markets and this, along with the regulatory environment of the time, was important in placing banks at the centre of burgeoning OTC markets.

form a relatively small and therefore inevitably influential group at the hub of derivatives markets. As ISDA puts it:

> The focus on Primary Members … leaves out active derivatives participants such as hedge funds and government sponsored entities. This should not be a problem, however, because such participants virtually always transact through dealers. Hedge funds do not deal directly with other hedge funds, for example, but through the intermediation of dealers; the same is true of government-sponsored entities such as Fannie Mae or the World Bank. Surveying only dealers should therefore pick up all significant OTC derivatives activity. (ISDA, 2008)

While it is admittedly difficult to test this assumption, it strongly suggests that the vast majority of all OTC derivative transactions pass through the hands of dealer banks.

The BIS survey splits derivatives users into 'reporting dealers', 'other financial institutions' and 'non-financial customers'. A grid showing who is trading with whom can be simplified to one line, as presented in Table 1.2 below. The table shows that not only do dealer-to-dealer transactions account for just less than a third of OTC derivatives volume but, more importantly, that at least one dealer is a counterpart to all OTC derivatives transactions.

Table 1.2: OTC Derivatives nominal outstanding amount by counterparty grouping at June 2011

Counterpart Type	Reporting dealers	Other financial institutions	Non-financial customers
Reporting dealers	US$206tn. 29%	US$401tn. 57%	US$51tn. 7%
Other financial institutions		Assumed negligible	Assumed negligible
Non-financial customers			Assumed negligible

Note that approx 50 trillion USD or 7% of notional outstanding is not allocated to a counterparty type either because it is a commodity derivative or because it represents an adjustment between the semi-annual statistics and the BIS 2010 triennial survey.
Source: (Bank for International Settlements, 2011)

The number of these dealers is small, particularly in relation to the overall number of market participants. Although ISDA lists over 200 primary members, the statistics for the mid-year 2010 survey were compiled from 71 responding institutions in 20 countries (ISDA, 2010b). The BIS surveys central banks and regulators in the G10 countries plus Switzerland; in 2008 the survey was based on data from 57 institutions (ISDA, 2008). There are many thousands of derivatives end-users and such a relatively small number of dealers to intermediate in all trades suggests a high degree of concentration.

In fact the concentration of dealers is even higher than the survey sample size suggests, and it is increasing. Much less than the 50-70 institutions polled by ISDA and the BIS are responsible for the majority of dealer, and therefore derivative, activity. The top 20 of 199 firms accounted for 48% of notional outstanding in 1995 and 67% in 2000 (there were 54 mergers amongst these dealers between 1995 and 2001) (Emm and Gay, 2005: 52). The BIS reports a rising concentration of dealers as measured by Herfindahl index scores, in the vast majority of the categories it measures. (BIS, December 2009)

A more recent snapshot shows that the top 15-20 dealers are one counterpart to an overwhelming majority of OTC notional outstanding. It is estimated that 82% of total notional outstanding in 2010 was held by the fourteen largest derivatives dealers, known as the G14. (ISDA, 2010b). Table 1.3 below shows the notional outstanding of 14 major derivatives dealers (although not exactly the G14) in 2009.[10] Adjusting these numbers to account for the double counting of inter-dealer trades gives a figure that suggests that these 14 dealers account for 70% of notional outstanding (as the adjustment underestimates the contribution of those named and includes ETD business, this figure can be considered broadly consistent with the ISDA figure for the G14).[11]

[10] The list and notional outstanding was drawn up by Fitch Ratings using 10-Q filings in the US at 6 June 2009 and annual reports at Dec 31 2008 for dealers based outside the US.

[11] Outstanding amounts between members of the selected group are counted in both members' contributions, e.g. a trade between UBS and RBS shows in both UBS and RBS returns. The total interdealer notional is therefore subtracted from the total contribution from those names to achieve a better comparison with the total outstanding. This underestimates the contribution of those named, as it included trades with and between all the other dealers in the BIS survey not just those named.

Table 1.3: Derivative Notional Outstanding Amounts for selected large derivatives dealers.

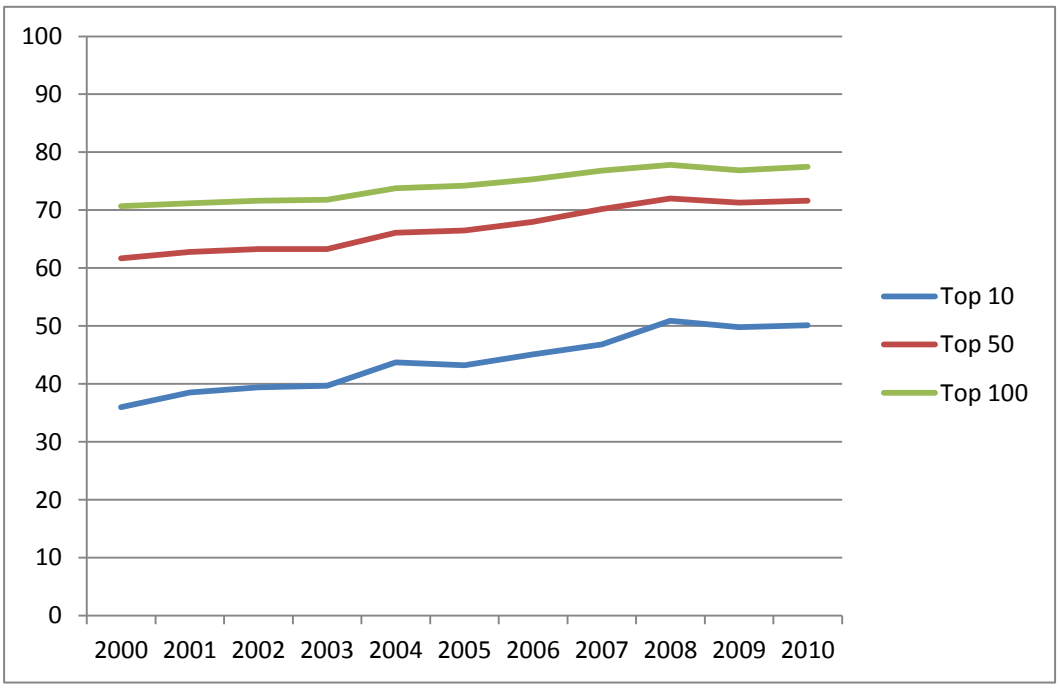
Company	Total Notional (US$ trillions)	
RBS Group	92.7	
JPMorgan Chase and Company	81.7	
Bank of America Corporation	78.0	
Deutsche Bank	70.2	
Barclays	67.1	
BNP Paribas	51.2	
Goldman Sachs Group Inc.	47.8	
Morgan Stanley	39.3	
Credit Suisse	37.9	
Citigroup Inc.	31.5	
UBS	28.4	
Credit Agricole	23.9	
Societe Generale	21.8	
HSBC	17.3	
Subtotal for selected group	689	
BIS InterDealer Notional	(74.2)	
Adjusted total for selected group†		614.8
BIS OTC outstanding	591.6	
BIS ETD outstanding	209.6	
Total outstanding derivatives		876
Approximate % accounted for by selected group		70%

† See footnote 11
Source: (Fitch Ratings, 2009), (Bank for International Settlements, 2011)

Data as at Dec 2008 (non-US firms and BIS aggregates); H1 2009 (US firms)

This increasing concentration amongst derivatives dealers reflects increasing concentration among banks more generally. For example, Figure 1.2, below, shows the recent consolidation among US banking organisations, the largest 10 banking organisations accounted for just over 50% of all banking assets in 2010 an increase from 36% in 2000 (Adams, 2012). The events of 2008/9 have further concentrated activity in derivatives markets with the disappearance of Lehman Brothers (bankrupt) and Bear Stearns, and Merrill Lynch (forced mergers), all three of which were major derivatives dealers (US Treasury 26/10/2008, 20/11/2008).

Figure 1.2: Percentage share of U.S. total banking assets for largest 10, 50 and 100 banking organisations from 2000 to 2010



Source: (Adams, 2012)

The second role that banks as derivatives dealers play as market makers is that they literally 'make' the market by providing the infrastructure. While the exchange provides a physical or electronic trading location and a variety of pre- and post-trade services for ETD, dealer banks tend to provide the corresponding infrastructure for OTC markets. Thus banks compete individually by providing dealing platforms and research,[12] and cooperate to put much of the market infrastructure in place. Although OTC contract design is open to competition,[13] dealers have also cooperated to a great extent to standardise legal documentation,[14] not least through ISDA, the organisation charged with

[12] E.g. UBS Investment Bank (2012)

[13] On an exchange, dealers compete on liquidity and price provision but contracts are centrally designed by the exchange. Partly because dealers, as the biggest customers, have a large say in the affairs of the exchange and partly because the exchange aims to maximise profits by maximising the trading in a new contract dealers might be thought here to collude with respect to contract design (Fehle, 2006). Exchanges do however compete with each other in attempting to design contracts which will attract increased trading volumes (Santos and Scheinkman 2001).

[14] E.g. the European Financial Markets Lawyers Group

coordinating legal matters in the OTC derivatives markets and dominated by the biggest derivatives dealers;[15] dealers cooperate in matters of global derivative regulation such as the Basle Capital Accords, and organise and run clearing houses.[16]

The very same dealer banks are amongst the biggest players in ETD markets. Although statistics are hard to come by, banks are heavily represented at the Futures Industry Association (FIA) in the US, of whose regular members 21 out of 32, or 65%, are banks (FIA), 2011). It is difficult to know what percentage of derivatives activity these banks account for, but as the remaining members are mainly brokers, which generally do not take a position themselves, it is reasonable to suggest that banks account for considerably more than 65% of ETD business. As big customers and clearing members of exchanges, banks are heavily involved in decisions concerning the management of exchanges, e.g. consulting and agreeing on risk-management procedures and margin levels.

The focus on banks highlights another aspect of derivatives, namely that they are a promise to pay or, from the opposite perspective, a claim on another counterpart: 'the parties to a derivatives contract are principally dependent upon each other's creditworthiness to assure future performance' (Bliss and Steigerwald, 2006: 23). This is equally true for derivatives facing a bank or those facing an exchange. On an exchange, various ways of enhancing the credit of the exchange and minimising the size of the credit exposure reduce the importance of the derivative's nature as a claim –perhaps because researchers have physically-settled ETD in mind when analysing the cash-settled OTC derivatives of today this aspect is often underplayed. Derivatives are first and foremost claims between counterparts, but the infrastructure of the market, including assumptions

[15] Originally named the International Swap Dealers Association. Although ISDA boasts 803 members, 209 of these are Primary Members and in fact a smaller group appears to hold more power than others: apart from the executive vice chairman and CEO, the officers and directors are overwhelmingly employed by major derivatives dealers. Officers and directors are drawn from Deutsche Bank, JPMorgan Chase & Co, Morgan Stanley, BNP Paribas, UniCredit, Citi, Société Générale, Goldman, Sachs & Co, the D. E. Shaw Group, PIMCO, Nomura Securities Co., HSBC Bank plc, Standard Chartered Bank, Royal Bank of Scotland, Barclays Capital, Mitsubishi UFJ Morgan Stanley Securities Co., BP, Bank of America Merrill Lynch, UBS AG, BlackRock, RBC Capital Markets and ICBC (ISDA, 2009a)

[16] E.g. of the 20 London Clearing House board members (LCH, 2011), two full-time members were previously long-term employees of JPMorgan and the Bank of England, 15 are employed by international banks, 2 are from other exchanges and only 1 is not a banker.

in academic models, acts to suppress this and to emphasise their nature as tradable instruments. Derivatives might be thought to 'derive their value from the value of the real underlying asset(s)' (McKenzie, 2011: 205), but the underlying 'is a mere index used to determine the winner and loser of the transaction' (McKenzie, 2011: 207). The value is in the winner being able to pay over money to the loser.

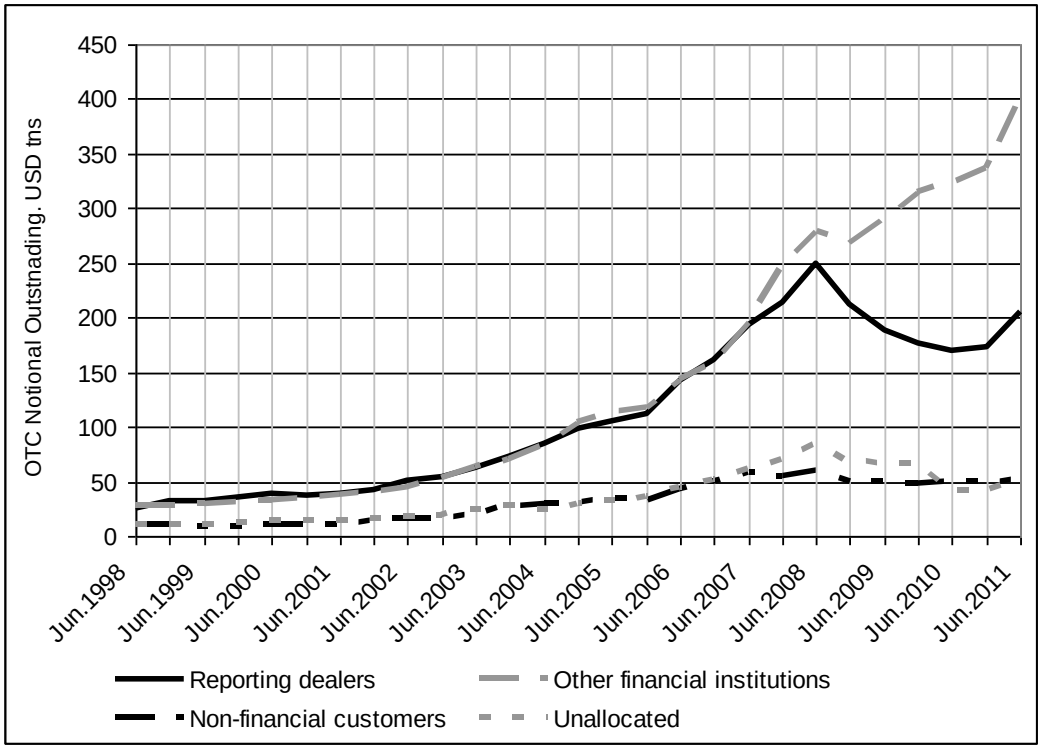
1.2.3 Financial

Perhaps unsurprisingly, the rise in the role of banks in derivatives markets coincides with a rise in financial derivatives as banks apply the technology of derivatives to concentrate on their area of speciality: financial claims. Table 1.3 above showed that the commonest counterpart to a dealer is a non-dealer financial firm and the second most common is another dealer; non-financial firms (always trading with a dealer) make up less than 10% of notional outstanding.[17]

Moving from this snapshot to change over time, Figure 1.3, below, shows how the growth of total notional outstanding has come mainly from financial firms. Figure 1.4 reconfigures the same data to show notional outstanding as a share of the total: the share of non-financials has fallen over the 13 years to 2011, while that of financial firms has risen.

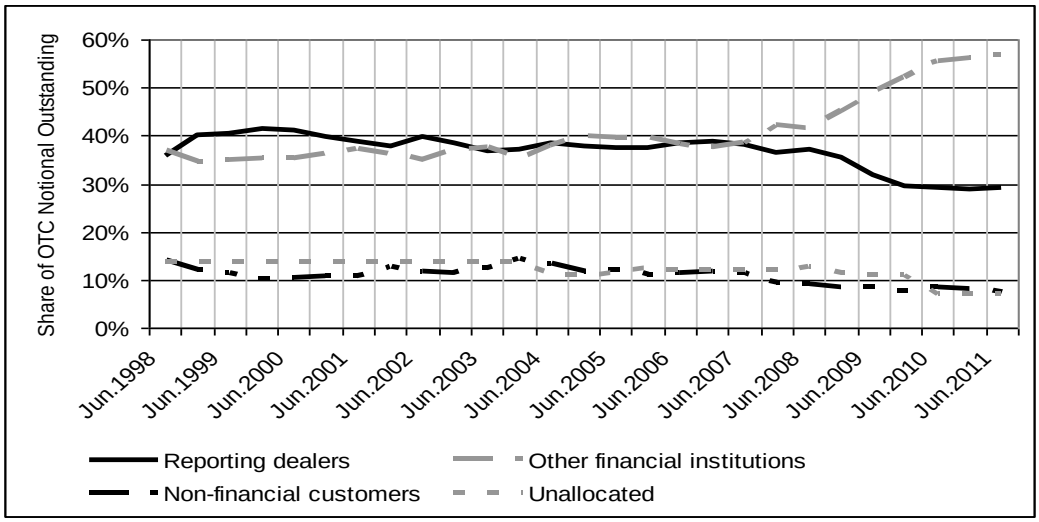
[17] In addition of the share attributed to non-financial firms, a large proportion will consist of swaps accompanying bond issuance. Typically in these cases bond issuance was in a form suited to selling bonds to investors and not in a form suited to the borrower, for example in a different currency than the borrower required. Having issued a bond in a form that did not suit the borrower a swap is then provided to the borrower to convert the coupon payments into the form that the borrower requires. It is highly debatable that this should be considered hedging or active derivative use by borrowers. Additionally this figure will include derivative activity by nominally non-financial firms that are acting in derivatives markets as financial firms.

Figure 1.3: OTC Notional Outstanding by Counterparty Type (BIS) – absolute at June 2011



Source: (Bank for International Settlements, 2011)

Figure 1.4: OTC Notional Outstanding by Counterparty Type (BIS) - % of total at June 2011

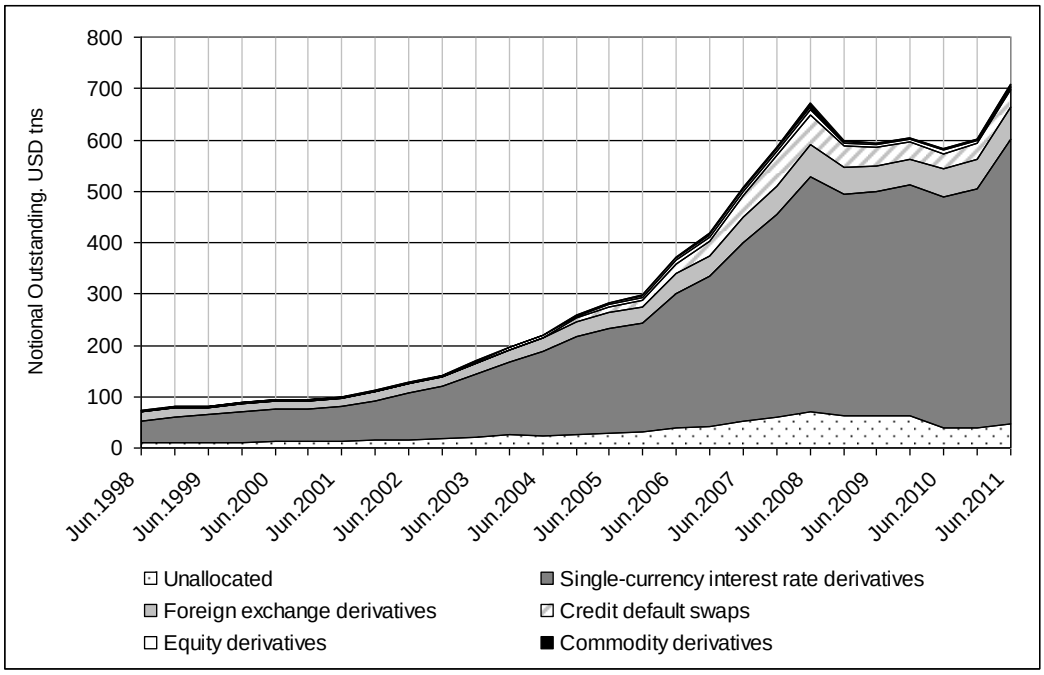


Source: (Bank for International Settlements, 2011)

Both figures show a distinct change with the onset of the financial crisis. There was a slight slowdown in activity in 2008, but the change in composition is probably due in large part to the acceleration among dealers since the crisis of central clearing and trade compression (whereby trades between dealers are submitted to a central agent which searches for and terminates offsetting trades). Central clearing novates interdealer trades to a central clearer; this means a clearing house such as London Clearing House (LCH) steps into a trade between the two dealers and creates a new trade between the clearer and each dealer (LCH.Clearnet, 2012). This has the effect of decreasing the notional outstanding that survey respondents (dealers) report with other dealers and increasing the amount that they report with other financial institutions (i.e. the clearing house). Moreover, while the BIS adjusts for double counting between dealers it does not (yet) adjust for the doubling of notional that accompanies the novation of one trade into two. Second, dealers have also accelerated trade compression. Between year-ends 2007 and 2010, $137 trillion of notional was removed in this way. (ISDA, 2010e) These initiatives were in place for years before the crisis, but accelerated in response to it.

Using the same BIS data but turning from the counterparty group to the instrument type, Figure 1.5 below shows that financial instruments make up an overwhelming majority of OTC derivatives outstanding. Growth over the period has been dominated by IR and currency derivatives, while since the early 2000s credit default swaps (CDS) have also shown spectacular growth.

Figure 1.5: OTC Notional Outstanding by Instrument Type (ISDA) – absolute amounts at June 2011



Source: (Bank for International Settlements, 2011)

Finally, investigation of dealers' profits from OTC derivatives confirms the financial nature of OTC derivatives and associates them with adjusting portfolios of financial claims. Bank's derivatives-dealing profits are impossible to separate from their securities-dealing profits. Although high profits from derivatives dealing are suspected, proof is hard to come by. The profits of financial firms more generally have been rising (from 1970 to 2000 their share of domestic profits in the US rose from 20% to 40% before falling back to 36% in 2006 (U.S. Department of Commerce, 2009)). Among financial firms, banks' profits as a share of GDP seem have been rising in several advanced economies (dos Santos, 2009).

Within bank profits, however, it is difficult to isolate those from derivatives. Derivatives are used in many aspects of bank business; however dealer banks typically trade derivatives and securities together in the same organisational entities, e.g. fixed income currency and commodities (UBS AG, 2011: 102). As a result, reporting tends to mix together money markets, securities trading and derivatives trading. For example, while Office of the Comptroller of the Currency (OCC) disclosure provides trading revenue for the top five commercial banks and

trust companies in derivatives, the revenues are for derivatives and 'cash instruments' (i.e. loans and deposits and securities) combined, as shown in Table 1.4 below for the second quarter 2011.

Table 1.4: Trading Revenues from Cash Instruments and Derivatives, Top 5 Commercial Banks and Trust Companies in Derivatives at June 2011

	Total Assets (USD)	Total Derivatives (USD)	Total trading revenue from cash and off balance sheet revenues.† (USD)
JPMorgan Chase Bank NA	1.8 tn	78.1 tn	3.021 billion
Citibank National Assn	1.2 tn	56.1 tn	1.580 billion
Bank of America NA	1.5 tn	53.2 tn	0.883 billion
Goldman Sachs Bank USA	0.1 tn	47.7 tn	0.636 billion
HSBC Bank USA National Assn	0.2 tn	3.9 tn	0.167 billion

†Revenue figures are for the quarter (not year-to-date)
Source: (Office of the Comptroller of the Currency, 2011: Table 7)

While banks made large losses on proprietary positions at the outset of the financial crisis that began in 2007/8, the daily business of making markets in derivatives is reported to have remained profitable. This profitability was underpinned by a number of factors: increased volatility led to wider bid-ask margins for dealers; mergers and bankruptcies reduced competition; and large moves in markets generally led to increased activity as market participants sought new opportunities and closed out old ones (Leising and Hester, 2009, Mackenzie, 2009).

While it is difficult to draw clear conclusions from the profitability data itself, perhaps the most important lesson is that securities and derivatives trading are presented as one activity. Banks report these activities together because this is how their activities are organised. Even individual traders frequently combine securities and derivatives activities (Beunza and Stark, 2004). Instead of starting with derivatives as a method by which producers could fix future prices, it would be better for analysis to consider derivatives in light of their connection to securities trading.

The interconnectedness of securities and derivatives anticipates the discussion of the nature of derivatives below. Here I argue that instead of fixing a future price, derivatives are one among several different ways of adjusting inventory. As

securities derive their liquidity from exchange for money in a market, resulting in moving prices, securities owners face moving prices and hence a moving value of their portfolio. In the face of this they attempt to preserve and increase the value of their portfolio by buying and selling. Buying and selling the securities themselves is one way of achieving this, and buying and selling using derivatives is another. Portfolio owners choose the method they hope will best conserve or increase the value of their portfolio, capturing price moves in securities or in derivatives or between the two. Banks, as dealers in both markets, stand ready to buy and sell at different prices, profiting from the increased trading activity and providing the market infrastructure.

1.3 **The nature of derivatives**

As well as examining the size, growth and overwhelmingly financial character of derivatives it is necessary to explore their nature and purpose a little more. This section first compares the exchange of commodities for money with the mechanisms of physically-settled derivatives and then compares physically-settled and cash-settled derivatives. This analysis reveals the nature of the derivative as a claim that enables a much greater scale and scope of trading than is possible or practical when exchanging the underlying for money. Trading here means repeated buying and selling to profit from changes in price.

1.3.1 Exchange-traded physically-settled derivatives

Textbook accounts of derivatives often treat them as a way to trade an underlying commodity. Such an analysis of the similarities between derivatives and tradin in the underlying can be instructive, but it is analysis of the differences that most helps to reveal what is distinctive about the derivative form.

Prior to the 1980s the best-known and most-traded derivatives markets were the agricultural commodities markets of North America, which were characterised by exchange-traded and physically-settled derivatives. Textbook accounts of derivatives often look back to these forms as typical and perhaps because of this they treat derivatives as a way of trading an underlying commodity. These definitions often discuss derivatives as means of fixing future prices for producers, e.g.:

> A derivative is a contract which gives one party a claim on an underlying asset, or cash value of the asset, at some fixed date in the future. The other party is bound by the contract to meet the corresponding liability. A derivative is a contingent instrument because it consists of a version of well-established financial instruments (for example, currencies) or commodities (for example, wheat). Derivatives give both parties more flexibility than the exchange of the underlying asset or commodity, because they are sold in well established markets. …
>
> Consider the case of the pig farmer who knows that in six months time he/she will have a quantity of pork bellies to sell. The farmer wishes to hedge against the fluctuation in pork belly prices over this period. He/she can do so by selling (going short) a six month 'future' in pork bellies. The future will consist of a standard amount of pork bellies, to be exchanged in six months time, at an agreed fixed price on the day the future is sold. The agent buying the pork belly future *goes long*, and is contractually bound to purchase the pork bellies in six months time. … The underlying or 'basic' commodity is pork bellies; the futures contract is the contingent claim. .... The future increases the flexibility of the market because it is sold on an established market.
>
> (Heffernan, 1996: 172)

This approach has its roots in the neoclassical orthodoxy and allocational efficiency of complete markets, most famously laid out by Arrow & Debreu (1954).[18] According to this theory, being able to transact in the future reduces uncertainty and thereby increases the utility of risk-averse derivatives users (Copeland and Weston, 1988). Derivatives are explained as a cheaper form of the primitive securities that feature in standard accounts of efficient markets (Ross, 1976).

[18] As Wigan (2009: 157, 2008: 13) notes, the analysis of derivatives has tended to split into a 'dominant dichotomy between functional and dysfunctional', with orthodox analysis falling firmly into the functional.

This definition, however, raises questions that can form the starting point for analysis. Perhaps above all the question must be asked why the pig farmer needs a new instrument, i.e. a derivative, by which to sell his produce. The agent buying the pork belly future might be a food producer who would also want to hedge against the fluctuation in pork belly prices over this period. Why would the buyer and seller of agricultural produce not simply agree to a fixed price for future delivery of the farmer's product, as indeed a large share of farmers and purchasers in advanced capitalist states do?[19] The answer that the derivative 'increases the flexibility of the market' because it is an 'established market' tells us little.

Contrary to the implication of this and other similar definitions, selling the actual inventory is not the same as selling forward via a derivative. The farmer has several possible ways in which she could adjust her inventory, including: waiting until the physical commodity is ready to take to market; agreeing fixed price contracts with buyers for her specific produce; or selling via a variety of derivative products. (Working, 1953)

What is needed here is a theory that asks not why firms hedge with derivatives (Judge, 2006) but why someone with an inventory would choose to engage in derivatives trading instead of selling their inventory? Put another way, why hedge with a derivative when one can sell the asset which underlies the derivative? And if it is not possible to sell the underlying, what is it about the derivative that allows it to be sold or perhaps allows the farmer to act as if it has been sold? Neoclassical theory starts by assuming that selling commodities and selling via a derivative are synonymous; however, while the similarities between the two are important it is the differences that reveal more about the nature of derivatives and lead to investigation of the consequences of these differences.

To establish the difference between selling a commodity directly and selling via a derivative it is necessary to look more closely at the derivative. In a physically-settled derivative the underlying is already an 'homogenous abstraction' (Cronon, 1991: 132, cited in MacKenzie, 2006: 14) from a particular commodity; it is a

[19] In the USA 'the share of aggregate farm production under contract has stabilised at around 40 percent'. (O'Donoghue et al., 2011: 25)

more general idea of pork bellies than the pork bellies of a particular farmer. The definition of a derivative above talks of a standard quantity but omits to mention that exchange-traded derivatives are also refer to a standard *quality* of produce. The agricultural produce to which commodity derivatives refer is graded and pooled with produce from many farmers, making one farmer's output indistinguishable from that of others.[20] Thus the agent buying the pork belly future will probably not take possession of the pork bellies of the pig farmer they trade the future with. The future is on a standard quantity of a standard quality, and not the produce of a single farmer.

The point is underlined by considering that before farmers' produce was pooled to travel to market, individual farmers needed to insure their specific crop for the journey. However, the need for and indeed possibility of insurance disappears once produce is pooled and the farmer's specific crop cannot be identified (Cronon 1991: 108). At this point, when insurance is no longer possible, the derivative becomes possible.

As further explored in Chapter 7, it might be argued that what is being sold is not *the* ton of grain of a particular farmer but *a* ton of grain; a nonspecific rather than a specific ton of grain. As I will show, cash-settled derivatives take the concept of the underlying to which the derivative refers as a purely social construct even further, fully allowing traders to act only *as if* they were buying and selling the underlying.

This abstraction from the farmer's actual produce creates a basis risk for the producer. Strictly speaking, basis risk is 'the difference between the futures price and the spot price', although 'usage of the word basis is somewhat loose' and in practice the term is sometimes used to describe differences in any related prices. (Bodie et al., 2005: 805) With agricultural commodities, for example, losses can result if the quality of the farmers produce and differs from the quality to be delivered into the future (Working, 1953: 325). For example, if the farmer sells via a future specifying a certain quality of grain but her produce turns out not to

[20] For example, wheat futures were made possible when grain elevators which stored larger quantities of grain and pooled farmers produce were introduced and when inspections by reputable agents to grade the grain were introduced. (Cronon, 1991: Ch.3, MacKenzie, 2006)

meet the specified quality, she must sell the lower-quality commodity into the market as best she can, because it is not deliverable into the derivative, and must also purchase commodities of the required quality to honour her obligation to deliver into the derivative.

So for the holder of an inventory, such as a farmer with commodities to bring to market, selling the inventory today or fixing a price for future delivery are qualitatively different from entering a derivative based on similar commodities. When a commodity is sold a definite and particular commodity is exchanged for money, whether for immediate exchange or for settlement at a later date. When a sale takes place via a physically-settled derivative there is an agreement to enter into a commodity sale in the future, but the agreement covers not a specific, particular commodity but a commodity fitting certain criteria, creating the possibility, among other things, that the commodity the seller produces does not fit the criteria specified in the derivative agreement.

If derivatives are qualitatively different from commodities, what might be the motivation for using derivatives instead of selling the commodity itself? Working (1953) studied wheat farmers in America's Pacific Northwest. When choosing futures contracts these farmers could choose between the closer Seattle exchange, which traded contracts on the soft wheat that they grew in the Northwest or the Chicago exchange, which traded futures contracts on hard wheat. He found that they preferred the Chicago contract despite the additional basis risk incurred because it was much more heavily traded than the Seattle contract meaning when the farmers wished to trade it was easier and quicker to do so. When using derivatives the farmers valued the ability to buy and sell easily.[21] Derivatives were not for selling their produce but for repeated buying and selling to capture price moves, which in this thesis is referred to as trading.[22]

[21] Note that this conclusion is somewhat *contra* Working's interpretation of his investigations.

[22] Working's study also highlights that the notions of hedger, speculator and arbitrager (e.g. Kaldor, 1940) are misleading when considering the holder of an inventory facing several ways to preserve or enhance the value of the inventory through exchange. These categories, and hedging in particular, seem to stem more from neoclassical theory than from the choices facing a holder of inventory. Working found that farmers made informed guesses about current and future prices (speculating) and if, for example, they felt prices would fall they decided amongst various ways (arbitrage) of selling now at those prices (hedging). The three categories are inseparable in the decision of how and when to buy and sell.

Looking again at the design of the derivative contract compared to the exchange of specific commodities it becomes clearer that the design of the instruments increases the ease of and possibilities for buying and selling. By pushing delivery into the future, a derivatives trader can buy without needing to take possession of the commodity before selling again. This is eased by the standardisation of the underlying, discussed above, as traders can be assured that a purchase and a sale are in commodities of the same quality and quantity, so there is no need to inspect bought and sold commodities. Additionally, standardisation of the derivative contract itself via standard expiry and delivery dates allows derivative contracts to be offset, lowering the due diligence required on each additional derivative contract. It also allows offsetting purchases and sales to be terminated and any profits or losses to be settled purely with money, allowing a much greater amount of derivative trading for a given amount of money to settle profits and losses.

The processes typically used organised derivatives exchanges such as London International Financial Futures and Options Exchange (LIFFE) illustrate these points. These exchanges increase profits by increasing trading volumes. First, derivatives exchanges design standardised contracts in standardised underlying reference price indices. (Bartram and Fehle, 2003) Second, the exchange steps between the buyer and seller and novates the contracts. Novation is the cancellation of the original contract between buyer and seller replacing it with two contracts, one between the buyer and the exchange and one between the seller and the exchange. If either buyer or seller go on to engage in an offsetting sell or buy with another counterpart, these are also novated by the exchange. This allows the exchange to cancel offsetting buys and sells that a user has made regardless of who the original counterpart was. (Bliss and Steigerwald, 2006) As a result there is no need for physical delivery, and gains or losses from buying and selling derivatives at different prices are settled purely in money. In fact for the vast majority of exchange-traded derivatives contracts in which the underlying is a deliverable asset, there is no actual physical delivery upon the expiration of the contract. (Lynch, 2011a: 26)

Third, and interlinked, the exchange asks for cash collateral against outstanding or open trades in a process known as margining. This protects the exchange

against credit risk and means that user's profits from price moves are recognised in cash immediately. Note that margining can create additional basis problems for a farmer hedging with derivatives; e.g. when prices are rising, a sell via a future loses money and requires a cash margin, which in theory is offset by price rises in her actual produce; however, until this produce is exchanged for money the farmer must find other sources of money to fund margin payments.

In short, the comparison of physically-settled derivatives and commodities suggests that there is a qualitative difference between commodity exchange and trading with derivatives, and in particular between a particular and exchangeable commodity and the underlying to which a physically-settled derivative refers.[23] Moreover, in the physically-settled derivative can be seen the seeds of the more-developed form, cash-settled financial derivatives, which dominate derivatives markets in the early 21st century. As long as physical delivery remains a possibility, the derivative form remains hobbled, and linked to the underlying commodity. Once derivatives contracts are settled only with money in a cash-settlement the restraints of the commodity world are removed and derivatives take on some of the limitless nature that is also associated with money.

1.3.2 Cash Settlement

The analysis turns now to the comparison of physically-settled and cash-settled derivatives. The difference between a cash-margined physically-settled future and cash settlement may appear small but it represents a qualitative change. Cash-settled derivatives are the most developed form of derivatives and have a central place in analysis. Cash settlement sets derivatives free from the possibility that delivery of the underlying will be required. This allows trading via derivatives in *quantities* that could not practically be delivered; and it allows trading on *things* that could not practically be delivered, and even on things that could never possibly be delivered. Cash settlement, therefore, creates the possibility of the vast increases in the scale and scope of derivatives, fuelled by repeated trading to capture price moves, that we have seen over the last 30 years. (McKenzie, 2011: 207)

[23] A further manifestation of the differences can be seen in the way that legal contracts to sell specific produce do not acquire a price and an exchange value, as derivatives do.

The first S&P 500 futures contract was a landmark moment and rested on the change in the legal status of the cash settlement to a legitimate investment practice. (MacKenzie, 2006: 172) In both the US and the UK, cash-settled derivatives were seen as gambling prior to the 1980s. In the US this rendered them illegal in many states; in the UK it made the contracts unenforceable. In both countries, in different ways, the law was changed to allow derivatives . In the UK the Financial Services Act of 1986 (legislation.gov.uk, 1986) simply ruled that business considered investment business under the Act could not be rendered void or unenforceable. (MacKenzie, 2007: 20)

In the US, Congress voted into law the Shad-Johnson Accord in 1982, which effectively legalised cash-settled derivatives. The Accord circumvented the anti-gambling laws of individual states by placing the regulation of cash-settled derivatives under the federally-constituted Commodity Futures Trading Commission (CTFC), there being no federal ban on wagering. The Chicago Mercantile Exchange had supported the creation of the CFTC in 1974, and it was the CFTC that gave dealers the capacity to trade cash-settled derivatives – it was not possible to do so under either Illinois state law or the auspices of the Securities Exchange Commission (SEC) (MacKenzie, 2006: 170-172, Millo, 2007).[24] As a result of the ruling on April 21st 1982, the Mercantile Exchange in Chicago launched its S&P index futures contract.

Perhaps the clearest example of a cash-settled derivative is a contract for differences (CFD). 'A CFD is simply an agreement between two parties … to pay each other the change in the price of an underlying asset. Depending on which way the price moves, one party pays the other the difference from the time the

[24] Regulatory oversight of derivatives in the US is complex; e.g. 'The jurisdictional agreement, commonly referred to as the "Shad-Johnson Accord" was passed into law as part of both the Securities Acts Amendments of 1982 and the Futures Trading Act of 1982. See P.L. No. 97-303; 96 Stat. 1409 (1982) and 97-444; 96 Stat. 2294 (1982). Under the Shad-Johnson Accord the CFTC retained exclusive jurisdiction over all futures contracts, including futures contracts on stock indices and options on futures contracts and physical commodities. The SEC, however, was given a special consultative and concurrent role in the approval process concerning stock index futures contracts … Under the Accord, the SEC also retained jurisdiction over securities, including options on securities (including exempted securities), options on certificates of deposit, options on stock indices, and options on foreign currency traded on a national securities exchange. Futures contracts on individual securities, other than exempted securities, are prohibited.' (U.S. Securities and Exchange Commision (SEC), 1997)

contract was agreed to the point where it ends' (lexicon.ft.com). Simply put, if it goes up, you pay me; if it goes down, I pay you.[25]

Because the possibility of an exchange of an asset for money at expiry is explicitly excluded, the underlying to a cash-settled derivative must be socially constructed even more clearly than in the case of physically-settled derivatives. The parties to the derivative must agree on a metric that will serve as the price of the underlying and can be used to determine the cash payment due (in contrast to a physical settlement, where at expiry a specified amount of money can actually be exchanged for a specified quality and quality of commodity).

Both parties must be confident that the metric used as the underlying reference price for the derivative is free from manipulation by the other party. (MacKenzie, 2007) Sometimes the metric is a non-market measurement in which market participants have faith such as an amount of rainfall in a specified, published by meteorological offices or even sports outcomes.[26] Often, however, the underlying reference index (the price of the underlying) is itself a market price. (Toporowski, 2000: 108) Prices in the underlying market must be collected and transformed, e.g. by averaging, into an index of 'market' price. These prices can be observed, or in the case of London Interbank Offered Rate (LIBOR) are estimates of where trades might occur (British Bankers Association (BBA)).

The result is a financial instrument intended for trading to capture price changes and not for exchange. While the analysis of physically-settled derivatives above remains somewhat concerned with exchanging a commodity for money and fixing the price, CFDs and cash-settled derivatives are more clearly about trading, usually excluding the very possibility of exchange. The derivative user aims to start and finish with money *as if* they have bought and sold – and to do so

[25] The UK's Financial Services Authority (FSA) defines a CFD as follows: 'A CfD on a share is a derivative product that gives the holder an economic exposure, which can be long or short, to the change in price of a specific share over the life of the contract. Contracts are normally open-ended, and can be closed out by the CfD holder on demand. The contract does not give the holder either ownership of the referenced shares or any ownership rights, such as voting rights. Nor, since the contract is normally cash-settled, does it usually create any right to take delivery of the shares in place of cash settlement.' (Financial Services Authority, 2007: 11)

[26] Eatwell and Taylor (2000:101) report a bond issued by a Salt Lake City bank which paid a coupon that was determined by the 'number of victories by the Utah Jazz basketball team'. (Eatwell and Taylor, 2000)

repeatedly, as I will show, rather than starting or finishing with a commodity or a financial instrument.[27]

It is worth further exploring the nature of derivatives as instruments for repeated buying and selling to capture price moves. Toporowski (2000: 96) argues that derivatives are being used for hedging if 'an uncertain parameter is fixed enabling a profit from some underlying to be calculated with less uncertainty'. Let S_{t+x} equal the spot price, i.e. the price to exchange money for commodities immediately, executed at time t+x. This price is fixed and known in the current and previous period (i.e. on completed transactions) but both volatile and unpredictable in the next period. Let F_{t+x} be the price of a forward, executed at time t+*x* to buy/sell the same asset for settlement or exchange one period later. As above, F_{t+0} is known and fixed (todays price for forward exchange) but F_{t+1} is not (tomorrow's price for forward delivery). The reduction of uncertainty that Toporowski describes can be seen in the difference between a volatile profit given without hedging, i.e. by buying at the current known and fixed price and selling at an unknown one in the future:

$$\pi = -S_{t+0} + S_{t+1}$$

and a fixed profit given by selling forward (both prices are fixed):

$$\pi = -S_{t+0} + F_{t+0}$$

If on the other hand 'profit depends on the difference between the fixed financial parameter and its uncertain value in the future', derivatives are being traded for a profit[28] (Toporowski, 2000: 96). The latter could easily be a description of a CFD

[27] Talking about the activities of Wall Street investment banks Gowan notes that: 'Trading activity here does not mean long-term investment, Warren Buffet style, in this or that security, but buying and selling financial and real assets to exploit – not least by generating – price differences and price shifts.' (Gowan, 2009: 9) Derivatives are suited to this repeated buying and selling to capture price moves.

[28] Toporowski continues: 'Such differences are likely to be even more volatile than the parameter itself. In other words where financial futures are used for investment the profit is not made more certain but may be less so'. And further that the Basel Accords' Capital Requirements on derivatives are 'implicit recognition that [derivatives] do not create greater certainty'. His analysis sits within a tradition of heterodox political economy (e.g. Minskyan, Marxist) of inherent systemic instability and in a similar vein derivatives have been defined as 'weapons of mass destruction' (Buffet, 2002); part of 'mad money' (Strange, 1998) and associated with 'casino capitalism' (McKenzie, 2011, Strange, 1986). Heterodox treatment of derivatives tends to form a dysfunctional view of them (Wigan, 2009: 157, 2008: 13).

– a price is fixed now and trading profit depends on where the spot market price is at the expiry of the derivative. In this case only one parameter is fixed, and as a result the profit is uncertain:

$$\pi = +F_{t+0} - S_{t+1}$$

Analysing a single trade in this way however does not go far enough. Trading for profit rarely involves waiting simply for the end of the contract to calculate the profit, as when waiting for the results of a horse race. Rather it involves buying and selling in an attempt to lock in a profit. It involves starting with money, buying and selling, and hopefully finishing with more money. Cash-settled derivatives, which dispense with the problems of actually taking possession of the underlying asset, are suited to this trading for profit.[29] In Toporowski's terms, traders are looking for the profit available between today's fixed financial parameter and the uncertain but equally fixed financial parameter of the next moment, i.e. the price of the derivative today and its unknown price in the next period. Here the (again uncertain) profit would be given by:

$$\pi = -F_{t+0} + F_{t+1}$$

There is a very large body of both academic and practitioner literature dedicated to mathematical derivative valuation models which purport to calculate the price of derivative contracts. The amount of this literature supports the idea that the changing price of the derivative before expiry is key, because the intention is to trade the derivative and not to hold it. Perhaps the most referred-to book in this literature is Hull's multi-edition *Options Futures and Other Derivatives*, which is used both in universities and on trading floors. Here derivatives are defined as 'an instrument whose price depends on, or is derived from, the price of another asset'[30] (Hull, 2003: 704). Even accepting that 'much of [the] book is concerned

[29] The FT's lexicon notes that: 'CFDs give you the advantages of owning shares without many of the inconveniences' (lexicon.ft.com), while contracts-for-difference.com states: 'CFDs are not suitable for 'buy and forget' trading or long-term positions' and '[c]ontracts for difference provide an excellent vehicle for short term trading strategies and are the preferred vehicle amongst hedge funds and professional traders'. The FSA's list of reasons for trading in CFDs also suggests CFDs are used for trading and not for take-and-hold positions (Financial Services Authority, 2007: 12).

[30] The price of 'another asset' is sometimes referred to as the reference price or underlying price and the asset itself as the reference or underlying asset. I explore how while there must be a reference price, the idea of a reference asset is more complex.

with the valuation of derivatives' (Hull, 2003: 15), this is a very peculiar way of defining something. One is unlikely to define a tree or a chair, or even a stock or a bond, purely by reference to the way its price is set and not, for example, to its colour, its smell, its use, its mechanics and so on. On the other hand it is also revealing. Derivatives, it seems, are about creating a price that can be traded upon.[31]

'Cash settlement has profound … effects on financial markets' (McKenzie, 2011: 207), but analysis must be careful not to overemphasise the break between the forms of cash and physical settlement, as a result overburdening the change of form, wrongly making it determinate in a move from hedging to speculation. It can be argued that it is the move to cash settlement that decisively increases leverage (allowing new parties to participate in derivatives markets (Das, 2010)), and that is to blame for a shift from hedging to speculative behaviour in derivatives markets (McKenzie, 2011). While the underlying to a cash-settlement is clearly a social construction, as discussed above, this is also true of physically-settled derivatives. Moreover there has been a rise in speculative behaviour in physically-settled markets (G20 Study Group on Commodities, 2011). The move to cash settlement is a qualitative and critical one and there have been fundamental changes in derivatives markets, yet these changes have occurred among a variety of interacting processes which must be incorporated into the analysis.

In short, the nature of derivatives, which I have begun to explore here, is qualitatively different from the exchange of commodities and as a result it is not clear that the categories 'hedger' 'speculator' and 'arbitrager' are particularly useful when analysing derivatives. The question that arises is: what then is the use of derivatives? The tentative answer provided here has been as instruments suited to trading, i.e. for repeated buying and selling to capture price moves. The roots of this nature exist in physically-settled derivatives, but cash settlement seems to mark a qualitative change that allows this behaviour to flourish. This

[31] Even if the scale of the derivative valuation literature and Hull's definition point to the centrality of price almost to the exclusion of everything else, it also raises the question of why a multiple-edition best-selling book and a vast body of academic and mathematical literature is required to find the price in markets that are highly traded. I return to this subject in Chapter 8.

thesis aims to provide the theoretical framework within which such changes occur. Before turning to that theoretical framework, the next section briefly helps to further illustrate the main points made so far by examining some features of credit markets and interest rate swaps.

1.4 Interest rate swaps and credit derivatives

Figure 1.5 above showed that single currency interest rate derivatives are the largest category of derivatives instruments, while credit derivatives in the form of credit default swaps (CDS) have shown extremely fast growth since the mid-2000s. A closer examination of interest rate swaps, the foundation instrument in interest rate markets, and of credit derivatives, of which CDS have become the basic instrument, can help to underline some of the points made in the sections above regarding the nature and growth of derivatives markets over the last 30 to 40 years.

In particular, a brief look at interest rate swaps illustrates much about the nature of derivatives as a claim used for trading, and picks up some of the contradictions of this form. A look at the evolution of the credit derivatives market illustrates how it has grown and how its character has altered with this growth.

1.4.1 Interest rate swaps

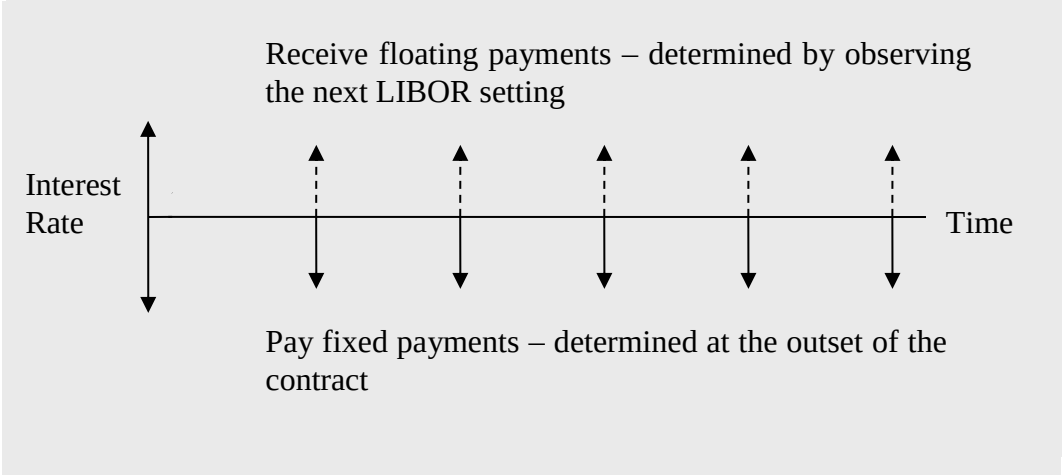
As discussed above, the majority of outstanding OTC notional and the majority of its growth over the last 25 years has come from single currency interest rate derivatives. The commonest and the most typical of these is the interest rate swap: ‘an exchange of a fixed rate of interest on a certain notional principal for a floating rate of interest on the same notional principal’ (Hull, 2003: 707). Each party has a claim to a stream of payments from the other, known as the fixed and float ‘legs’.

Figure 1.6, below, illustrates a swap. Interest rates are depicted on the y-axis, time on the x-axis. Floating rate payments, depicted with a dashed arrow, are here being received (arrows pointing upwards); the fixed leg is paid (solid arrows pointing down). Payment dates are specified in the derivative contract and are

typically regular, although fixed and floating legs may not have the same regularity. Once the last payment date is passed, the derivative ceases to exist and therefore has no value.

The floating rate is reset periodically so that the next payment is known but the payments after that are subject to change and can only be estimated from the current level of a benchmark interest rate such as LIBOR. For example, the swap in Figure 1.6 below might be receiving LIBOR 'flat' (i.e. with no additional fixed spread element) vs. a fixed payment of 5%.

Figure 1.6: Single Interest Rate Swap Illustration



The most common and indeed most infamous interest rate benchmarks used for setting the float rate on interest rate swaps are LIBOR rates. Even a brief analysis shows that this is not a price in the usual sense;[32] it acts as the price of the underlying to the derivative but cannot be bought and sold except via derivatives. It is more accurately a measurement, an index used by the derivative to determine the payments between counterparts. LIBOR rates are an average, excluding outliers, of a daily survey, of the rate at which banks say that they think they can borrow from each other for a range of given maturities|. No transaction needs to have occurred at the rates that each bank submits (BBA, MacKenzie, 2008). It is a measurement by banks for banks which takes on an objectivity and which, in doing so, aids them in trading derivatives. Moreover, established as fact largely

[32] E.g. 'the amount of money or goods for which a thing is bought or sold' (Tulloch, 1995).

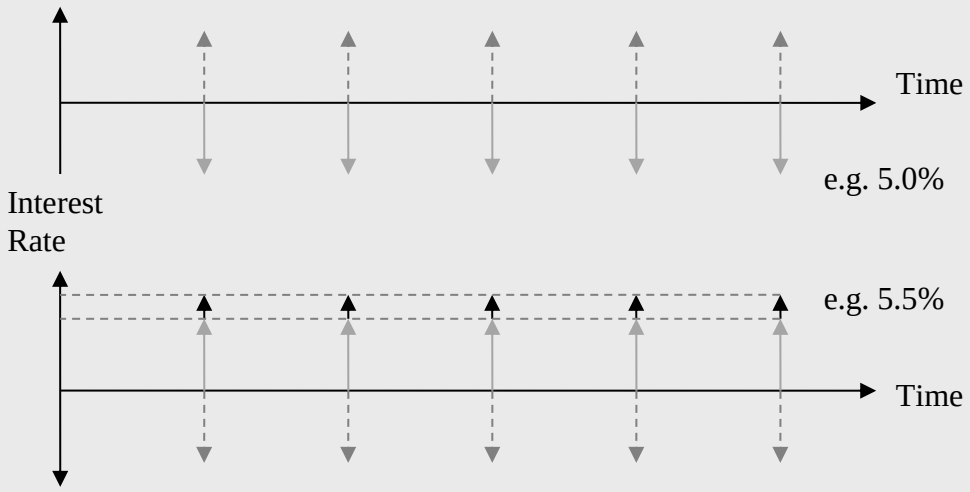
because of banks' ability to trade LIBOR using swaps, it has come to be used as a reference interest rate right across the economy.

The current value of the swap is calculated by finding the net present value (NPV) of all the known and predicted cash flows (predicted using the current level of the benchmark). Usually at the inception of the swap the NPV is close to zero, although the bank providing the swap will typically start with a small positive NPV by way of payment (a negative NPV for the client). The swap may be structured to pay exactly LIBOR vs. a fixed rate calculated from the current structure of interest rates and the required initial NPV. Alternatively the fixed rate can be set first and then payments on the float leg can be set as equal to LIBOR plus or minus a fixed spread calculated from current interest rates.

If interest rates increase, the NPV of the swap for the receiver of floating rates also increases because the additional payments that this generates more than outweigh the effect of increased discounting.[33] At this point the receiver of the floating rate might want to lock in his gain. To do so he must trade another swap, with the same counterpart or with another. In this new swap they might pay a floating rate, e.g. as determined periodically by LIBOR, and receive a fixed rate (i.e. the opposite of the first swap). Therefore across both swaps the pay and receive LIBOR legs will cancel each other out. Because interest rates have moved up, the fixed rate they receive on the new swap will be higher than the fixed rate they paid on the original. Therefore once all payments are netted they will have locked in a fixed stream of future payments which will have a positive NPV. This is depicted in Figure 1.7 below, where netted cash flows are in grey and incremental flows are in black.

[33] Take the simple case of one fixed and one floating cash flow paid on the same date and therefore discounted at the same rate. An increase in interest rates affects the discount rate for both equally. On the other hand, an increase in interest rates increases the payment to the float leg. The NPV of the swap must increase by the increased payment to the float leg discounted at the new rate – however high the discount rate, this cannot be negative.

Figure 1.7: Illustration of Offsetting Interest Rate Swaps



An offsetting second swap (lower) provides cashflows equal and opposite to the first swap (upper). If interest rates have moved in the time between the two transactions the trading counterpart is set to receive an additional series of cash flows over time (shown in black e.g. 0.5%).

Interest rate swaps provide a useful illustration of how derivatives work in advanced contemporary finance. By valuing fixed and contingent future cash flows today, derivatives users can trade derivatives to lock in profits from movements in a measure devised expressly for that purpose. These measures are overwhelmingly based on financial metrics, with banks at the heart of the matter. While the derivative has value today, in this way the payments are by definition future payments, and the value of the derivative depends on those payments being made. The derivative instrument being traded is and remains a claim. As I will show, various measures such as cash margining and collateralisation emerge to render these future payments more secure and hence more tradable.

In short, swaps are typical of derivatives in that they are i) a claim on a counterpart for future cash flows; which are ii) determined by an index agreed on by the market participants. Once those future cash flows are paid, the derivative ceases to exist and has no residual value; iii) market participants tend to treat

these future cash flows as if they are realised by valuing them at today's market value; iv) amongst other things this allows them to treat the future cash flows as tradable, and they trade more derivatives to capture price moves.

1.4.2 Credit Derivatives

Credit derivatives have enjoyed rapid growth, particularly since the mid-1990s, and the development of the market in many ways reflects the development of derivatives markets in general. There is a wide variety of different credit derivatives, from those associated with securitisations that were so prominent in the early stages of the financial crisis which began in 2007/8, to CDS on single corporates, on indices and on sovereigns, to highly structured vehicles such as Constant Proportion Debt Obligations (CPDOs).[34] Of more interest here than the structure of particular credit derivatives, however, is the evolution of the credit market, which in many ways reflects some of the broader trends in derivatives that are the subject of this thesis, most notably how they have emerged as trading instruments *par excellence*.

The evolution of credit derivatives can be divided into the five stages by which they have moved from being occasional instruments by which banks laid off risk to a US$30 trillion market for trading credit price (BIS, 2011). The first three stages begin in the late 1980s and ended in 2003, by which time CDS has emerged as the dominant instrument and credit markets and instruments have changed from a way of achieving one-off credit risk transfer to a way of actively trading (Smithson, 2003). The fourth stage consolidated CDS' status as a trading instrument as the terms were standardised (Mengle, 2007). This analysis has been extended here by adding a fifth stage starting in 2009, when cash settlement was introduced (ISDA, 2009a, 2009b).

The first stage, from approximately the late 1980s to the early '90s, was a defensive and ad hoc stage. Banks looked for one-off opportunities to lay off credit risk; credit derivative instruments were limited in type, experimental and ad hoc (Smithson, 2003). The second stage, from approximately 1991 to the late

[34] As one paper notes: 'In its complexity and its vulnerability to market volatility, the CPDO might be viewed as the poster child for the excesses of financial engineering in the credit market.' (Gordy and Willemann, 2010: 1)

’90s, involved the emergence of dealers using derivatives to pass credit risk on a more systematic basis to a set of end investors (ibid). Early examples of instruments were total return swaps (TRSs) and n^{th} to default baskets.[35] These were followed by synthetic securitisations of assets that traditionally would have remained on banks’ balance sheets. Typically these deals did not actively source assets but were used to create room on bank balance sheets by selling existing assets, actually or synthetically, to shell companies, often to reduce banks’ regulatory capital adequacy requirement. Note that selling the loan to a rival bank, with the negative implications for future business for the banks stemming from an on-going relationship with the client, and selling the loan to a shell company over which the bank often retained some control are qualitatively different activities.

During the 1990s the first signs emerged of a change in the motivation behind banks’ credit market activity. Banks began actively sourcing assets to transform with derivatives before selling them on; perhaps the principle instrument at this time was the asset swap.[36] With this development the banks changed from simply sellers of credit risk to dealers buying and selling for a mark-up.

The third phase, from 1999 to 2003, saw credit derivatives enter a more mature phase. The dealer community evolved to intermediate credit risk, regulators issued guidance on CDS treatment, ISDA issued its first set of standard definitions and the credit default swap became a standard instrument and building block for structured desks (and the relative importance of TRS and asset swaps declined). (Mengle, 2007) In the previous phase transactions had been highly specific and the transacting counterparts would have been involved in considerable private negotiations to agree mutually-suitable terms. Now the market entered a phase in which turnover became faster. Faster deal times required institutional mechanisms to replace the trust which in the previous phase had been built in longer bilateral negotiations. Industry bodies such as ISDA

[35] A TRS is similar to a CFD on a security price together with a swap of the security’s coupon for LIBOR. An nth to default instrument provides protection on the first *n* defaults in a defined basket and is similar to the equity tranche on a CDO.

[36] In an asset swap, a bond and an interest rate swap are sold together to transform the bond’s fixed rate into a floating rate (or occasionally vice versa). An asset swap in effect ‘exchanges the [fixed] coupon on a bond for LIBOR plus a spread.’ (Hull, 2003: 700) This reduces the bond holders sensitivity to changes in LIBOR.

drew together market participants to define standard contracts that were mutually acceptable to buyers and sellers. This process continued through several iterations of the standard CDS contract, including a revised set of definitions issued by ISDA in 2003.[37]

The revised definition of the standard CDS contract marked the beginning of the fourth phase, the contract was further standardised including standard coupon dates (Mengle, 2007). Trading of credit index default swaps, representing yet more standardisation, really took off in 2004 and has grown to be a major form of CDS trading.[38] This stage has also witnessed the large-scale entry of hedge funds into the CDS market.

It is possible to extend Mengle's analysis and add a fifth stage, starting in 2009, when ISDA overhauled the rules for CDS and introduced both net and cash settlements. CDS were originally physically-settled with a defined pool of bonds eligible for delivery in the case of a credit that were deliverable: meaning that if the bond issuer defaulted (a credit event in the reference credit) the bonds of the defaulted borrower would have to pass between CDS counterparts (physical settlement). They were also settled gross, meaning that for offsetting bought and sold credit protection via CDS contracts, bonds would have to be passed both back and forth, even if between the same counterparts and exactly offsetting. As volumes grew in CDS markets it became clear that gross physical settlement would not work in the case of a major reference credit. (Helwege et al., 2009) There were simply too many CDS contracts in relation to the available bonds to permit gross physical settlement to occur in a short time period. In particular any rush to buy defaulting or defaulted bonds for delivery into CDS contracts would push their price up and reduce the effectiveness of CDS to protect buyers of protection against default. New standard confirmations allow for net and cash

[37] These changes were made in the light of increasing volume together with specific aspects of the contract design which encountered operation difficulties. Mengle (2007) lists three changes: restructuring, corporate actions such as mergers and spin-offs and sovereign moratorium and repudiation.

[38] E.g. the Depository Trust & Clearing Company (DTCC) shows index CDS accounted for 32% vs. 58% in single name CDS notional outstanding for the week ending 2/12/2011. Although the DTCC does not hold details of all CDS traded it seems likely to be representative. DTCC total CDS notional outstanding of 27 trillion compares to a BIS total CDS outstanding at June 2011 of 44 trillion USD. (Deposit Trust and Clearing Corporation, 2011)

settlement in a process managed centrally by large dealers and investors. (ISDA, 2009b, 2009a)

With these developments CDS, and credit derivatives more generally, have become trading instruments for capturing movements in price.[39] If they are used as hedges in a portfolio it is as 'surrogate hedges' (Das, 2010); in other words not as insurance against a particular asset but to profit from related price moves by buying and selling to compensate for losses elsewhere. For example credit valuation adjustment (CVA) desks are responsible for hedging the counterparty credit risk in derivatives books, a tricky task not only because the exposure moves with moves in the replacement value of the derivative but also because there are few or no exact hedging instruments. Instead CVA desks hedge to a large degree with standard CDS, the most liquid credit instrument available. Considerable basis risk exists between the two instruments, not least because counterparty losses are not deliverable into CDS auctions. CVA desks hope that they will be able to make trading profits on the CDS to offset losses on counterparty exposures.[40] Similarly Sovereign CDS, prominent in the news during the Sovereign Debt phase of the financial crisis that began in 2007/8, have been criticised for not paying out as 'insurance' to compensate buyers of protection in the event of default. The CEO of ISDA's defence against these critics speaks volumes:

> Most importantly, the critics of the product have misunderstood the fundamental difference between CDS and insurance. While CDS is often referred to as insurance it is not. It is a traded financial product and thus participants can buy it and sell it any day regardless of whether a credit event is declared or not. Currently, even without a credit event in effect, an owner of protection can sell it and get paid about 61 percentage points of the notional upfront and 5 per cent of notional over the term of the

[39] CDS are very rarely traded by non-financial firms, posing a puzzle in mainstream accounts of derivatives leading to articles such as 'The promise of credit derivatives in nonfinancial corporations (and why its failed to materialise)' (Smithson and Mengle, 2006)

[40] As counterparty credit exposures are increasingly marked-to-market using CDS price, CDS can act as a better hedge against balance sheet volatility than it can against event of default by the derivative counterpart.

> contract, thereby monetising his gains and exiting his position. This price is consistent with the current Greek bond prices in the 30s as a percentage of par. Quite unlike insurance, CDS can pay on any given day by unwinding the position. A credit event simply forces payouts on the same day. (Voldstad, 2011)

The use of credit derivatives has not only grown rapidly but has also changed in character, growing from bespoke claims against a single counterpart to a trading instrument whose payout is thought to come from its sale in the market. This is a typical derivative story. It rest on the expansion of banks' activities to become derivatives dealers and the practices that they adopt to increase their profits through increased volume. I explain these processes in more detail in the next chapters.

1.5 **Conclusion**

Starting in the late 1980s, derivatives markets have grown dramatically. Examination of OTC markets shows that banks are at their centre, forming a counterpart to the overwhelming majority of OTC derivatives. OTC derivatives began as bespoke instruments; the second half of this thesis investigates the various ways in which they tend to become more standardised, as illustrated in this chapter, with the development of credit markets. Banks have had to manage their desire to increase the amount of derivatives they trade against the concurrent pressure of smaller margins, but overall the statistics reveal ever-increasing amounts of derivatives trading. A more qualitative examination of ETD reveals the nature of derivatives as trading instruments *par excellence*, that is as instruments designed to allow repeated buying and selling to capture price moves.[41] Trading a cash-settled derivative is a qualitatively different activity from exchanging an asset for money, and correspondingly the underlying that a derivative references is qualitatively different to a commodity.

[41] Chapters 6, 7, and 8 place banks' activities in OTC markets in the context of managing the growing scale of derivative trading. This is bound up with the forms of standardisation that occur. In many ways, as these chapters show, OTC derivatives increasingly resemble ETD. OTC might thought to be the naked or new-born form of the derivative that provides a starting point for analysis.

These are the stylised facts that a theory of derivatives must confront. To paraphrase Marx, the difficulty lies not in showing that derivatives are associated with banking, finance and trading but in discovering how, why, and by what means banks became associated with derivatives.[42] This thesis addresses the theory of how banks evolve and become derivatives dealers, and how their actions as derivatives dealers have given rise to today's derivatives. Explaining how banks become derivatives dealers is the key to understanding how derivatives markets have come to be as they are, and it is a question that is not addressed elsewhere.

Mainstream economics generally places derivatives in an Arrow Debreu framework of allocational efficiency and points to their role in completing markets (Ross, 1976). This allows policy prescriptions from such major international institutions as the International Monetary Fund (IMF) that claim derivatives the sharing of risks and the shifting of risks to those best able to bear them. (IMF, 2002) This is at odds with the character of derivatives, where exchange of the underlying is impossible and activity is based not around fixing prices but the opposite, acting on the movement of prices to make profits. Moreover such a theory contains no mention at all of why it is banks that make these markets.

Critical and heterodox approaches have fared better than mainstream economics. Economists and others have investigated the rise of derivatives in the context of more general developments in capitalism (e.g. LiPuma and Lee, 2005, Bryan and Rafferty, 2006, Wigan, 2008, 2009); while economic sociologists bring close study of the relations in these markets to the fore. Otherwise, Marxists have hardly theorised derivatives, and certainly not as a banking activity. Toporowski's (2000) work in the post-Keynsian and Kaleckian tradition rightly places the growth of derivatives within a process of financial inflation. These approaches, in particular those of economic sociologists, have a considerable advantage over the majority of economists in that the researchers have evidently visited trading floors (e.g. Beunza and Stark, 2004, Godechot, 2008), interviewed

[42] 'The difficulty lies, not in comprehending that money is a commodity, but in discovering how, why, and by what means a commodity becomes money.' (Marx, 1976: 186)

traders and bankers (MacKenzie and Millo, 2003) and base their findings on close study of the markets at work (e.g. Knorr-Cetina and Preda, 2005). However, although they bring considerably more insight into derivatives than mainstream theories, their approaches do not confront the character of derivatives markets and their growth as presented above. Above all they do not theorise derivatives as a banking activity.

Analysing theoretically how banks have evolved to become derivatives dealers and how the impact of their actions in this role has shaped derivatives markets is critical to understanding derivatives but it has not been addressed elsewhere. To address it requires a method suited to the task. Political economy, in particular Marxist political economy, can be used to develop logically, and from simple categories, a theory of banks that is capable of expanding to encompass new banking activities and of analysing and logically organising the historical development of different forms of banking to give an understanding which at once incorporates and penetrates these changing appearances to give deeper theoretical insight. More detailed insight into different forms and appearances of banks from other disciplines, particularly other schools of political economy and sociology, will help to develop more detailed understanding of the practices that develop within this theoretical framework and of the growth and changing character of derivatives markets.

In the first part of this thesis I discuss banks and their central role in derivatives markets. In Chapters 3, 4, and 5, covering first discounters and commercial banks then securities dealers and finally derivatives dealers, I develop a political economy theory of banks that theorises their expanding role to include them as derivatives dealers. The theory draws heavily on Marx and Hilferding but also examines a wide variety of banking literature. These chapters provide the core of the analysis.

In the second part of the thesis I apply close attention to the concrete practices of dealers in derivatives markets to show how practices undertaken to help expand trading volumes become established and not only spur the growth of these markets but change their character. The analysis becomes more concrete and draws in institutional and historical material on the development of derivatives

markets. Beginning with the regulation of banks and derivatives markets in Chapter 6, I introduce historical contingency to help to explain why the evolution of banks' role occurred particularly in the late 1980s. Chapter 7 investigates the roots and impact of developments in contracts and clearing activities on derivatives, and Chapter 8 turns to valuation models and risk management. The original contribution of the analysis, however, owes much to the methodology used, which I discuss in Chapter 2.

2 Methodology

2.1 Introduction to Methodology

This chapter outlines the method of analysis used in this thesis, and in doing so provides an overview of the analysis to follow. In particular it shows how the choice of method and the need to analyse derivatives as a banking activity are bound up together, and that the political economy approach chosen is particularly suited to explaining banks' evolution, both from the basic analytical categories of capitalism and from commercial banking, to incorporate market making in securities and derivatives. The method employed draws heavily on Marxism and historical materialism. Applying such an approach to derivatives markets is original in itself, but more importantly this viewpoint provides insights that are not found in other investigations of derivatives markets.

Perhaps the first thing to say about the methodology, and which is not explicitly explored further here, is that it assumes the existence of a reality which is the object of our study;[43] i.e. reality is not something subjective constructed only in our thoughts. The objective world is complex and concrete, and provides the researcher with observable data. It is the role of theory to replicate this reality in thought: in other words, to try to understand it (Marx, 1973: 101).[44] This is one way in which the approach can claim to be scientific: it builds a theory from observed data (Collins, 1982: 5).

In order to build a theory it is necessary to use abstraction. In fact if we are trying to form a theory of the complex and objective world that we observe, all theory is necessarily an abstraction; the absurd and impossible alternative would be to attempt to describe reality in all its complexity, the cartographic metaphor being a

[43] The first element of Lenin's Elements of Dialectics is: 'the objectivity of consideration (not examples, not divergencies, but the Thing-in-itself).' (Lenin, 1965)

[44] 'Marx claims his method starts from the 'real concrete' (the world as it presents itself to us) and proceeds through 'abstraction' (the intellectual activity of breaking this whole down into mental units with which we think about it) to the 'thought concrete' (the reconstituted and now understood whole present in the mind).' (Ollman, 2003: 60, quoting Marx, 1904: 293-4)

map on a scale of 1:1. Therefore the aim of this methodology section is to consider the way in which these abstractions are made.[45]

Abstractions can legitimately be made in various different ways that result in different insights into the real world that is being observed. First, the method here conceives of the world as being in perpetual motion.[46] This means that things should be conceived as moments in a process, with understanding where they spring from and where they are headed an integral part of understanding what they are now, making this methodology perfectly suited to explaining how banks came to be derivatives dealers.

Second, it views the world as relational. This means, first understanding categories in relation to other categories, as day is incomprehensible without night; second, it means viewing the world through social structures, as explored further below. More prosaically, and more relevant to derivatives, property is not a thing; it is a relationship, an agreement – and furthermore, if I own something such as a claim to the profit from a derivatives trade with a derivatives dealer, you do not own it. These characteristics are present but not always explicit in what follows.

Third, at the core of the analysis process, as discussed below, is an examination of parallels between categories that have been abstracted, probing both similarities and differences. Categories in this view are never simply the same or different, but thanks in part to a consideration of different possible abstractions, can be both the same and different at the same time.

[45] Marx and Marxists use the term abstraction in a number of ways to show how abstractions can be used in a variety of ways. It is used here in the most usual way stemming from the Latin 'to pull from', i.e. to pull out certain elements. Here it can be a noun and a verb and is a necessary part of any understanding (Ollman, 2003: Ch 5). However abstractions can be badly drawn and used for a variety of purposes. In the methodology section of the *Grundrisse*, Marx states: 'The population is an abstraction if I leave out, for example, the classes of which it is composed' (Marx, 1973: 100). Ollman describes this as 'ill-fitting mental constructs' (Ollman, 2003: 62); abstractions are inevitable but can be illogically made. Saad-Filho (2002: 8-15) distinguishes between 'mental generalisations' (i.e. 'ill-fitting mental constructions') and 'real abstractions'. Abstractions are inevitable but care must be taken over their drawing and use.

[46] It is key to this method to understand the world as in a constant process of change and reflecting that constant change in analysis. As Engels said 'motion is the mode of existence of matter' (Anti-Duhrung quoted in Waddington, 1974: 37). This contrasts with much mainstream economics which deals with equilibrium situations, which are necessarily static. Analysis which approaches derivatives as undergoing a process of change provides very different insights than can be obtained by conceiving of them as static, unchanging over time.

The rest of this chapter is organised as follows: section 2.2 explores how this method asks how things are made at various levels, from objects themselves to social structures and finally theory itself. Section 2.3 explores the system of logic employed in this thesis. This logic is shown to govern in turn the order in which the presentation of the analysis should proceed (section 2.4); the treatment of evidence and ideas (section 2.5); and the impetus for movement through the analysis, in particular here the evolution of banking (section 2.6). Section 2.7 briefly discusses the incorporation of other theory and ideas into the analysis, in particular the treatment of mainstream economic theories of derivatives. Section 2.8 concludes the chapter.

2.2 How are things made?

One characterisation of this approach is that it asks by what process things came to be made, a question of obvious pertinence when asking how derivatives markets came to be made by banks. This question can be posed at a number of levels. First, by asking about the things under consideration, e.g. derivatives instruments, as well as the social structures within which they are made, e.g. derivatives markets with banks acting as dealers; and second, by asking how abstract objects can be made in thought. This is the main subject of this chapter on the methodology used in the thesis.

In advanced capitalist economies, where derivatives are principally traded, the social relations that organise society are based on the exchange of products in the market. However, the products traded in the market do not come ready-made. The analysis must investigate the way in which they are exchanged and also, crucially, the way in which they are produced (how they come to be in the market in the first place) and how production and exchange interact. More specifically in this thesis, to ask how derivatives markets came to be as they are it is necessary to examine more than simply the price and the manner in which derivatives transactions occur (which is what much derivative theory does); we must ask how and between whom derivatives are ‘made’.

An investigation of the development of banks and derivatives must also ask how the social structures in which these derivatives are made have come about: how

are derivatives markets made? Simply put, mankind has certain basic needs and for millennia has acted socially in order to meet them, and in doing so mankind has come to reproduce itself. The social structures established in the process have influenced how society develops, in terms of both defining and meeting needs.[47] This approach examines these social relations, but also looks through them to see how they relate to and spring from the reproduction of mankind. There are two implications to this: first, in addition to asking how the things being exchanged are made it is necessary to ask how the market itself is made. In general, how did it come about, how did society come to arrange itself such that it organises its work and its output via market exchange? (Saad-Filho, 2003). And more particularly here, how did derivatives markets come about? Derivatives are not made as tables and chairs are, but nevertheless they become property and are exchangeable in the market, and part of the role of this thesis is to explain how this comes to be. Second, the analysis must be at least cognisant of the way in which derivatives fit into a social structure which must, at base, meet mankind's continuing and immediate needs; e.g. the production of food, clothes and housing. In short it must relate derivatives to production.

Paralleling the questions above, the methodology must also consider how the abstract category of derivatives is created in thought. First, the previous paragraph talked about mankind and its reproduction; these are abstract categories which exist only in theory. In reality there are only individuals acting in the circumstances in which they find themselves, but in order for us to understand the mass of individuals it is necessary to create abstract categories in thought.[48] Second, it is worth saying of these abstract categories that the category 'reproduction of mankind' does not exist separately from social relations; rather reproduction occurs through social relations, which as a result are as important to the analysis as the reproduction that they achieve. In other words, the highly abstract concept of the reproduction of mankind is not somehow more important

[47] 'The basic laws of motion of history are those of real men, themselves producing their own material existence in a given social framework' (Mandel, 1976: 18).

[48] Attempts to build theory by aggregating the actions of individuals must, unavoidably, make structural assumptions to avoid the impossibility of directly replicating the complexity of observable reality (Fine, 1980: 10-11). Too often these critical abstractions remain unconsidered within such theory. Moreover such analysis also tends to imply individuals' needs and responses are transhistorical. Historical materialism argues that actual individuals' needs and responses to them stem from the conditions in which they find themselves and thererfore, amongst other things, vary over time.

to the analysis than the more observable social relations through which it is achieved and manifests. Social relations (i.e. the way in which society organises itself to meet its needs) are central to the approach taken in this thesis, which therefore draws on a mixture of economics and sociology, where sociology is more concerned with the detailed examination of these relations. The rest of this chapter discusses the construction, in thought, of derivatives.

2.3 The overall logic of theory construction

Abstraction is the creation of categories in thought to allow an understanding of a mass of observations (to, necessarily, avoid the chaos of a 1:1 map). As is explored below, analysis interrogates these categories, comparing and contrasting them with each other across different levels of abstraction and with the appearance of the real world. Yet these categories must be constructed in a scientific and logical way. Perhaps the dominant logic that must be applied is that elements of theory cannot be dropped into the analysis without explanation; they must be contained within and develop out of the analysis itself.

This theme reasserts itself throughout the rest of this methodology section in the following ways. First, the analysis cannot start with complex categories. This is clearest when considering the category which is itself the object of investigation; hence an investigation of derivatives cannot be organised in such a way that it begins with a fully-developed category of derivatives. The analysis must move and expand from simpler to more complex categories which come to mirror the complex reality under observation more closely, and in so doing, showing how complex categories such as ‘derivatives’ come to be constructed in thought. The next subsection, on building from simple to complex categories, discusses this in more detail.

Second, as the discussion here is about the attempted replication of reality in thought, the endogeneity of ideas themselves is also vital: ideas, as any other element of theory, cannot be included without explaining how they arose. This has two implications: first, the analysis cannot be ideal but should be materialist. This means that the theory should be based upon analysis of the facts as observed, and on the entirety of the facts as they are experienced both today and

historically. Crucially, any pre-selection of facts implies some preconceived ideas about what is and is not important; i.e. an unspecified / undeveloped theory has been used to select the facts.[49] This is discussed in the section headed 'A materialist approach'. Among other things, this means beginning the process of investigation with derivatives markets today (albeit including their history), which are dominated by financial derivatives and banks and not, for example, by ancient practices or agricultural derivative markets. Second, with regard to the endogeneity of ideas, and as explored at the end of this methodology section under the heading 'Incorporating theory into theory', assessment of the various existing theories of banks and derivatives should be located, as far as possible and practical, within the theory itself.[50] 'Everything that happens in the material world is to be explained from the material world itself' (Waddington, 1974: 23), and this includes the generation of ideas, which must be located in careful observation and analysis of the material world. In particular, the theory developed must include not only the evolution of the role of banks but must also explain (other) derivative theory.

The third application of the overall logic is that the impetus for movement from simple to more complex ideas must also be contained within the analysis and again, cannot be added without explanation.[51] The social structures we observe appear to be in constant motion as new developments emerge in reaction to old situations, and theory too must reflect this movement. History has a role to play here, but must also be approached with abstraction and logic. I deal with this in more detail in the sub-section below headed 'Impetus'.

The rest of this chapter details these aspects of the methodology, always with this particular logic in mind – that as we build the model it is not possible to drop new categories in without explanation.

[49] According to the logic of the methodology, these ideas would have their origin in the material world but their deployment here would not accord with the logical construction of the analysis and they would to be out of sequence.

[50] This includes other, existing theory as well as this theory iteslf.

[51] The third element of Lenin's *Elements of Dialiectics* is: 'the development of this thing, (phenomenon, respectively), its own movement, its own life' (Lenin, 1965)

2.4 Building from simple to complex categories

Given the complexity of the social structure under investigation, this analysis follows a logical expansion rather than a simple chain of causation. The social structure through which the development of society is mediated is complex, and for this reason simple monolinear unidirectional causality is rarely useful, as causality flows between different categories and can also flow in both directions between two categories. I trace the development of banking from discounting bills of exchange, the issuance of banknotes and the collection of deposits in Chapter 3 to the trading of securities in Chapter 4 and the trading of derivatives in Chapter 5 (the choice of categories and the starting point are investigated further below). It cannot be said that each of these caused the next, nor can the embryo of each be found in the previous one, although both may be partly true. Nevertheless it is possible to trace a logical process of development through these forms of banking if the analysis expands from the simple categories of exchange and trade credit between capitalists to incorporate the increasing complexities of commercial banking before also taking in investment banking, and particularly derivatives trading. Banking in this analysis incorporates ever more activities without dropping its old ones, while the analysis itself progresses to concentrate on the new activity. In tracing the development of banking in this way the analysis becomes more complex and concrete.

At the same time the process, as analysed, must be historically consistent – there is no escaping the fact that things developed in certain ways over time, and the analysis must be consistent with this. Accounting for this has two aspects: first a linear chronological history of the development of derivatives is subject to the problems described above, i.e. abstractions must be made in order not to attempt an impossible recounting of the concrete world in all its complexity (the 1:1 map), and these abstractions must be carefully considered. In other words, in order to organise historical facts into a coherent analysis a logic must be applied, and in order to build a logic, historical facts must be used.

Second, ‘investigation proceeds from what history shows to be the case to the conditions that must prevail if experience of that kind is to be possible’ (Sayer, 1983: 109). This analysis does not aim to prove that things happened – they can

be seen to have happened - what matters is showing how they came to be, so history matters here because it tells us how things happened over time. The analysis must provide the conditions that can explain how those things came to be. Put another way, the facts must be organised in such a way as to build, in thought, a logical and historical case for how things came to be as they now are.[52] The question that Sayer's quote above and this point pose is which facts must be so organised. and I discuss this in the next section.

2.5 A Materialist Approach

The abstractions we make, and their organisation according to the logic outlined above, must be informed by examination and knowledge of the objective reality: in this case, of derivatives markets. As stated briefly above, this necessarily means examining the whole and not just part of the thing under investigation, for selecting a part to study implies that a choice of abstraction has already been made and that we are starting the analysis with preconceived ideas and applying theory without explanation.

To render this process practical, the research process will naturally be subject to iterations, false turnings and the revisiting of previously-established categories and ideas. Within these iterations there appears to be contradictory movement from complex, concrete reality to simple abstract concepts and from simple to complex concepts. There is no contradiction, however: the latter is the construction in thought or in analysis; the former is the extraction of facts to be marshalled (Marx, 1976: 102). Building the analysis in thought from concrete facts is inevitably an iterative and painstaking process.[53]

The process necessarily begins with the drawing up of categories from the appearance of things – metaphorically we might think of moving to the discrete from the continuous. A key tool will be drawing parallels between categories, finding both commonalities and differences.[54] Armed with these commonalities

[52] Sayer, after Hanson, identifies this fitting of plausible conditions as 'abduction or retroduction' (Sayer, 1983: 115).

[53] This description and analysis of methodology is itself an abstraction, hence while the iterations are described in a neat process of several steps the messy reality is a more continuous and complex process.

[54] Marx points out how this approach differs from much mainstream economics: 'It is characteristic of the entire crudeness of 'common sense' … that where it succeeds in seeing a distinction it fails to see a unity, and where it sees a unity it fails to see a distinction. If 'common sense' establishes distinctive

and differences between categories it becomes possible to draw and examine subcategories, and in this light to redraw and examine the initial categories, and so on. In this section we see how a category of 'derivatives', divided into historical but also logical subcategories, is drawn, and how this leads to a re-abstraction and re-drawing of categories to approach derivatives via the analysis of banks. In the next section, 'The impetus for movement' the category 'banks' and the subcategories thereof are re-examined to provide more substance to the analysis than if it remained at the level of examining appearances only.

The first step, then, is to identify a category of things that we can call derivatives rather than something else. This requires examination of the entire object of analysis, in order not to make illogical use of theory to preselect some aspects before the theory has been developed, and must be applied through time as well as through other dimensions. As mentioned above, however, abstraction must be applied to history as well in order not to be faced with a chaotic cacophony of historical facts. An examination of history leads to the identification of exchanges stretching back through time that share a common nature, such that we can call them derivatives.

A second step allows us to draw subcategories and to identify at least four different eras between which differences in the nature of derivatives can be observed: derivatives stretching back into ancient history, and in particular to feudal and slave-based societies;[55] those in capitalism used for the exchange of commodities, most typically agricultural commodities; those used in capitalism for financial claims prior to the 1980s and based primarily on so-called physical delivery (Chancellor, 1999, Mixon, 2009); and finally those financial derivatives since the 1980s that are increasingly based on cash settlement and whose volume has grown at such an astonishing rate. In this way the breaking down of the complexity of the history of the category 'derivatives' can be approached in

determinations, they immediately petrify surreptitiously and it is considered the most reprehensible sophistry to rub together these conceptual blocks in such a way that they catch fire.' (Marx and Engels, 1961: 339, quoted in Ollman, 2003: 77)

[55] Marx, and historical materialism more generally, identify historical eras leading up to and including capitalism using a similar technique – in common are the means by which man acts socially to secure the reproduction of society, but differences occur in the relations of production contained therein, particularly with regard to the ownership of the means and objects of production. (e.g. Blackledge, 2006: Ch.4) These more abstract categories regarding the organisation of society, e.g. capitalism, slavery, feudalism etc, are not taken up in this thesis and the analysis proceeds with the basic categories and framework of analysis established for the capitalist mode of production.

thought starting with simple (sub)categories such as those identified in this example.

A closer examination of these initial subcategories, however, led in the case of this thesis to a redrawing of the initial categorisation. The latest period of derivatives activity in this approach becomes 'first amongst equals', for a number of reasons. First, and most simply, it is the era to which the research question refers: an investigation of the social context of derivatives in light of the enormous surge in activity in and profits from primarily financial derivatives since the 1980s. Second, examination of the current most-developed form can give clues about more simple forms, while the converse is not true. For example it is not possible to extrapolate from bank deposits in the 19th century to the international banks of today. With full knowledge of the banks of today, however, we can trace a historical and logical path of development from the 19th century to today. Moreover, third, by necessarily including the derivatives of today in examination of the facts (to have excluded them would have been to include theory before examining the facts) we colour our view of preceding forms.

It should be noted here – and I explore this further in the next section – that this implies that the results of the analysis are not fixed; as new realities come into existence, previous analysis need revisiting in light of new developments and existing logical structures require re-examination (Saad-Filho, 2002: 14-15, Marx, 1976: 101). What the various forms have in common as an abstract category, e.g. as 'derivatives', or what might be called their essence, alters with each new form included in the category. Thus as, say, cash-settled derivatives traded by banks on a massive sale become incorporated in our category of 'derivatives', our idea and understanding of 'derivatives' is altered. This updated understanding of derivatives must then be used very carefully. In particular the categories that we use to for analysis today must be formed from observation of the material world today and cannot simply be applied to past instances.[56]

[56] This is often illustrated using the Marxist category of 'abstract labour'. First, 'abstract labour' is not a directly observable thing; it is an abstract category in thought. Second, however, it is not a category that would be applicable to a society that did not include generalised wage labour, where workers can generally move between jobs. In such a society a person would be tied to a certain activity, labour in this case is specific and the concept of abstract labour would not be appropriate. (Marx, 1973: 100-109)

Given that the derivatives of today (the last of the initial categories of derivatives above) are first amongst equals, it is possible to draw on some of the empirical realities of derivatives trading in the 21st century as established in the previous chapter, where the key findings were first, that derivatives markets are dominated by banks, specifically large universal banks that dominate the world of derivatives dealers, who form half of every OTC derivative deal registered by the BIS; and second, that the largest group of counterparts to derivatives dealers are non-bank financial firms trading financial derivatives.

This examination therefore leads to a redrawing of the initial categories of abstraction. Derivatives in this thesis are, as a result, approached as a banking activity, and therefore an understanding of banking becomes central to the analysis of derivatives. The process of building and interrogating categories is applied to banking and builds from a simple to a more complex understanding of universal banks culminating in derivatives dealing. This approach to derivatives via banking might be considered somewhat surprising: as established above, the appearance of derivatives through history might be thought to offer a more obvious route for analysis. Yet posing the problem in this way would still require an explanation of the breaks or boundaries between the various eras of derivatives. In fact the specificities of the current era, which for now might be labelled 'financialisation' without delving any further, makes it the most developed form available for study and should be the starting point for the investigation.[57]

The emergence of this form of banking in this analysis is the 'general illumination which bathes all other colours and modifies their particularity' in two ways (Marx, 1973: 107). First, to understand the current era of derivatives it is necessary to understand them as a banking activity. Second, there are aspects of derivatives that are revealed by analysing them in this most-developed form, which, used carefully, will help to illuminate prior forms. Thus, drawing heavily on Marx (1976, 1981) and Hilferding (1910), I interpret the theories of commercial banks and of banks as securities dealers, as outlined in Chapters 3

[57] Analysis of financialisation continues to grow, one of the most commonly cited definitions takes financialisation as: 'the increasing role of financial motives, financial markets, financial actors, and financial institutions in the operation of the domestic and international economies.' (Epstein, 2005: 3)

and 4 respectively, in such a way as to accommodate banks as derivatives markets. This requires adaptations to previous theory to incorporate the changing concrete reality that is observed.

Where should this analysis start? Identifying all banking would also take us back to pre-capitalist times, so a starting point for analysis must be chosen in which the logical and historical seeds of the current derivatives markets can be found and yet which provides simpler (but still historically and empirically valid) categories from which the analysis can proceed. This analysis of banking begins when a specialist in money matters starts to emerge from amongst capitalists engaged in commodity exchange, e.g. when a specialist discounter emerges and becomes involved in the extension of trade credit. This specialist becomes a bank. First, this starting point allows the analysis to begin with the established simple categories of Marx's circuit of capital; second, the emergence of the bank as a specialist and the nature of its specialisation are critical to understanding the banks' emergence from the workings of the capitalist system, leading to the development of commercial banks and the inclusion of market making in securities and derivatives. This starting point then is a subcategory of banking, and the drawing of these subcategories and their re-examination is further explored in the next section.

2.6 The impetus for movement

Having established a start and an end point for the analysis, the question of impetus arises; what causes the shift within the analysis from the start point to the end point? As established above, the analysis proceeds by abstracting categories. The process of moving through the analysis itself, from simple to complex and concrete, becomes a question of how the analysis makes the step from one category to the next. Consistent with the logic outlined above, i.e. with the idea that external or ideal categories cannot be simply dropped into the analysis, the impetus for movement must be located within the categories developed in the analysis.

This impetus can be located within the analysis via an iterative process examining the commonalities and differences between categories. For example, when

building an analysis of banking activity, first all the things that appear to be done by banks can be identified as banking. Second, we can attempt some general grouping of these activities into categories of a limited and manageable number of different bank activities e.g. deposit taking and commercial lending, securities dealing, derivatives dealing and so on. Third, we can once again ask what these apparently disparate activities share, in which analysis searches for a commonality which provides more insight than simply saying that they are all activities performed by banks, e.g. we can ask why have banks and not someone else performed these tasks. This more analytical commonality could be called the 'essence' of banking. Fourth, having identified the analytical commonality we can return to the different forms through which this is expressed and compare the categories both to themselves and to the common essence.

In passing through these iterations, a historical and logical order to the analysis develops, and in undertaking the later rounds of the iteration a more meaningful content than 'banking is what banks do' emerges along with the causes of the movement between categories. The commonality or essence of bank activity cannot be separated from the forms that banking activity takes – as mentioned above, the reproduction of mankind cannot be separated from the social structure through which it takes place. The forms are the way in which the essence manifests itself or is expressed. Investigation of how the essence and the forms of activities interact provides more substantial meaning than simply studying appearances and, as I show below, the impetus for movement throughout the analysis. I have already explained above how the essence itself is transformed over time by emergent new forms.

The commonality that emerges connecting various banking activities (forms) is that banks deal in claims to monetary value, buying and selling, swapping and transforming them. By issuing and sustaining claims to monetary value they allow activities that would not otherwise be possible, and they take a share of profits generated from these activities. These claims to value are apparent in different forms of banking, whether discounted bills of exchange, claims to deposited money, claims to coupons from borrowers, as in securities, or claims that are contingent upon underlying reference assets, as in derivatives. The

various forms of claim that banks issue come to act as property, yet this cannot occur simply because banks wish it to be so, nor are the claims that emerge independent of the way in which society more generally develops. Property in general is a social relation, an agreement among members of a community regarding who is entitled to use what (and who is not). This can sometimes be difficult to discern in the case of material goods, where things tend to appear as a relation between objects and people (this is my table, your cup, etc). Financial property, on the other hand, is perhaps more clearly a relation – it constitutes a claim, usually for money, by another person. However, for this claim to become property it must become socially established as such, legal recognition being only part of this process.

Private banknotes, for example, are the most apparent claim on the bank that takes on an objectivity to become property and money. Banks start issuing their own private banknotes because it is more efficient for capital as a whole than using the notes (debts) of a variety of capitalists; however banks must take on certain qualities and activities in order for their notes to be generally accepted and therefore useful as money. Once banks have managed to take on these qualities and claims against banks (e.g. banknotes) are used by capitalists generally as money, the activities of capitalists are in turn transformed. In short, banks act in reaction to developments in production, and in doing so both banks and society more generally are transformed. Claims do not easily become property either in practice or in theory; rather it is in the detailed process of giving content to claims that they can come to act as property and are shown to act as property in theory. This content is not simply economic; it is also necessarily social (potentially including legal, political and ideological elements).

The source of the movement between categories, as the analysis expands to take in new banking activities, is located in inconsistencies or tensions building up in the forms of banking (or between the form and the essence of banking) and/or between forms of banking and changes in society more generally.[58] In the

[58] Lenin's Elements of Dialectics no. 16: 'the transition of quantity into quality and *vice versa'* . No. 4: 'the internally contradictory tendencies (and sides) in this thing'. No. 5: 'the thing (phenomenon, etc.) as the sum and unity of opposites'. No. 6: 'the struggle, respectively unfolding, of these opposites, contradictory strivings, etc'. No. 15: 'the struggle of content with form and conversely, the throwing off of the form, the transformation of the content' (Lenin, 1965).

example of banknotes explained above, changes in the economy can stem from and result in growth in trade credit, which in time becomes inadequate or unsuited to the credit needs of the economy; the tension inherent in this provokes a change in activity from the banks – the emergence of banknotes – which in turn reflects back on wider society and provokes changes in activity there, and so on. Once again, by working closely with the forms of the categories, and with the essence or commonalities of these forms, it is possible to locate tensions and inconsistencies that provoke change.

In the case of securities, these tensions came in part from changes in the form in which property was held, which stemmed more from the wider economy than from within banking itself. As a result, banking took on a new activity, namely securities dealing, and in turn the growth of securities markets affected the behaviour of corporations. In the case of derivatives, a tension can be observed in securities dealing itself between the part of securities dealing related to trading for short-term profit in financial markets and the part that relates to lending to companies. Eventually this tension leads to a new form of trading securities that surmounts the tension by discarding that part related to providing finance; i.e. the emergence of derivatives trading. However as I discuss in Chapter 5, derivatives trading itself contains tension between the desire to be a trading instrument and the very nature of the derivative as a bilateral contract between two parties.

The contradiction of derivatives as untradeable claims to facilitate trading lies behind many of the practices that banks take up as derivatives dealers building the infrastructure of the market, as examined in Chapters 6, 7 and 8. For example, the increasing move to exchanges and central clearing in response to the current financial crisis can be seen as a response to the contradictory nature of the contract as an untraded, bilateral contract intended to facilitate trading. This contradiction is also important in the organisation of the derivatives markets in which banks are central, from the legal documentation to the regulatory environment and the emergence of valuation models and risk management.

2.7 Incorporating theory into theory

The paragraphs above have stressed how elements cannot be dropped into the analysis without an explanation of their origins, and the same is true of theory itself, which must be located historically within the social structures that have developed to meet society's needs. Chapter 8 does this explicitly by examining the use of derivative valuation theory and the risk management practices that have arisen in the last 30 years in the context of banks' derivative-dealing activities. Throughout the thesis, however, it is also necessary to locate derivatives theory more generally within the analysis, and this should in the end include this theory and the methodology themselves.

To some extent the location of other economic theory in analysis can be achieved with a comparison of this theory and that of mainstream economic analysis of derivatives. Perhaps the key difference between mainstream theories of derivatives and this analysis is that here derivatives and derivatives markets are approached as being made by banks. Asking how things come to be made must view the world as an unfolding process; what must be understood is how they came into being, and that must necessarily be within a social structure that is changing over time. This stands in direct contrast to mainstream economics with its focus on equilibrium, which approaches the derivative as an existing (and eternal) object. Little or no attention is given to its emergence; it must simply fill a space in and according to a mathematical model of distributive efficiency descended from Arrow-Debreu (1954).

A further implication of asking how things are made is that political economy looks beyond appearances. Mainstream economics, on the other hand, can be characterised as capturing and studying appearances only, failing to penetrate them for a fuller understanding. This again is related to a static view of the world. This study of single aspects of the (unchanging) appearance of derivatives markets and banking does, however, facilitate the incorporation of other theory into a political economy analysis. As new and changing forms are analysed according to the logical expansion outlined above, they can be contrasted with single and isolated orthodox accounts of the same appearances. The analysis that follows develops a single theory detailing the logical development and evolution

of banking, capturing and incorporating its changing appearance; e.g. it explains banks as deposit-taking *and* as securities dealers. Along the way a wide range of orthodox accounts of various aspects of banking are cited such as deposit-taking *or* securities dealers, each describing a small part of the whole,. These accounts, if not always contradictory, are at best independent from each other except for a common reference point: a hypothetical mathematical model of complete markets

Chapter 8 examines the uses of valuation theory and the risk management practices that stem from it. While these mathematical models do not look past the dynamics of exchange and price, they nevertheless provide a very useful tool for banks when trading derivatives. However these are not the uses that theorists usually imagine for their models, which turn out to be more useful for managing scale than for predicting prices or preventing losses from large price moves. To understand the practices and motivations of derivatives dealers using and developing these models, theory must first have developed from simpler to more complex categories, covering the expansion of banking activities to include derivatives dealers. In this way dealers' motivation, above all their profit motives, can be seen to inform their practices. As use of the models allows growth in the markets their use becomes entrenched because large-scale trading would be impossible without them, and the models take on objectivity. The models then in turn affect future practice in derivatives markets, influencing both their further expansion and their growth. In more philosophical terms:

> The *material* life-activity of social man begins to produce not only a material but also an *ideal* product, begins to produce the act of *idealisation* of reality (the process of transforming the 'material' into the 'ideal'), and then, having arisen, the 'ideal' becomes a critical component of the material life-activity of social man, and then begins the opposite process – the process of the materialisation (objectification, reification, 'incarnation') of the ideal. (Ilyenkov, 2012: 158)

Chapter 8 makes use of the studies of economic sociologists in this area, in particular the work of Donald MacKenzie. MacKenzie (XXXX) uses performativity, the idea that the economy is performing economics, to explore

how valuation models and risk management have impacted on derivative markets. In particular he explores how derivatives markets can become both more like theory (performativity) and less like it (counter-performativity) through the uses of the models by practitioners. The performativity approach challenges the idea that valuation theory is an objective and neutral observer of derivatives markets and that it does not or cannot influence them.

Performativity provides important insights into the use of derivative valuation theories but it is not consistent with the approach being outlined here. Performativity analysis starts with derivative valuation theories, without attempting explicitly to explain how these theories were made. In the approach being used in this thesis however elements of analysis cannot be *dropped in* this way but rather must develop out of the analysis itself. In this light performativity provides only a part of the required analysis. Observing the form and uses of derivative valuation theories Chapter 8 builds on the preceding analysis of banks as derivatives market makers to theorise the emergence of derivative valuation theory and risk management. Only having understood how they emerge can the analysis go on to investigate they come to influence further practices. Chapter 8 shows how the profit seeking of derivatives market makers provides them the incentive to increase the amount of derivatives they trade. The use of valuation theory and the practise of risk management are ways in which market makers can manage these growing quantities of derivatives. Once established these practices become a critical component of derivative market making, and they therefore come to impact its further development. Understanding these impacts is considerably enriched by theorising the emergence of derivative valuation and risk management theories and locating them in a broader theory of derivatives market makers and of banks.

Although dealing less strictly with theory, Chapters 6 on regulation and Chapter 7 on clearing and contracts are also informed by this approach. Namely using the theory of banks developed in the early chapters to inform analysis of banks' practices, the way that these practices become established and then essential to continued operation of the markets and finally the way in which they shape further the development of new practices. The effects of this process can be seen

in the resulting changes in appearance of these markets, not only in their growth but also in their character. Chapter 6 necessarily introduces some historical contingency into the analysis, which must remain historical as well as logical and should not consist only of (pre-ordained) unfolding from the commodity form. The key section, dealing with the rise of the Basle Accords (BIS, 1988, 1996, 2006, 2010) as a system of bank regulation, sees banks' adoption of a capital adequacy requirement as facilitating new activities (increased financial market activity) which, once established, give the new capital requirements a certain objectivity that influences future behaviour. Again the impetus for movement in the analysis stems from the interaction of banks and the broader economy and how each changes the other in the process. Similarly Chapter 7 locates the practices of dealers in the development of legal contracts and clearing processes in the theory of dealers that proceeds it, and shows how this has resulted in common practices that have taken on a certain objectivity and shaped the development of derivatives markets further.

2.8 Conclusion. How political economy method is useful for explaining derivatives

The logical next step when locating theory with theory would be to turn from other theories and attempt to locate the political economy theory developed here within itself. This would clearly be highly complicated and is beyond the remit of this thesis. It can be argued that historical materialism is objectively better science, and is science from the perspective of the majority of people, or of the exploited classes or some combination of these.

However, here it is enough to say that the task of this thesis is to explain how derivatives markets have come to be and, as Chapter 1 has shown, this means explaining logically how banks have developed over time to become derivatives dealers. The key points of the method outlined in this chapter are aimed at performing exactly this task: to study derivatives markets and banks as a process of development, building logically and historically from simple to more complex banking activities; to view this as a continual social process of 'men, themselves producing their own material existence in a given social framework' (Mandel, 1976: 18) and in doing so altering that social framework for those that follow;

and to penetrate the current appearance of derivatives markets to ask how they have been made. In doing so, derivatives dealing is illuminated and explained as it cannot be – and has not previously been – illuminated and explained using other methods.

3 Discounters and commercial banks

3.1 Introduction

Banks collect money from around the economy that would otherwise lie idle and lend it to capitalists that can put it to use. The most important banks of the 21st century do much more than this, however, and in particular they are derivatives dealers (Duffie, 2010). In light of their new and current activities a re-examination of how commercial banks emerge, function and take on new activities is required. The analysis presented here begins by explaining the emergence of the banker as a simple lender, corresponding broadly with the historical development of banking, in particular in England in the 19th century. In doing so, this chapter outlines the logic of banking and credit money, laying the groundwork for the explanation of more complex banks that are also securities and derivatives dealers in later chapters.

As capitalism develops from the simple circulation of money and commodities, credit takes on an increased role and finance specialists emerge. The analysis of lenders is presented in two phases. In the first phase some merchants become specialised lenders via the mechanism of discounting, lending their own capital to earn interest and developing specialist skills in the process that serve them as commercial and investment bankers. In the second phase, building on the first, commercial banks emerge and with them, credit money. Banks profit from their intermediary function via credit money and deposits, rather from the simpler lending of their own capital to earn interest.

Banks are not simple lenders: they increase the amount of money acting as capital by creating loanable money capital. In order to do so, bank liabilities serve as money, in other words a claim to money comes to act as money. To understand how they manage to do this requires a theory of money. Credit and money can both be theorised as emerging from simple commodity exchange. Taken together, they form the foundations for a theory of bank credit money.

In a logical expansion from simple exchange, a theory of banking develops that incorporates the emergence of both credit money and commercial banking. By

contrast, many other theoretical approaches to banking introduce credit money exogenously, and many theories of credit money do not include a theory of banking. The approach to banking in this thesis provides a theory of the bank as a particular capital, profiting from the development of specialisations vis-à-vis the rest of the economy.

The essence of the bank, as developed in these chapters, is an entity creating and sustaining claims to monetary value that enable activities otherwise not possible and from which banks earn a profit. For commercial banks, these claims are claims to money that act as money and allow additional economic activity in a number of ways.[59]

The chapter has three sections. Section 3.2 starts with the first seeds of specialisation; banks as discounters of trade credit. Section 3.3 examines the emergence of the commercial bank from these specialising merchants. Section 3.4 explores the nature of money and bank credit money.

3.2 **From Trade credit to discounters**

The theoretical analysis of the banks of the early 21st century begins with discounters. The motivation for starting with discounters is both logical – these institutions separate themselves from other merchants by specialising as financial specialists – and historical, discounting being an early banking activity (Kindleberger, 1984: 1114). The analysis of discounters here makes use of commodity money, which allows isolated analysis of the development of their core specialist attributes as lenders and the payment of interest on debt that is bought and sold. In the next section the specialist that emerges is the more complex commercial banker, complete with bank credit money.[60]

[59] For banks as securities and derivatives dealers this essence of banks manifests differently, as will be seen in later chapters.

[60] This order of analysis in some ways parallels that of Volume 3 of *Capital*. Marx first identifies the money-dealing capitalist as a specialist (Ch. 19), then examines the lending of money to production in isolation (Ch. 21) and finally expands the analysis to take in the role of banks collecting money from across the economy and transforming it to loanable money capital by lending it to earn interest (Chs 30-32) (Marx, 1981). However, in Volume 3 there appears to be a more qualitative separation between money-dealing capital and interest-bearing and loanable money capital.

Banking credit emerges from, but is of a qualitatively different nature to, trade credit[61] (Lapavitsas, 2003: 77, Marx, 1981: Ch. 30). Trade credit is extended between capitalists already linked by exchange; their preoccupation is still with the exchange of commodities and not the advance of money *per se.*[62] A decisive moment in the development of capitalist activities comes when credit is instead provided by those lying outside the chain of production, e.g. discounters and banks. A fundamental change has occurred; now the lender's aim is to make money from lending money and not from the exchange of commodities. This qualitative difference sets in motion processes of specialisation that underpin how banks develop and profit.

3.2.1 The circuit of capital and trade credit

Analysis of the emergence of the specialist begins with the established and most basic categories of analysis of the capitalist economy, captured in Marx's circuits of production and circulation. In circulation, equivalent exchange values are exchanged, money for commodity, commonly denoted as:

C-M (sale) or M-C (purchase) where C represents commodity and M, money.

In production, surplus labour is extracted from labour power (a commodity), commonly denoted as:

C – P – C' where P represents production and C', commodity pregnant with surplus value

Only in the coming together of production and circulation can the surplus value be realised. Capital is the whole, the coming together of the two, and is characterised by advance and repayment at a later time plus an increment. This is the circuit of capital as a whole, which can be represented linearly as:

M – C – P – C' – M'

[61] Trade credit is 'the credit extended by business firms to other business firms' (Bannock et al., 1998: 412), typically those connected by exchange.
[62] In trade credit '…it is the metamorphosis of the commodity that is mediated here by way of credit; not only C-M, but also M-C and the actual production process' (Marx, 1981: 613).

…or circularly, to better capture its ongoing continuous nature, as shown in Figure 3.1 below.

Figure 3.1: The Circuit of Capital

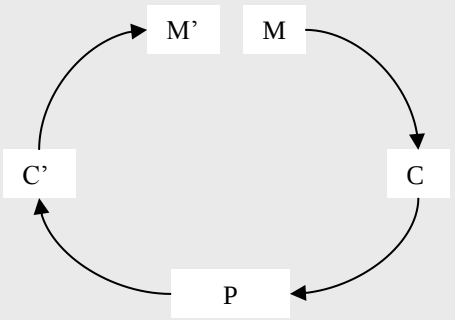
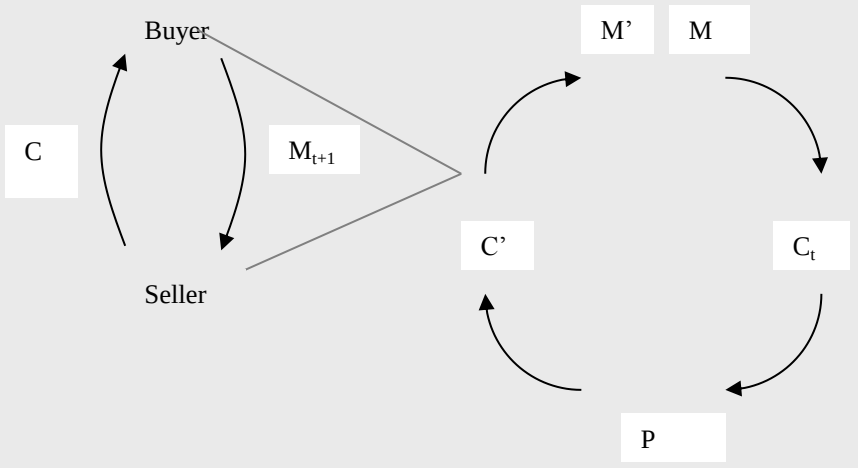


Figure 3-1 depicts the circuit of capital, where C is commodity, P production, C' commodities containing surplus value, M money and M' the original stock of money plus surplus value. Money is exchanged for commodities, including labour power, which enter the production process, producing commodities pregnant with surplus labour which can then be exchanged for a greater sum of money than was originally set in motion.

In Figure 3.2, below, the circuit of capital is recreated but now attention is directed to the emergence of trade credit. Where previously the completed commodity C' was exchanged for money, now it is exchanged for a promise to pay later.[63] On the left-hand side of the figure the C'-M (or M-C' to the buyer) relation is expanded to show trade credit. Here commodities, C, are sold now, in time t, in exchange for a promise of money later, time t+1.

[63] Trade credit can result from an 'inelastic supply of coin' (Kindleberger, 2000: 56), in short the buyer does not have money to hand until she has in turn sold the commodity (or another). The spread of trade credit practices is also linked to competitive pressures amongst capitalists. (Lapavitsas, 2003: 73)

Figure 3.2: The circuit of capital with trade credit



Instead of commodities being changed for money now, as in the original circuit, with trade credit they are exchanged for a promise to pay later, at *t+1*. This gives the selling capitalist two major problems: no money to restart the production process and the threat of non-payment. Selling the debt to a discounter provides a solution to both these problems.

3.2.2 Marketability as a solution to lender problems

The temporal mismatch – commodities now for money later – that occurs for the provider of trade credit gives rise to two problems, both entailing the potential disruption of production. First, releasing commodities now in exchange for money later prevents money being available to the seller to begin a new production cycle. Second, it risks delayed or non-payment of the debt (Lapavitsas, 2003).[64] These general problems of liquidity and risk for the lender can be seen throughout the development of the credit system.

One way of solving these problems for lenders is by making the debt – the buyer's promise to pay later – marketable: the debt is sold to an outsider for money now. The outsider is the discounter.[65] A discounter buys the debt from the lender (in the example so far, this is the seller of commodities awaiting payment)

[64] If the seller has idle money that can be used in the meantime, they can of course restart the production cycle, but this merely displaces the problem elsewhere. Extension of trade credit also diminishes the availability of these hoards for future use.
[65] Making debt marketable is also encountered in securities markets, discussed in the next chapter.

and assumes the debt. The discounter buys the debt with money at a discount to its face value now and is paid by collecting the full face amount from the buyer of the commodities later.

The discounter of trade credit, for a payment via discounting, adds efficiency to the overall production of commodities by addressing the two problems that arise for lenders, as identified above. First he allows the seller of commodities to start a new production cycle before payment has arrived for the last, and second, he removes the risk of late or non-payment (Lapavitsas, 2003: 77).

To do this, the discounter converts the commodity buyer's particular and unexchangeable promise to pay into money, a more generally acceptable form of value. This exchange of money (the general) for the (particular) trade credit resolves both problems at once: money is the generally acceptable means of exchange and it is a store of value in general, not exposed to the relative price movements of particular commodities (Marx, 1976: 193). [66]

Figure 3.3, below, presents the transaction as a stylised illustration; it presents the initial and final balance sheets of the participants and, between the balance sheets, the exchanges that occur. The selling capitalist, S, and a discounter each start with an initial endowment of 10 which they hold as commodities for sale and money respectively. The buyer has no initial endowment. In stage 1, the seller, S, sells commodities to the buyer, B, and accepts a promise of payment later (at t+1) in return; i.e. accepts a bill now, as shown on the left under the title 'Stage 1: without discounting'. In stage 2, the selling capitalist, S, sells this debt to the discounter for 10 to overcome the lack of means of exchange now and the risk of non-payment later. The cycle is completed in stage 3, not shown below, when B, having sold the commodities, pays money to the discounter in settlement of the debt – or defaults.[67]

[66] In this section it is assumed that the discounter is using commodity money to purchase the promise to pay from the selling capitalist. Money as a means of payment and the use and emergence of credit money are discussed in the third section.
[67] Interest payments are added to this illustration in the section 'Profit' below.

Figure 3.3: Balance Sheets and Flows of Discounter

Initial Endowment

Discounter

Assets		Liabilities	
Money	10	10	Equity

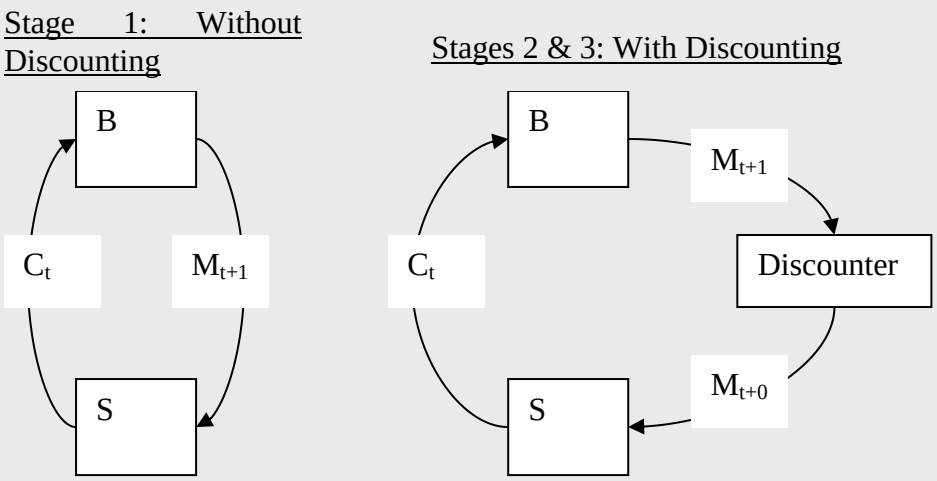
B

Assets		Liabilities	

S

Assets		Liabilities	
Commodities	10	10	Equity

The exchanges



Stage 1: S sells to B, exchanges commodities today (*t*) for payment later (*t+1*)
Stage 2: S sells the debt to the Discounter for money today (*t*).
Stage 3: B repays trade credit to the discounter at a later date (*t+1*)

After Stage 2.

Discounter

Assets		Liabilities	
Private Note$^{B}_{t+1}$	10	10	Equity

B

Assets		Liabilities	
Commodities	10	10	Private note$^{Disc}_{t+1}$

S

Assets		Liabilities	
Money	10	10	Equity

3.2.3 Specialisation

Discounters acquire three key attributes that develop as the specialist discounter emerges from other merchants and later as commercial and investment banking specialists emerge. They must judge whether the debt will be paid, taking into account their ability to enforce repayment; provide a means of payment; and be experts in the technical aspects of money-dealing. These are now explored in more detail.

Turning first to discounters' ability to judge credit risk it is necessary to note briefly the nature of credit relations in capital. Credit relies on an extension of trust – however, capitalist relations are between relative strangers. The trust required for capitalist credit is of a special kind and relates purely to the ability of the lender to secure repayment (Lapavitsas, 2003). This is grounded in the technical profitability of the borrower and their access to cash from other sources,[68] and includes assessing the legal or extra-legal social arrangements to enforce the debt. This knowledge comes naturally to businesses already engaged in regular and/or frequent relations with each other. When an outsider provides credit they must be able to make similar judgements about the ability to secure repayment without the benefit of being in the same line of business and undertaking regular and frequent acts of exchange - this reinforces the importance of the step from interacting businesses extending credit to each other to an outsider providing that credit (Lapavitsas, 2003: 77).

Second, as well as being able to judge the likelihood of repayment the lender must have cash to hand. Put more abstractly, the lender must be able to provide a generally-accepted means of payment, in the first instance of money, in exchange for a private and less exchangeable promise to pay.[69] The discounter is willing to accept credit in exchange for money where few or no other capitalists will do so – the buyer's promise to pay is not generally marketable – on the other hand the money the seller obtains from the discounter is generally exchangeable, allowing

[68] 'If the real reflux does not take place at the right time, the borrower must look to see what other sources of help he can draw on to fulfil his obligations to the lender'.(Marx, 1981: 470).

[69] The discounter provides the general in exchange for the particular. Expressing it in this way anticipates the next stage, in which the fully-formed commercial bank provides its own, more generally acceptable, promise to pay in exchange for the less-exchangeable promise to pay of the buyer/borrower.

the purchase of production inputs, and therefore the discounter must have money to hand. Third, the lender becomes a specialist in the technical aspects of handling and safeguarding money and credit.

Two examples highlight the types of specialist that may perform this function. Emphasising the need for insider knowledge about the business at hand, merchants within an industry might emerge as financiers (Kindleberger, 1984: 81). Those that have accumulated enough money to finance more than their own production cycle might prefer to lend money to other capitalists rather than, or as well as, employing it themselves (Morrison and Wilhelm, 2007). For example, some transatlantic merchants became first financiers of transatlantic trade and then major actors in the discount and bills of the London exchange market (Morrison and Wilhelm, 2007). Alternatively, money-dealing specialists who facilitate foreign payments, safeguard money and so on are well placed to provide liquidity, and moreover have a good level of knowledge of the activities of those with whom they already have money dealings (Lapavitsas, 2003: 78).[70]

Regardless of the origin, once they become specialists in advancing money, collecting information about ability to repay and enforcing that repayment, the process of specialisation continues. These firms leave their roots behind and incorporate both money-dealing and money-lending activities. For example, once transatlantic merchants become financiers they need to develop skills in book- and record-keeping, making payments, safe storage of bills and money reserves, and so on; in short, the skills of a money dealer. Money dealing and money lending effectively merge in the practice of banking (Itoh and Lapavitsas, 1999: 70). A new financial institution has emerged.

This self-reinforcing process of money specialisation can also be viewed from the perspective of other capitalists. Merchants now have no need to develop such money and finance skills as it becomes cheaper to employ specialists, further strengthening the latters' position (the typical capitalist efficiencies from division

[70] Note that here we encounter for the first time a debate over the emergence of banks from goldsmiths or merchants, which is developed throughout this chapter. At this point only the issue of the necessary skills for a money specialist is raised. Historically, however, it is worth noting that 'during the crucial years of the emergence of capitalism in England merchants were a more important source of banks' (Kindleberger, 1984: 35) – not least because there were presumably many more merchants than goldsmiths.

of labour are at work here (e.g. Marx, 1976: Ch. 14)). The developing asymmetry between banker and capitalist (Lapavitsas, 2003) adds further impetus to the process of bank development.

3.2.4 Discounter's profit

This specialisation vis-à-vis other capitalists provides the discounter's profit, a share of the additional surplus value generated with the borrowed funds. The discounter or moneylender has three sources of profit that are related to the problems solved by the lender, and the specialist skills developed and used in doing so. First, they become the economy's specialists in handling money, and the efficiencies that this affords other capitalists earn discounters a share of profits as money dealers (Marx, 1981: Ch. 19). Second, discounters lend from their own, otherwise idle, money: the exchange of a private credit (not generally exchangeable) for money (generally exchangeable) permits additional circuits of capital, producing capitalists, which earns the lender payments out of the surplus value generated. Third, by buying the debt the discounter removes a particular credit risk from the capitalist who extended trade credit, and bears that risk. When private credit is extended there is the possibility that it will not be repaid.[71] By ensuring that payment is received for a commodity sold, a new circuit is made possible, and the discounter is paid from the profits of this anticipated circuit. These three attributes address the problems of the lender and new circuits of capital are made possible, and the discounters are paid from the anticipated profits of these new circuits. In fact it is impossible to disaggregate these three abstract notions of discounter profit; none are possible in this circumstance without the others.

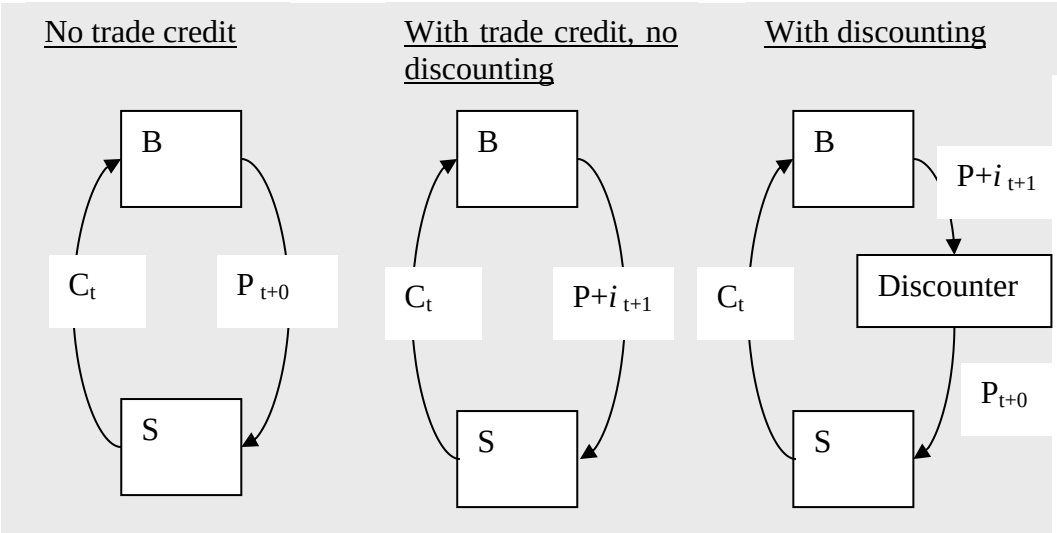
Figure 3.4 below returns to the illustration of the discounter in Figure 3.3 above with the addition of a payment of *i* to the discounter. Figure 3.4 shows that without trade credit the seller receives the cash price now; with delayed payment and no discounter they receive an additional amount, *i*. With the addition of the

[71] It can be noted that the removal of risk is particular to situations where the debt is marketable. As I show, when a simple loan is extended to the provider of trade credit the original credit risk is not removed from the lending capitalist's balance sheet, although the bank also takes on credit risk. When a security is bought, the new lender bears the risk of the default of the ultimate borrower; the bank as market maker removes the risk from the security seller and bears it until they in turn sell the security.

specialist discounter this is split, with the seller receiving the cash price now while the specialist discounter earns *i* by advancing money today and being repaid later.

In the second scenario, presented in Figure 3.4, the selling capitalist, S, advances commodities now against a promise to pay money in the future. Competition should ensure that the price for accepting payment in the future is greater than that for accepting payment now; moreover once discounting is established this difference equals the discount. Therefore it is possible to express the delayed payment from B as the sum of the cash price plus interest. When S sells the private credit to the discounter (as shown under 'With Discounting', below), the seller, S, receives the cash price of the commodities as the discounted price of the debt and the buying capitalist, B, pays the cash price plus discount, expressed here as the interest, *i*.

Figure 3.4: Discounter's Profit



- No trade credit: commodities exchanged for the cash price today.
- Without discounting : Seller receives cash price, P, plus interest, *i*, at t+1
- With discounting: Seller receives cash price now by selling the debt. The discounter advances the cash price, P, now and receives P+*i* upon redemption of the debt at t+1

3.2.5 Interest and interest-bearing capital

The payment that the discounter receives is interest, and the discounter's money capital when used in this way is interest-bearing capital (IBC). The form of the discounter's profit at first sight differs from the basic explanation of interest, and it is worth taking a moment to explore this in more detail, not least because this discussion of the form and content of commercial banks and securities dealers requires it.

For Marx, interest is specifically a share of surplus value generated. If a capitalist with money advances it to another capitalist, who puts it to work and then later repays with an increment from a portion of the profit produced, the increment is interest. As Marx states:

> What [the borrower] pays for with this is the use value of the [money advanced], the use value of its function, the function of producing a … profit. The part of the profit paid in this way is called interest, which is nothing but a particular name, a specialist title, for a part of the profit which the actually functioning capitalist has to pay to the capital's proprietor, instead of pocketing it himself (Marx, 1981: 460).

Although similar, the form of the discounter's profit does not appear to exactly resemble the basic forms of interest described by Marx. Several aspects appear to diverge from the simplest forms of interest, most notably because the interest is expressed as a change in the price of a marketable debt, and secondly because money is advanced to one capitalist and repaid by another.

These slight differences in form are misleading, however, as can be shown by examining the discounter's money capital as IBC. As Lapavitsas (1991: 307) states, the purchase of the discounted debt '…is in reality the advance of interest-bearing capital, commanding the payment of the rate of interest as expressed in the discount rate'.[72]

[72] Lapavistsas, following Hilferding (1981: Ch 5), is discussing discounting using credit money, but the same holds for the simpler analysis with commodity money.

> [M]oney … can be transformed into capital, and through this transformation it is turned from a given fixed value into a self-valorising value capable of increasing itself. It produces profit i.e. it enables the capitalist to extract and appropriate for himself a certain quantity of unpaid labour, surplus product and surplus value. In this way the money receives, besides the use-value which it possesses as money, an additional use value, namely the ability to function as capital. Its use-value here consists precisely in the profit it produces when transformed into capital. (Marx, 1981: 459-60)

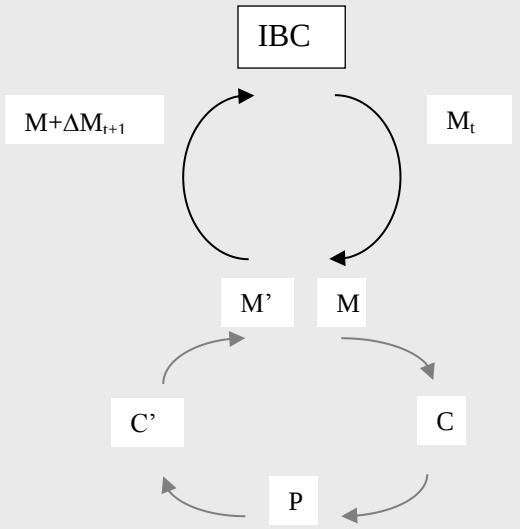
In this light the money that the discounter uses to buy trade credit is IBC, and earns interest. The discounted transaction represents the advance of money to producing capitalists in general (capital as a whole) now for repayment later; this advance and repayment facilitates additional circuits of capital, thereby generating surplus value from which the discounter is paid – in short an M-M' circuit.[73] The discounter's profit is from interest, and it is of secondary importance that interest is paid via the purchase and redemption of a promise to pay and involves more than one capitalist. I return to this, i.e. marketable debt, when considering securities trading in the next chapter, where the similarity of form masks a difference in content and a more complex source of profit.

IBC is the most highly-fetishised form of capital (Marx, 1972: 453.5) that separates the advance of money now for return plus an increment later (i.e. M – M') from the rest of the mediating circuit of capital (Marx, 1981: 468). As Figure 3.5 below highlights, the separation from the mediating circuit means that IBC is not particularly concerned how or by what means it is repaid, just as long as it is repaid, thus the underlying process that provides repayment can be production or something else, and in the case of the discounter's repayment can be from the

[73] In the definition of interest used above and taken from the opening paragraphs on interest-bearing capital, Marx states that money takes on the additional use value of being able to 'function as capital' and has a use-value consisting of the 'profit that it produces when transformed into capital'. He continues: 'In this capacity of potential capital, as a means to the production of profit, it becomes a commodity, but a commodity of a special kind. Or what amounts to the same thing capital becomes a commodity' (Marx, 1981: 459-460). It follows that markets for capital as commodity can develop and an exchange value emerge. Indeed in the note to this passage Marx notes use of the term 'dealers in the commodity of capital' applied to the Bank of England. This would seem to add further support to the argument that the discount can be considered interest. (Marx, 1981: 459-60)

seller or the buyer as long as repayment is achieved.[74] The linear notation of IBC – and debt more generally, i.e. M - M' – captures its fetishised nature and disconnection from underlying processes.

Figure 3.5: Circuit of capital with interest bearing capital



Interest-bearing capital is both connected to and separate from the circuit of production. Lenders are not particular about whether their advance is repaid from the sale of commodities or from elsewhere.

3.2.6 Constraints

The growth of such a credit system is constrained by the capital that discounters can accumulate; to break these constraints the discounter (becoming a bank) needs to be able to source and then leverage additional funds. Marx can be said to adopt 'two approaches to the concept of interest bearing capital' (Lapavitsas, 1997): in one, lending occurs between 'monied' capitalist and 'functioning' capitalist, as largely laid out in Marx's (1981: Chs. 21-4) analysis of IBC. At the current fairly simple stage in the development of the logic of banking it is sufficient to focus on the financial specialist's relationship with borrowers in the style of monied and functioning capitalists; the monied capitalist is able to earn a share directly from the surplus value generated by the functioning capitalist.

[74] Indeed, as I show regarding securities trading, completion of the M-M' circuit can also be completed with the sale of the debt.

Marx's second approach stresses the collection and recycling of idle funds occurring naturally in the course of production and elsewhere in the economy (e.g. Marx, 1976: Ch. 3, Marx, 1978) and introduces the idea of loanable money capital (LMC) (Marx, 1981: Chs 30-2). To overcome the constraints of the discounter, and for commercial banking to emerge, the analysis must expand from the first to the more complex second approach, turning to the ways in which, through the processes of specialisation already underway, a bank is able to make use of funds other than its own.

3.3 Commercial banking

This section develops an understanding of commercial banks, building on analysis of specialist discounters emerging from other merchants. Commercial banks make use of the same skills as discounters, but develop them to produce bank credit money, and in doing so apply them across a much larger network, forming a many-to-one relation on both the asset and liability sides of the balance sheet. Expanding the analysis from discounting shows how banks make use of credit money to engage in the lending of 'circulation credit', thus granting greater efficiency to the use of a given stock of commodity money. From there, banks systematically collect and on-lend money (Lapavitsas, 1997) which has fallen idle in various places and at various times in the circuit of capital (Lapavitsas, 2000b) and elsewhere in the economy (Marx, 1981: Ch. 32).

The section notes how some theories of banking start with this, the appearance of banking in its developed form, but, lacking the analytical foundations behind appearances, are unable to present a holistic theory of banking incorporating theories of both credit money and banking. In the theory presented here, credit money and banking are two sides of the same coin. Approaching banking in this way provides a theory that can be expanded to incorporate new specialities including derivatives dealing. This more-developed form of credit institution is now a bank, and cannot be analysed simply as a lender; instead the workings of and return to bank capital must be analysed. Among other things, this means analysing the way banks (and the credit system more generally) transform idle money into loanable money capital (Marx, 1981: Chs. 30-32).

This section outlines in more detail first how the analysis expands from the activities of discounters using banknotes (section 3.3.1), and second, how this expands to the systematic collection of deposits (section 3.3.2). Third, it briefly discusses this approach to banking in light of other theories (section 3.3.3), before fourth, turning to the limits that arise on the expansion of banking from these activities (section 3.3.4) and fifth, the ways in which banks profit from them (section 3.3.5). In this way it gives content to the intermediation provided between lenders and borrowers and establishes the bank as a specialist, obtaining a return to bank capital and capable of becoming a derivatives dealer. Finally it examines how, from the perspective of the bank, the nature of money, interest and banking puts borrowing and lending outside production on the same footing as borrowing from or lending to production itself (section 3.3.6).

3.3.1 Banks emerge from discounters – private bank notes and circulation credit

Commercial banking and bank credit money arise logically from the processes of production and exchange. In the logical development outlined so far, delayed payment in exchange (commodities now for money later) gives rise to discounters. The emergence of bank credit takes up this story, turning first to circulation credit and the use of bank credit money to fund these delays of payment. Bank involvement in short-term circulation credit lays the foundation for the analysis of deposits and then of longer-term lending funded by short-term deposits, as explained in the next subsection.

In the analysis so far, a discounter exchanges a private promise to pay for money. The analysis now becomes more complex, and the discounted bill is exchanged for a second promise to pay issued by the finance specialist, who is now en route to becoming a bank proper. This progression can be split into two phases.

In the first phase, the buying capitalist's private promise to pay is itself used to pay for commodities; i.e. instead of selling the bill of exchange to the discounter, the original commodity seller passes it to another producing capitalist as payment for bought commodities. This requires a wider social acceptance of the original buying capitalist's creditworthiness than is necessary in simple discounting,

however its acceptability is likely to be limited to those in the same business or supply chain, or those with knowledge of the original buyer's business. The ability to transfer the credit, or 'negotiability of the long established foreign bill of exchange [is] created with serial endorsements' (Neal, 1990: 7). These notes are signed by a chain of capitalists with 'long strings of endorsements' (Kindleberger, 1984: 79). Once the debt falls due, the payment of money passes back along the chain, with money acting as a means of payment.[75]

In the second stage, the buying capitalist's promissory notes are replaced by those of a specialist merchant whose notes are more widely and generally accepted, this specialist merchant is the emerging bank. One way that this comes about is that the specialist (the discounter *en route* to becoming a bank) buys the original trade credit from the seller of commodities, not with money but with its own promise to pay (a banknote).[76] This promise to pay becomes generally accepted and so can act as a means of payment in commodity exchange. The note sets off on a random path of commodity circulation as a means of payment, but when it falls due, payment flows from the bank to the last selling capitalist holding the note (and not back down the chain of capitalists, as with the promissory note). In order to ease the path of its wider social acceptance as a means of payment, the banknote becomes redeemable on demand at the bank.[77] In this way banknotes as 'signifiers of debt became completely *depersonalized* (that is, payable to 'X' or

[75] Ingham splits this into two further stages: first, bills of exchange 'became detached from the existence of any particular commodities in exchange and transit, and were used as pure credit between traders. Later, in a crucial further stage of dislocation, bills become detachable from the particular individuals named in the creditor-debtor relation. Signifiers of debt became transferable to third parties, and could circulate as private money within commercial networks' (Ingham, 2004: 108).

[76] The banknote referred to here is a private banknote. Banknotes today are typically taken to mean only those issued by central banks. Private banknotes meanwhile have largely become replaced by electronic deposits and payments systems.

[77] Note that this is not fiat money, which is explicitly stamped as a socially accepted symbol of money, usually issued by the state as the only institution that can impose such acceptability. Banknotes, by contrast, are private credits that become socially acceptable by actions of banks and capitalists (through processes outlined in this chapter). The emergence of a central bank with a monopoly of note issuance is a often historically key moment in the establishment of bank credit money as a means of payment, however this fiat is built on, and extends, existing social practice (Kindleberger, 1984). For some post-Keynesians the role of the state in collecting tax in money, creating a space for money and creating public banks is more essential as it can fuse private credit money and public metal coinage (Ingham, 2004: Ch. 6).

‘bearer’) and [are] issued as bank money; … the promises to pay drawn on banks became a widely accepted means of payment’ (Ingham, 2004: 108).[78]

Figure 3.6 illustrates the transactions. The only initial endowment is to the selling capitalist,” and consists of commodities for sale and corresponding equity or net worth.[79] In stage 1, as previously, commodities are sold to the buying capitalist, B, in exchange for a private promise to pay later. In stage 2, this private promise is sold to the discounter; however, the payment is made from the discounter to the seller not in money but in a claim to money: a banknote. After stage 2, balance sheets show a completed exchange, with the banknote acting as money and the emergence of a recognisable bank balance sheet.

Figure 3.6: Balance Sheets and Flows of Discounter with Banknotes

Initial Endowment

Discounter

Assets		Liabilities	

B

Assets		Liabilities	

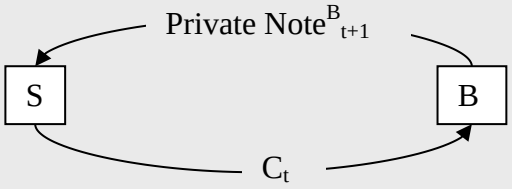
S

Assets		Liabilities	
Commodities	10	10	Equity

[78] Note that in the third section, below, considerably more attention is given to the way in which these ‘signifiers of debt’ become ‘bank money’, and, I argue, are connected with and stem from the various functions of money, being not only confined to a ‘means of payment’. This view, building from commodity money, conflicts with Ingham’s view of money despite accounts agreeing on certain aspects of the appearance of bank credit money (Ingham, 2004).

[79] Note that in Figure 3.3 the discounter also requires an initial endowment of money. In 3.4 this is not required. As the analysis will show, the bank lends a promise to pay that act as money.

Stage 1: S sells to B using trade credit, i.e., exchanges commodities today (*t*) for payment later (*t+1*).



After Stage 1

Bank

Assets		Liabilities	

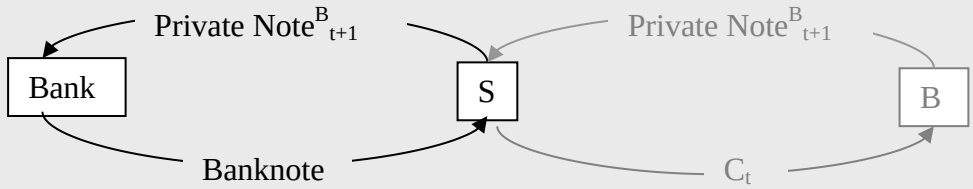
B

Assets		Liabilities	
Commodities	10	10	Private Note$^{B}_{t+1}$

S

Assets		Liabilities	
Private Note$^{B}_{t+1}$	10	10	Equity

Stage 2: Bank buys from S the private promise to pay of B using its own promise to pay, i.e. a banknote.



After Stage 2

Bank

Assets		Liabilities	
Private Note$^{B}_{t+1}$	10	10	Banknote

B

Assets		Liabilities	
Commodities	10	10	Private note$^{B}_{t+1}$

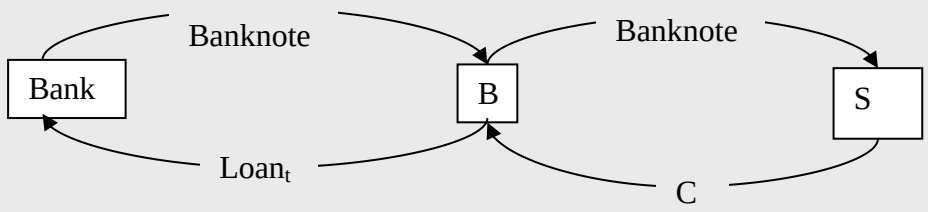
S

Assets		Liabilities	
Banknote	10	10	Equity

With the establishment of the generally-accepted private banknote, an alternative transaction becomes possible. B, instead of issuing a private promise to pay the seller, S, first borrows banknotes directly from the bank and then uses them as money to purchase commodities from the selling capitalist with no credit relations between buyer and seller. Figure 3.7 illustrates these transactions and shows the balance sheets that result from them (note that B and S have switched places compared to Figure 3.6). The resulting balance sheets are exactly the same as in the case of the purchase of discounted private credit from the seller using banknotes, the private note in Figure 3.6 being replaced by a loan from the bank in Figure 3.7, a matter of nomenclature, as both are private and particular promises to pay on the part of B.

Figure 3.7: The commodity buyer borrows banknotes

<u>Alternate Stage 2:</u> Bank lends bank notes to buyer directly.



<u>After Alternate Stage 2</u>

Bank

Assets		Liabilities	
Loan$^{B}_{t+1}$	10	10	Banknote

B

Assets		Liabilities	
Commodities	10	10	Loan$^{Bank}_{t+1}$

S

Assets		Liabilities	
Banknote	10	10	Equity

The bank has used its specialist attributes to create a banknote, and in doing so it bears the risk of non-payment by the buying capitalist and provides the selling capitalist with a means of payment. The banknote solves the same problems as those solved earlier in the analysis by the discounter. They achieve this via the banknote because as a claim on the bank to money, it acts as money, making possible additional circuits of capital: the seller can use it to start a new circuit of capital before (delayed) payment arrives for the last, i.e. before the buyer has completed hers.[80] As a result the bank earns part of the additional surplus value generated in the form of interest, as discussed later. Through issuing claims to money that act as money, banks increase the efficiency of money in the economy. To continue the examination of the process of development of commercial banks it is necessary to examine bank deposits.[81]

3.3.2 Deposits and the emergence of investment credit

The possibility for deposits arises because of the disconnect that money creates between purchase and sale (acting in this way as the flipside to credit) and because of the leads and lags in production. Money falls idle and the capitalist is able to deposit it in an established banking system and earn interest. This idle money may be in the form of banknotes, as seen above, or it may be commodity money.

[80] It should be noted that selling the debt for money removes all credit risk from the selling capitalist's balance sheet and the bank alone bears the credit risk of the buyer. By issuing banknotes the bank still bears the buyer's credit risk, but has not removed all credit risk from the seller's balance sheet. For the seller, the banknote makes possible a new circuit by acting as money, but does not remove all credit risk from the seller's balance sheet. Instead the risk of non-payment by the buyer is transformed into risk of non-payment by the bank. As I will show, general acceptance as a means of exchange is bound up with general acceptance of banks' ability to repay.

[81] Historically in England, in the second half of the 19th century merchant banks in London advanced money as working capital to capitalists by discounting bills of exchange, the funds for which they borrowed on short terms in the money market from commercial banks, who in turn collected deposits (Langley, 2002: 56). 'A manufacturer sells his product for a bill of exchange and discounts this bill with a billbroker. But in actual fact the latter only advances his bankers credit, and the banker in turn advances the money capital of his depositors, who consist of the industrialists and merchants themselves, though also including workers (by means of savings banks) as well as landlords and other unproductive classes' (Marx, 1981: 615). The functions have been developed logically separately but it can be seen that historically they coincide. Similarly, the analysis moves through banks' expanding functions in turn as they expand to include discounting, commercial banking *and* investment banking.

Deposits are 'simply a particular name for loans that the public make to the bankers' (Marx, 1981: 603). In return for such a loan the bank issues a promise to pay. However, the public may also require access to their money at short notice. As with banknotes, deposits must be of short maturity or even available on demand.[82] Partly in this way and partly through banks' reputation for creditworthiness these bank liabilities function as money, a private promise to pay that becomes generally acceptable as money. Faith that the claim to money will be honoured allows the claim itself to function as money. In fact: 'Deposit credit money is not qualitatively different from private banknotes – merely another type of bank liability issued in the normal course of the bank's business' (Lapavitsas, 2000a: 637).

In addition to deposits created through the collection of commodity money, the lending of banknotes, discussed above, creates deposits of credit money. Issuance of a banknote creates a liability on the bank's balance sheet. If a capitalist does not spend all of an advance of bank credit money (banknotes in the illustrations above) she effectively makes a deposit at the bank; if she spends it another capitalist takes possession of the bank's liability, thus effectively holding a deposit at the bank.[83] As banknotes become money, lending by issuing banknotes results in (credit) money deposits.

Figure 3.9 below illustrates both sorts of deposit creation. A capitalist, P is initially endowed with 10 of idle money and corresponding equity; this is deposited at the bank in exchange for a promise to pay on demand (a deposit). Separately, the bank lends banknotes to another capitalist, Q. Now both P and Q hold redeemable-on-demand bank liabilities which can serve as money in commodity exchange. Both the act of receiving money and the act of lending have created deposits.

[82] The leads and lags of production cycles can produce excess cash for deposit at times but at others can equally demand cash, potentially at short notice (Lapavitsas, 2000b).
[83] Electronic deposits of banks in 2013 are nothing more than a promise to pay by the bank.

Figure 3.8: Commercial Banking

Initial Endowment

Bank A

Assets		Liabilities	

P

Assets		Liabilities	
Money	10	10	Equity

Q

Assets		Liabilities	

Transactions

P deposits Money at Bank A in exchange for a promise to pay by the bank.

Q borrows from the bank, accepting the banks promise to pay in exchange for their own promise to pay.

Balance sheets after transactions

Bank A

Assets		Liabilities	
Money	10	10	BN^P_0
$Loan^Q_{t+1}$	10	10	BN^Q_0

P

Assets		Liabilities	
BN^A_0	10	10	Equity

Q

Assets		Liabilities	
BN^A_0	10	10	$Loan^A_{t+1}$

With the systematic collection of deposits, the banking system becomes fully established and takes on the appearance of the commercial bank. The issuance of claims to money that act as money makes more efficient use of the money in society, which Hilferding calls ‘circulation credit’ (1981: Ch. 5). In addition, systematic deposit collection allows the emergence of what he terms ‘investment credit’ (1981: Ch. 5). Investment credit is the extension of longer-term loans, e.g. for the purchase of fixed capital that will operate over more than one circuit of production. The foundations for investment credit are provided by the systematic

creation and collection of deposits. This activity grows out of. but is qualitatively different from circulation credit.

The discounter analysed in the previous section lent his own money. The money capital lent took the form of IBC. The bank which has emerged from the subsequent analysis additionally collects money from around the economy that would otherwise be idle and sends it forth on circuits of production. This is a more complex role that gives this otherwise idle money a more complex form of money capital than IBC: loanable money capital (Marx, 1981: Ch. 30-32).

3.3.3 A merchants theory of banking capital

The theory above began with simple categories and the simple circuit of production and developed them logically to arrive at an approximation of the appearance of commercial banks. Contrasting banking theories that start with the appearance of commercial banking but do not investigate the processes by which that appearance came about usually fail to capture a full understanding of commercial banks (e.g. by concentrating only on particular aspects); allow little scope for an evolving understanding of these institutions as they continue to change, including to incorporate securities and derivatives dealing; and struggle to incorporate both bank borrowing/lending and the formation of bank credit money in the same theory, with one assumed in order to explain the other.

More generally, theory that fails to penetrate the appearance of bank activities tends to invert the nature of banking. One critical way in which this occurs is by arguing for the creation of lending from deposits and not for the creation of deposits from lending.[84] Such approaches can be characterised as a goldsmith's view of banking in contrast to the specialising merchants' view presented here. In the goldsmith's view, banks are lenders via a rather passive intermediation, aggregating idle money from 'innumerable small puddles, where it stagnates' (Schumpeter, 1954: 319) and passing it on to those 'spending units with deficit budgets' (Gurley and Shaw, 1955: 516). A graphic analogy is provided by Cannan (1921), who casts the banker as a cloakroom attendant who collects and then on-lends cloaks, the presence and workings of the attendant making

[84] Inversion might be thought to be typical of ideology, e.g. Larrain (1991) and Fine (1980).

society's use of coats more efficient as X is able to make use of a coat while Y has no need of it.[85]

Much of the explanations of banking provided by the neoclassical micro-foundations literature over the last 30 years or so can be seen as goldsmith or cloakroom attendant theories of banking. In these theories banks arise as a result of a specified market imperfection that prevents surplus units meeting deficit units in the market. Banks (the lending library or cloakroom attendant) emerge as a second-best solution. When asking 'Why do financial intermediaries exist?', Freixas and Rochet (1997) group theories under 'transaction costs' (e.g. Benston and Smith Jr, 1976), 'liquidity insurance' (e.g. Bryant, 1980) 'information-sharing coalitions' (e.g. Leland and Pyle, 1977), and 'delegated monitoring' (Diamond, 1984). As the grouping implies, these theories tend to take single aspects of a bank's appearance and transform it into the sole reason for the bank's existence.[86]

One aspect of this approach to banking theory is that the theories do not require the creation of bank credit money; in fact, as the analogies suggest, the unit being borrowed and lent could be anything from books to coats. Given a stock of money, whether bags of gold, fiat money or credit money, simple collection and on-lending is indeed what banks appear to do; but can it be that banks simply speed up the use of money? In that case it is an increase in velocity 'so great that it enables a thing to be in different places at the same time'[87] (Schumpeter, 1954: 320). As I have shown, the bank increases the efficiency of society's use of money by issuing (and sustaining) claims to money, i.e. notes and deposits. The fact that it is a claim to money matters: a claim to money is qualitatively different from a claim to a commodity (Schumpeter, 1954: 1114). A claim to money can act as money; a claim to a coat cannot act as a coat.[88]

[85] The lending library offers another, slightly different, analogy.
[86] As outlined in the methodology chapter, this thesis argues in favour of a process of development with multi-directional, multi-determinant logic rather than the static and mono-causal logic of these theories.
[87] 'The fact that sales take place simultaneously and side by side limits the extent to which the rapidity of turnover can make up for the quantity of currency available' (Marx, 1976: 235).
[88] Schumpeter (1954: 1114) notes: 'A claim to sheep does not increase the number of sheep'.

It is *only* by creating and sustaining claims to money which act as money that money can be in two places at the same time: only this method is flexible enough to coordinate the economy's variety of rhythms of saving and borrowing; and only in this way can the borrower and the lender simultaneously have use of the benefits of money. Because the rhythms of production determine when, where and for how long money falls idle (as they do for the requirements of borrowers), depositors require access to their money at short notice (as do borrowers). Credit money is a device, developed from maximising the efficiency of means of payment, which gives depositors and borrowers access to a given amount of money at the same time. It is this that gives banks the appearance that goldsmith theories seek to explain as the collection of idle money, now credit money, for lending on elsewhere.[89] The bank that emerges in the merchant's view, however, lending, creating bank money and collecting otherwise idle money, provides a richer theory of banks and one that develops the idea of bank capital as a particular capital which uses its specialisation to take on new activities.

3.3.4 Constraints

Although money might be said to be 'qualitatively … independent of all limits' (Marx, 1976: 230), limits on the size of the banks' balance sheets arise from their activities. Credit money creates deposits from loans, and threats to the ability of credit money to act as money arise from both sides of the banks' balance sheet. These threats can be characterised as risks to solvency, generally concerned with repayment of loans; and risks to liquidity, generally concerned with the withdrawal of deposits. A problem with one will usually lead to a problem with the other. For the banker, this threat to his existence places constraints on the type and amount of his activity.

Commercial credit might be thought to be more associated with liquidity risks than solvency risks and risks to a bank's liabilities.[90] As it is used to facilitate

[89] In another variant of the goldsmiths view of theories of banking, many theories of the financial sector in general can only envisage either money or credit, and not both, as the crucial factor in bank activity (e.g. as surveyed by Gertler 1988)

[90] Lapavitsas highlights traces of Smith and Steuart in Hilferding's treatment of banks. Banks in Hilferding start Smith-like (focussed on providing commercial credit with less maturity mismatch to make more efficient use of the money available) and become more Steuart-like (providing longer-term credit against secure but illiquid assets to put more money into the economy).

exchange, solvency is generally less of a problem than liquidity: further exchange of the commodity provides the means for repayment. With commercial credit, claims to money support a much greater volume of transactions in a given period than would be possible with only (commodity) money. This is at once the aim and the weakness of circulation credit. If too many banknote holders try to exchange their claim for money at the same time, the bank's ability to provide a means of payment is jeopardised. This potential problem constrains banks' activities: they cannot lend out all the deposits they hold; they must have money to hand, reserves that can be paid out on demand (e.g.Harvey, 2006: 279). A lack of arrangements such as clearing houses, which support credit money but require bank cooperation, can act as a further constraint on banks.

Liquidity constraints are also observed in micro-foundation theories of banking from the 1980s onwards, which use market imperfections to explain observed features of banking. Such theories reason that in perfect markets, liquidity would not constrain bank activity (Black, 1975). Micro-foundation theories provide explanations for anomalies between observed outcomes and those predicted by efficient market theory. By assuming imperfect liquidity, it is possible to create less liquid instruments through differentiated payoffs (Diamond and Dybvig, 1983). This creates room for banks as second-best solutions compared to perfect markets, but the most efficient solution given an assumed imperfection. In this case, however, the bank has an unstable equilibrium and, unless confidence is maintained, a bank run is possible. This can be resolved by the suspension of conversion or deposit insurance – the latter unsurprisingly proving more efficient, as it provides a more market-like solution (ibid.).[91] More recent theories continue to create illiquidity with altered pay-offs, e.g. between direct and indirect finance and in the absence of credit money (Diamond and Rajan, 2001).

On the other side of the balance sheet, solvency provides another constraint. As banks increase the maturity mismatch in their balance sheets and begin to provide investment credit, the emphasis shifts to the intertwined nature of credit money

Moreover, for Smith-like banks, liquidity is more of a concern, while for the land- and development-banks of Steuart, solvency is more of an issue (Lapavitsas, 2004).

[91] Credit money does not form part of the analysis, and little differentiates the bank from the on-lending cloakroom attendant – the bank merely brings efficiencies to the use of a given supply of money.

and lending. Long-term lending with credit money is a means of turning assets that produce surplus value over time into the form of money today – or vice versa, turning money today into assets that produce surplus value over time. When lending banknotes against illiquid assets in order to create liquidity, there is less reason to worry about people drawing down money against banknotes and more reason to worry about assets turning bad. If the bank's credit analysis skills fail, repayment of the loans they have made is threatened. An insolvent bank can stay in business longer than an illiquid one, if its liabilities continue to circulate, but eventually it will lack the means to honour liabilities as they fall due, creating liquidity problems. A second constraint on banks' activities therefore arises from risks to solvency: banks must restrict their credit to projects that appear to offer a secure return.

Once again, such behaviour is observed in banks, and in neoclassical theory it is therefore necessary to invent market imperfections to explain it. Efficient markets leave no space for credit rationing by unregulated banks (Black, 1975). For Stiglitz and Weiss (1981), information asymmetry is assumed and made into a determining factor for the bank's existence rather than one result of bank specialisation. In their model, the price of loanable funds does not necessarily produce a market-clearing equilibrium, and a credit-rationing equilibrium can occur because price affects loan riskiness.

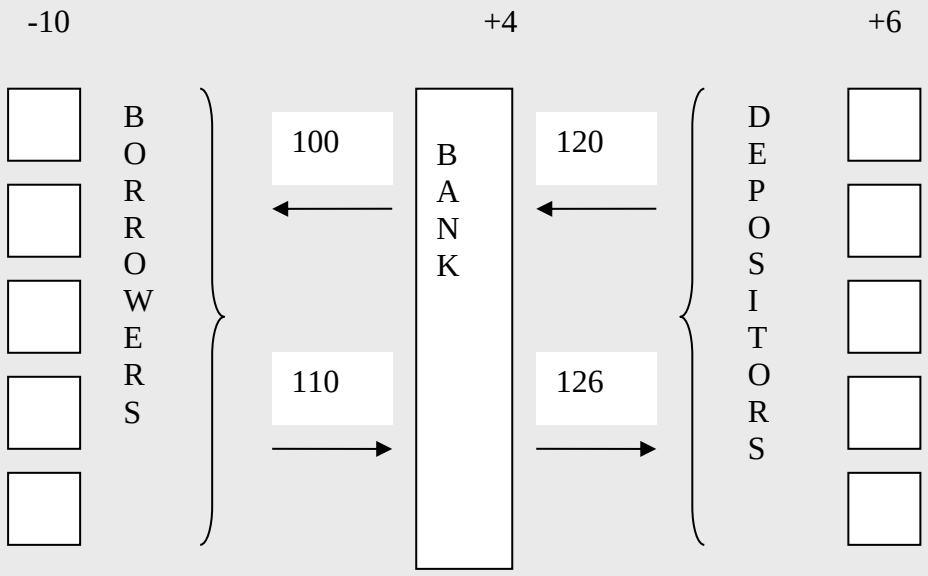
3.3.5 Profits

I have shown above how, notwithstanding the constraints on their activity, commercial banks use the device of credit money to increase the amount of money acting as capital and generating surplus value. By enabling claims to money to act as money, the efficiency of money in exchange is increased, enabling additional circuits, and money falling idle in one production process can be used in another. Banks profit mainly by claiming a share of this additionally-generated surplus value.

Simply put, banks profit from receiving more in return from borrowers than they repay to depositors. Figure 3.10 below illustrates how this profit arises. It assumes that the total lent and total stock of deposits remains constant over the

period. The bank takes in a net total of 10 from borrowers and pays out 6 to lenders, retaining 4 for the intermediation or mobilisation of money, or, put another way, for facilitating the transformation of money into loanable money capital.

Figure 3.9: Banking Profits



Borrowers pay 10% interest on 100 lent. Lenders appear to be paid 5% on 120 lent. Banks maintain a reserve of 20, supplemented by a profit of 4.

Alternatively configured lenders might be said to be paid 10% on 114.45 by the bank with a fixed payment deducted from their idle money of 5.54; alternatively borrowers might be argued to pay 5% interest and a fixed amount of 5 deducted from their surplus value.

Returns to banking capital stem from banks' intermediation, which increases the amount of money acting as capital and cannot be explained only as simple lending; correspondingly the more general concept of loanable money capital and its emergence is more useful than IBC for locating banking profits: '[T]he money capitalist makes the savings of other people into his capital, and the credit that the reproductive capitalists give one another, and that the public give them, he makes into his own source of enrichment' (Marx, 1981: 640).

Money as capital has the additional use value of extracting surplus value, of self-valorisation; banks enable this additional use value and are paid both by lenders and borrowers for doing so. 'The profit that forms the source of accumulation for these money capitalists is simply a deduction from the surplus value that the reproductive agents extract (as well as an appropriation of part of the interest on the savings of *others*)' (Marx, 1981: 634). Banks allow the money of those with idle funds to act as capital by enabling those wishing to hoard to simultaneously earn a share of surplus income and maintain liquidity. As bank credit money becomes the most established form of money, it also becomes the most convenient liquid form in which to hold wealth, whether in banknotes issued as a loan, as above, or in its modern electronic form as entries in computer systems.[92] Banks provide loans to those in need of funds, allowing the creation of surplus value. In doing so they permit the production of more surplus value than would otherwise be possible in a certain time period, and claim a share of it.

Bank profit takes the form of interest, reflecting the form of loanable money capital, but the similarity of form with discounters' profits masks a difference in content. In fact the form of commercial bank profit is partly a result of habit in the way it is expressed. Bank profit is usually configured as the difference between the borrowing and the lending rate on the same notional amount. In fact, as illustrated in 3.9 above, bank profit might as easily be configured as a difference in notional amount, using the same interest rate, where the difference in notional amount is paid as a lump sum by either lenders or borrowers. For example, the repayment of depositors, instead of being at a lower rate, can be expressed as the same rate as the borrower's but on a lower notional amount, the implication being that some of the depositors' money is paid over as a lump sum; conversely, borrowers might pay the same lower rate that lenders receive plus a lump sum (recall that banks must keep some cash in hand).[93] The point is not to deny that commercial bank profit takes the form of interest, which it does, and

92 In a world dominated by electronic bank credit money, the alternatives to storing idle money as bank deposits decrease, and correspondingly, pressure on banks to pay depositors decreases.

93 Illustrations of bank profit throughout this chapter are given as money amounts. It is straightforward to reconfigure illustrations as rates, for example using the formula for continuous compounding, e-r.t, where r is the rate, t is time and e, the exponential; it is then possible to express bank profit as a spread between r_{loans} and $r_{deposits}$, the rates on loans and deposits respectively. However, to emphasise the ambiguous sources of bank profit and for simplicity of presentation, a monetary amount convention is followed.

which is important in itself, but that the form of the profit is not enough to reveal the content of the activity, namely intermediation and not simple lending.

A comparison of the form and content of the profits of discounters and commercial and investment banks further establishes this point. Discounters, as discussed above, earn interest for simple lending from their own funds in the form of purchasing discounted bills. Banks, by contrast, do not, in the main, lend their own money. They claim a share of surplus value on their own capital because their intermediation allows other capitalists to generate additional surplus value. Their profit, however, takes the form of interest. In the next chapter I show how banks as securities market makers also earn a share of surplus value for bank capital by facilitating the collection and on-lending of money, but here the market maker's profit appears to take the form of a fee which is more akin to discount than to interest. The differences in form between discounting and commercial and investment banking profit somewhat cloak the similarity of content between the latter two and their difference from the first.

Neoclassical approaches to banking might be thought to consider banking as two separate but essentially similar lending operations. Analysis starts with an ideal market rate at which borrowers meet lenders.[94] Two loans then occur – typically because some market imperfection prevents markets working – one from depositors and one from the banks. Relative to the ideal, but non-existent, market rate, the bank is able to borrow more cheaply from depositors and lend more dearly to borrowers.[95] The problem with this conception of the world is that the starting point for analysis of the bank's profit is to assume away the bank. It considers bank profits in light of a non-existent market for matching borrowers and lenders. This is an ideal and illogical approach. I argue here that the lending occurs because the bank exists, and that bank capital, as both property and process, earns a reward for facilitating this lending.

[94] The UN recommends measuring the difference between lending/borrowing rates and a reference (mid-)rate when measuring bank activity for inclusion in national accounts (United Nations, 1993). Banks' ability to price each side away from the reference rate is then taken as subject to competition and as fair reward for a service provided, e.g. bearing a risk.

[95] A parallel is shown to exist when discussing bid-ask price spreads in securities and derivatives markets. Reference is often made to a (non-existent) mid rate and dealer profit conceived relative to this ideal. Starting from the more realistic proposition that the market does not exist without the dealer/bank removes the possibility of theorising bank activity in this way.

Banks earn a share of general surplus value as a particular capital (capital as property) with its own specialisms (capital as process). They further develop the specialist skills of discounters and add a large network of borrowers and lenders: specifically they bear risk and provide liquidity, and to do this they must handle the technicalities of lending. In practice these activities are intermingled. Nor is the process of intermediation passive, but bank capital must be constantly put to work to maintain this claim to surplus value, and in particular the role of credit money as money must constantly be reproduced, for example by maintaining confidence in the bank's portfolio of assets (see the section on money below).

As usual, neoclassical theory tends to observe these specialisms but, failing to penetrate appearances, makes them the *raison d'etre* of the bank. So, for example, theories recognising the banks' specialist credit skills attribute their existence to information asymmetry (e.g. Diamond, 1984); theories recognising the importance of liquidity theorise their existence on this basis (e.g. Diamond and Rajan, 2001); and the same goes for theories recognising their money-dealing skills (e.g. Benston and Smith Jr, 1976).

3.3.6 Lending to and borrowing from outside production

Banks are able to expand their amount of loanable money capital by borrowing from and lending to processes other than circuits of production (as described in section 3.2). Indeed this ability is in the very nature of loanable money capital and therefore of banks as loanable money capital dealers. Banks collect money from wherever it is used, both in and out of production, to transform into loanable money capital. At the same time they are both connected to and outside the circuit of production; their loans facilitate circuits of production but are not of the circuit of production. Turning first to the sources of funds, it is principally the nature of money that facilitates its collection by banks.

As the credit or financial system is established, banks collect otherwise idle hoards from all over the economy, and not just from production. As the banking system becomes established and money comes regularly to serve as capital, it becomes capital even before it has been advanced as capital: it is 'latent, potential capital' (Marx, 1981: 477) in anticipation of being put to use. Once a banking

system is established, and indeed once bank credit money comes to the fore, banks naturally collect all money holdings, not just those arising in production, as deposits. Hoards naturally seek out self-valorisation by being quite normally collected by the banking system. Therefore idle hoards, although initially transformed into loanable money capital, become capital automatically via the mediation of an established banking system.[96]

> [Revenues that are only] gradually consumed [whether they are that part of surplus value that the capitalist accumulates or spends for his own consumption, or whether they are] ground rent, the higher forms of salary, the incomes of the unproductive classes etc. All of these assume for a time the form of money revenue and can hence be converted into deposits and thereby into loan capital.' (Marx, 1981: 636)

It can be seen that today this has extended well beyond the 'higher forms of salary' to encompass all monetary holdings of all classes, and not just money in the realm of the capitalist. Thus, for example, savings and wages are mediated by the credit system, transforming money into loanable money capital and hence into a 'source of enrichment' for banks (Marx, 1981: 640).

Banks not only borrow money from non-productive sources; they lend outside production too. Again money facilitates this as the universal equivalent, but here it is helped by the form of interest payments and by bank's particular types of credit skills. Money as the universal equivalent has the ability to create a standard of prices for imaginary objects even when they have no value (Marx, 1976: 197). Similarly the liabilities of banks subsume not only interest from loans to productive capitalists but also revenue streams from other activities. As outlined above, they mingle returns to money dealing capital and to loanable capital (Itoh and Lapavitsas, 1999: 70); moreover the possibility exists of incorporating the revenue from any activity, thereby merging 'the circulation of revenues and the circulation of capital indiscriminately' (Harvey, 2006: 274).

[96] As capitalism develops, the categories established appear at once to be both the preconditions and the results of the process of social reproduction (Marx, 1972: 507).

This is achieved primarily through the form of interest payments (Marx, 1981: 595). As an interest rate establishes itself as a norm in society '[a]ny regular periodic income can be capitalized by reckoning it up, on the basis of the average rate of interest, as the sum that capital lent out at this interest rate would yield' (Marx, 1981: 597). The holder of money does not care where the money comes from or what its last use was, and the depositor with the bank only cares that money, or an equivalent, will be available on demand.[97] In this way banks can profitably lend to all areas of society, whether or not they are productive. As I showed above, banks' particular form of credit analysis concentrates on how they will secure the repayment of money, and whether this stems from a production process or elsewhere is of little concern to them – clearly these skills are equally suited to lending to productive or non-productive ends.

3.4 **Money**

The creation of bank credit money is critical in an explanation of the workings of the commercial bank, as I have shown, but a theory of bank credit money must also rest on a theory of money. As with the theory of bank credit developed above, Marx's theory of money begins with simple commodities exchange.[98] This section does not, and indeed cannot in such a small space, attempt a comprehensive theory of money. Rather it lays out the aspects of the theory of money and bank credit money required for an understanding of the banks of the 21st century, which engage in a variety of activities from loans and deposits to derivatives dealing, all of which have in common the creation and sustenance of claims on the bank.

[97] 'Since money does not reveal what has been transformed into it, everything, commodity or not, is convertible into money. Everything becomes saleable or purchasable' (Marx, 1976: 229).

[98] In Volume 1, Chapter 1 of *Capital*, Marx details the emergence of money from a simple to a more expanded form of value. The early chapters of *Capital* form the most abstract part of the book, from where ascent to the concrete begins. A analogous exposition of the logic of banking is attempted in this thesis from the simple (trade credit) to an expanded form (commercial banking and credit money). From here the expansion continues in later chapters to incorporate investment banking. The logic of the development of banking, however, is not only developed in an analogous manner to but also develops out of the logic of the development of the money form (Marx, 1976: Ch. 1).

3.4.1 The functions of money

For Marx, the process of the development of money is endogenous and follows a logical order (Lapavitsas, 1991, Brunhoff, 1976). Money emerges as a measure of value to form the universal equivalent in exchange (the equal and opposite of commodities in the C-M identity); this monetary exchange permits an expansion of exchange in general which in turn establishes money as the 'medium of circulation'.[99] (Marx, 1976: Ch. 3). The attributes and established presence of money in circulation allow a separation between the sale and purchase of commodities that gives rise to idle money, or hoards, the first function of 'money as money'; and to their antithesis, the need for credit (ibid.).The separation of sale and purchase gives rise to these hoards, but they are given flesh in a developed capitalist system by leads and lags inherent in the circuits of production and circulation. Finally, the extension of credit gives rise to a new role for money, the settlement of debt; and here the bounds of simple circulation over money are loosened. Money is sought for itself, first as a means of payment of debts, and in so doing emerges 'as money', not merely as a means of exchange (ibid).[100] These stages and their implications are now examined in more detail.

The logical development of money stems from the exchange of commodities, and eventually one commodity, often gold or silver, emerges to face all others as the universal equivalent. In truly becoming the universal equivalent, a commodity acting as the common currency becomes the numerator rather than the denominator when expressing the relation between commodities. For example, money is the numerator when there are 14 pounds of silver per shirt, and not a certain number of shirts per pound of silver. In becoming the numerator, money comes not to have a price. Now other commodities can fluctuate in price, but as that price must be expressed in money, e.g. gold, then money itself cannot have a price – it is no use to say that one gold bar costs one gold bar. Money is a store of value in general and its value can fall (inflation) or rise (deflation) against all other commodities in general; in contrast, the prices of all other commodities, expressed in money terms, can fluctuate relative to each other. As I show below,

[99] 'The first function of money is the condition for the second, but the second is the necessary complement of the first' (Brunhoff, 1976: 31).
[100] Money as 'world money' (Marx, 1976) is not considered in this chapter.

anything that is given a monetary price is unlikely to be money. Most clearly for this thesis, this means derivatives.

As a measure of value, money helps spread the exchange of commodities for money and becomes a medium of circulation. Even chipped and debased coins can perform this role; indeed '[m]inted into coins and transformed into currency, gold can, in circulating, demonetise itself; it loses its weight of metal and becomes the shadow of its own metallic substance' (Brunhoff, 1976: 32). Money here is already a fetish, a social construct with its roots in the practices of commodity exchange, which, through growing social acceptance, takes on an objective role in society. Money stamps commodities with exchange value, and in doing so increases their exchangeability. Yet it is critical to specify the conditions in which these fetishes arise and the role they play. Legal contracts, weekly markets, indeed trade credit are fetishes to increase exchangeability, but they are not money; and while derivatives have many fetishist elements and are involved in buying and selling, as explored throughout this thesis, they are not money either.

The use of money in the exchange of commodities gives rise to hoards (albeit possibly momentarily) by separating sale from subsequent purchase (Marx, 1976: Ch. 3). With the introduction of money:

> Circulation bursts through all temporal, spatial and personal barriers imposed by the direct exchange of products, and it does this by splitting up the direct identity present in this case between the exchange of one's own product [for] someone else's into the two [acts] of sale and purchase. (Marx, 1976: 209)

For a given capitalist, sale and subsequent purchase do not occur in the same moment. The corollary is that 'as soon as the series of metamorphoses is interrupted, money is immobilized' (Marx, 1976: 227).

Less abstractly, the differing rhythms found in production and circulation are an important reason for these delays between sale and purchase:

> [W]ith the development of circulation, conditions arise under which the alienation of the commodity becomes separated by an interval of time from the realisation of its true price. ... One sort of commodity production requires a longer, another a shorter time for its production. The production of different commodities depends on different seasons of the year. One commodity may be born in the market place, another must travel to a distant market. One commodity owner may therefore step forth as a seller before the other is ready to buy. (Marx, 1976: 232)

The natural temporal mismatches in the circuits of production oblige capitalists to borrow at some points in time and to hoard at others; moreover, borrowing implies a compensating hoard and vice versa. In this way hoards and debts arise and fluctuate in the circuit of production.

Trade credit illustrates how money becomes a means of payment, the next function to emerge. In simple circulation, money as a store of value and a means of circulation was trapped in the C-M-C relation, merely facilitating an exchange of commodity for commodity. With trade credit, the *promise* of money is enough to price and value the commodity and to cause it to change hands. By subsequently settling the debt and completing the transaction, money acquires a new function by acting as a means of payment.[101]

Money's own properties allowed it to split the C-M-C relation asunder, C-M and M-C becoming separable. Now money obtains a further degree of independence: obtaining money for itself becomes the objective of transactions (e.g. for settling debts) rather than simply swapping one commodity for another. Money has emerged 'as money'; it can be found in and out of production and in this way comes to be collected by commercial banks across the economy, as discussed above (Hilferding, 1981: Ch. 3, Marx, 1976: Ch. 3).

[101] 'Not until payment falls due does the means of payment actually step into circulation, i.e. leave the hand of the buyer for that of the seller. The circulating medium was transformed into a hoard because the process stopped short after the first phase, because the converted shape of the commodity was withdrawn from circulation' (Marx, 1976: 234).

3.4.2 Making bank credit money

Although historically observable, the widespread acceptance of bank credit money as money has so far been stated more than theorised and it is necessary to explore how banks' actions facilitate this acceptance. Throughout this thesis banks are analysed as establishing and sustaining claims, these claims facilitate new activities and banks earn a share of the profits of these new activities. To understand the development of banking activities it is essential to draw careful parallels between the differences and similarities in the different categories of claims and how they emerge and are sustained. In analysing bank credit money it becomes possible, among other things, to see how and why not all credit is money and not all money is credit; that not all fetish devices for increasing exchangeability are money; and that not all claims on a bank are money.

As discussed above, one merchant's liabilities become more generally acceptable than those of others, and this merchant becomes the bank and his liabilities become credit money. In order to serve as a means of circulation, these liabilities must be established in society's eyes as a measure of value in general and not one whose particular value can fluctuate. For this, the bank must breed confidence that the claim to money will always be honoured. The first steps that the bank takes is to promise to pay the bearer at short notice, usually on demand, and to repay at par. However, in doing so a contradiction arises for the bank: in making its liabilities fall due before its assets in order to meet the liquidity requirements of liability holders, it actually increases the risks to its business, to liability holders and to its own reputation.

Banks therefore take several steps to increase their creditworthiness in such a way that others will have confidence that they will be paid par on demand by banks; in other words banks increase their *reputation* for creditworthiness. This greatly increases the number of depositors and borrowers in a many-to-one relation on both sides of the balance sheet – a fourth attribute of the banks which reinforces the three specialist attributes explored in previous sections, namely credit skills, cash to hand and technical money dealing skills.

First, banks actively seek a wide range of depositors (Chick et al., 1992) such that 'if one person withdraws it, someone else puts it in' (Marx, 1981: 627). Second, they build up a wide range of assets in a diverse portfolio including cash. The asymmetry of skills between bankers and other capitalists resulting from the specialisation of bankers exacerbates the problem that the banks face. On the asset side of their balance sheet, they have become the economy's specialists in assessing creditworthiness and ensuring repayment. Depositors, specifically non-specialists in this regard, cannot achieve the same level of credit analysis or assess the quality of each of the bank's assets or of its liabilities. Instead, depositors rely on the banks' analysis and must seek other means of reassurance regarding their ability to obtain repayment of their funds. Banks provide this by building up, and convincing others that they hold, a diverse portfolio of assets including reserves of cash.[102]

The diverse portfolio of an intermediary as a solution to the problem of asymmetric information is also analysed by mainstream economists using micro-foundation theories of banking, most famously by Diamond (1984). Here one lender emerges as the delegated monitor of project owners in the face of information asymmetry. To solve the problem of monitoring the monitor, the delegated monitor develops a diverse portfolio. The theory captures one element of the appearance of banks, but to do so it assumes starting conditions without exploring those assumptions. In the method adopted in this thesis such conditions should be developed from within the theory. As a result, and by focusing only on one aspect of banks' appearance, the theory has limited capacity to explain other activities of banks.

The construction of this diverse portfolio of assets, i.e. loans made to capitalists to engage in production, serves to subsume the activities of many production cycles under banks' single liability, making that liability a measure of value in general. The regular reflux of bankers' loans ordinarily ensures repayment of the deposit: value flows to the depositor from the production processes to which the bank lends, via interest and the repayment of the principal amount. Figure 3.10

[102] Even though this very breadth of holdings further reduces outsiders' ability to analyse the bank's creditworthiness based on its specific assets.

below shows how the loan of banknotes to various production cycles, combined with the fungible nature of the banknote – i.e. it can pass from one capitalist to another as a means of payment – leads to credit money in general facing a portfolio of particular production processes across banks' balance sheets, as commodity money faces other commodities.

Figure 3.10: Commercial banks build a diverse portfolio

- Bank A expands lending across the economy, e.g. to capitalist Q, …, U.
- The bank's corresponding promises to pay the bearer on demand become fungible.
- A diverse portfolio of loans makes banknotes the 'general' facing the collection of the 'particular' on the asset side of the balance sheet – a parallel of the mass of particular commodities which face money as the universal equivalent.
- Bank liabilities come to serve as a store of value and a means of exchange.

Bank A

Assets		Liabilities	
Money	10	10	Equity
$Loan^{Q}$	10	10	$BN^{\cancel{Q}}$
$Loan^{R}$	10	10	$BN^{\cancel{P}}$
$Loan^{S}$	10	10	$BN^{\cancel{S}}$
$Loan^{T}$	10	10	$BN^{\cancel{T}}$
$Loan^{U}$	10	10	$BN^{\cancel{U}}$
…		…	

Banks' activities in the money markets, where they also borrow from and lend to other banks, further increase the diversity of their asset pool (Lapavitsas, 2003: 83). In Figure 3.11, banks facing different sets of capitalists, e.g. in the town and in the country, lend to one another and thereby increase the diversity of their portfolios.[103] This diversity means that depositors are insulated from the success or failure of particular production processes, but are exposed to the economy

[103] Marx/Engels quote the *Economist* of 1847 on the early money market in London. Noting that some areas of the country would be in surplus while others were in deficit, they explain how billbrokers – in effect bankers – deal with banks in different areas of the country to take in and lend out the surplus; '… and in this way Lombard Street has become the great centre in which the transfer of spare capital has been made from one part of the country, where it could not be profitably employed, to another, where a demand existed for it' (Marx, 1981).

more generally through bank lending, particularly as bank lending and bank credit money become fully established.[104]

Figure 3.11: Interbank lending leads to increased portfolio diversity

Banks lend to each other further diversifying their portfolios

Town Bank

Assets		Liabilities	
Money	10	10	Equity
$Loan^{TownieA}$	10	100	BN
$Loan^{TownieB}$	10		
$Loan^{TownieC}$	10		
$Loan^{TownieD}$	10		
$Loan^{TownieE}$	10		
$Loan^{Country\ Bank}$	50		

Country Bank

Assets		Liabilities	
Money	10	10	Equity
$Loan^{FarmerA}$	10	100	BN
$Loan^{FarmerB}$	10		
$Loan^{FarmerC}$	10		
$Loan^{FarmerD}$	10		
$Loan^{FarmerE}$	10		
$Loan^{Town\ Bank}$	50		

Banks borrow and lend in the money market and in doing so further diversify their balance sheets.

In light of the above analysis, a parallel can be drawn between the spontaneous emergence of commodity money and that of credit money. Value is crystallised in commodities through the processes of production and exchange. Commodity money then emerges spontaneously as one commodity facing all other commodities in general is established as the socially-acceptable universal equivalent. As commodity exchange becomes fully established, commodity money becomes a measure of value in general; its value is not exposed to the price movements of one commodity in particular (Marx, 1976: 193). Similarly, value generated in production flows to credit money via the bank through repayment and interest payments. Credit money emerges spontaneously, facing all other credit in general across banks' balance sheets, through diverse portfolios of bank lending (including interbank lending). As credit becomes established,

[104] Assuming unregulated banks in efficient markets (Black, 1975) and/or a competitive banking industry (Fama, 1980) leaves no role for bank portfolio management or credit analysis. Banks are obliged to price loans and construct portfolios in accordance with the market, e.g. using option prices or option pricing techniques (Black and Scholes, 1973). As with many goldsmiths theories, bank credit money does not feature for Black and for Fama, bank liabilities are explicitly securities, this is made possible because liquidity is assumed to be limitless.

bank credit money becomes a measure of value in general; its value is not exposed to one production process in particular.

Credit money becomes money through its social acceptability and the banker's specialism among merchants and the strength and diversity of its lending; however, '[t]he adequacy of such credit money for the function of "money as money" cannot be taken for granted, and has to be established continually and in practice' (Lapavitsas, 2000a: 637). Indeed, '… the adequacy with which credit money as a whole functions "as money" depends on the institutional structure of the credit system, and the policies adopted by monetary authorities' (ibid: 638).

A key element of this infrastructure is the clearing arrangements that banks put in place, the spread of which allows the gross quantity of credit money to grow in relation to the means of payment (Marx, 1976: 235) and generally strengthens and broadens the acceptance of credit money. Clearing helps the establishment of bank credit money, in part because it allows a private bilateral promise to pay by one bank to become a promise to pay that will be redeemed by several banks; in doing so, that particular promise becomes more generally acceptable. Clearing contributes to the transformation of the particular into the general. Bank A's notes are acceptable by Bank B because they can be submitted to clearing, and vice versa. This effectively reduces competition between Banks A and B and, importantly, sets their notes apart from the notes of banks not accepted in clearing. Banks must invest in building and maintaining payment systems and clearing houses, and must cooperate in order to do so. As I show in later chapters, a strong parallel exists with derivatives, where derivatives claims on various banks are given an increased appearance of exchangeability by being submitted to a central clearing house.

3.5 **Conclusion**

This chapter has developed a theoretical understanding of banks that stems from exchange in a capitalist society and allows for a continued and consistent expansion of the theory of banks to include their early 21st-century activities, most notably derivatives dealing. Banks emerge from discounters, which are specialist merchants that take on certain skills which they continue to adapt as

bankers, the possession of which separates them from other capitalists. Banks become established as a separate capital to which the creation and sustenance of claims to monetary value is essential. Claims to money act as money, allowing commercial banks not only to economise on the use of money in exchange but also to collect idle monies that would not otherwise be used and channel them to profitable uses. To understand this fully it is necessary to move beyond the concept of IBC, which I have analysed as providing a return to property only. Analysis must move on from IBC to introduce the more concrete and complex category of loanable money capital, involving a return to bank capital as both property and process.

The distinction between capital as property earning interest and capital as property and process earning a share of surplus value in general becomes even more central to an understanding of banks with the advent of joint stock companies and markets for debt and equity securities. Banks expand their activities using and developing their specialist attributes, and through the issuance and sustenance of claims they profit from making securities markets. Yet in these markets the nature of the claims that they establish is different from those that become credit money; indeed in securities markets the claim is not a claim to money that comes to act as money, but a claim to a particular stream of income that is exchangeable for money. It is once again important to specify the ways in which the claims arise and function, and their impact on the economy; the next chapter addresses this.

4 Securities dealing as a banking activity

4.1 Introduction

Securities' dealing is undertaken overwhelmingly by investment banks and is a banking activity (Duffie, 2010). A single theory of banks should be capable of explaining how banks have become both commercial banks and securities dealers (and, for that matter, derivatives dealers). This chapter and the next develop a theory of investment banks that presents investment banks as securities and derivatives market makers. It views investment banking as an integral banking activity and as an expansion of the specialisation developed by discounters and commercial bankers discussed in Chapter 3. It presents a view of financial markets which is quite different from that often found in financial theory: it views financial markets not as emerging on their own or in opposition to banks, but rather as a result of bank activity. In fact I argue that banks literally make financial markets for themselves and for money capitalists: not only do they 'stand ready to buy and sell' (Levi, 2005: 563), they also they provide the market infrastructure for this.

More than in the previous chapter, the foundation for the analysis of securities markets laid by Marx and Hilferding must be approached with care. The method outlined in Chapter 2 must be applied to ensure that their work is updated and refined to reflect the reality of international banking in the early 21st century, and in particular with the aim of understanding banks' role in derivative markets. With this aim in mind, this chapter expands the analysis of commercial banking set out in the previous chapter such that securities' dealing is incorporated into a theory of bank capital. It is argued that bank capital proceeds by creating and sustaining claims to monetary value, on itself and others, which facilitate activities otherwise not possible, and that bank capital earns a share of the profits from such activities. Securities, as one form or manifestation of this essence are shown to be claims on the income of a production process that are sustained by banks undertaking to make a market in them. This market enables lenders to return to the benefits of money when required. In this way, banks as securities market makers use the creation and sustenance of claims in the form of securities

to facilitate the collection and lending of monies that would otherwise remain idle.

The analysis draws a parallel with commercial banking, showing first the essential similarity as creators of claims but also the key differences in form; and second how this change in form has implications, particularly for dealing activities, which it encourages, and for the sorts of idle money that come to be collected. Crucially, liquidity in securities markets comes not from claims acting as money (as bank credit money was shown to do in Chapter 3) but by making claims exchangeable for money, or tradable. The trading behaviour that this begets influences the character of securities markets and opens the way for derivatives dealing.

Contrary to neoclassical theory, and as stressed throughout this thesis, markets cannot simply be assumed to spring from nowhere; they must be given material roots (Lapavitsas, 2003: 9). In this analysis the opportunity for banks to profit from the creation and sustenance of claims provides these roots. Banks, the keystone of securities markets, really are 'market makers': 'intermediar[ies] who creates a market for a financial obligation' (Law, 2008: 278). In this thesis this making of markets has two elements: the first and usual sense is that they publish prices at which they 'stand ready to buy and sell assets' (Levi, 2005: 563), providing liquidity to the markets.[105] Second, they are market makers when they provide the market infrastructure – a role interlinked with the first. For example, they are central to the standardisation of legal terms;[106] they organise and run clearing houses;[107] and they provide technology and research to market participants.[108] By making markets in this way, banks sustain the joint stock organisation of capitalism, where the analysis begins. Throughout this thesis

[105] Although not a critical assumption the main market structure assumed throughout this chapter is what market microstructure theory refers to as a 'competitive multiple dealer market', this is the dominant market form not only in most debt security and FX markets but more importantly for this dissertation in OTC derivative markets. (Gravelle, 2002: 1)

[106] E.g. the European Financial Markets Lawyers Group, (European Financial Markets Lawyers Group)

[107] E.g. of 20 members of the board of the London Clearing House (LCH), 2 full-time members are previously long term employees of JPMorgan and the Bank of England, 15 are employed by international Banks, 2 are from other exchanges and only 1 is not a banker.

[108] E.g. see UBS Investment Bank's website outlining services provided to hedge funds. (UBS Investment Bank, 2012)

banks making markets in this dual role are referred to as market makers or, more often, dealers.[109]

Section 4.2 analyses joint stock capitalism; section 4.3 draws a parallel between commercial banking and securities dealing; section 4.4 looks at the specialisms and profits of banks as securities dealers, again in comparison with commercial banks. Finally section 4.5 examines lending and borrowing from outside production in securities markets, before 4.6 concludes.

4.2 **Joint Stock**

4.2.1 Joint stock capitalism

Joint-stock financing represents a qualitative change from the pooling of individual capitalists, and the emergence of general incorporation marks a distinctive change in capitalism. National institutions have been important in shaping the specific forms and timing of the emergence of joint-stock capitalism and related banking practice at different times and in different places. Nevertheless, important commonalities can be extracted for the general theory of banks being constructed here.

Before the full establishment of industrial capitalism, securities issuance was dominated by states, especially for purposes of war, with lenders advancing money in return for a share of the spoils. Corporations also pre-date industrial capitalism, perhaps most famously in the UK with the East India and South Sea Companies, and securities were already a rich environment for bubbles, speculation, swindles and crashes.[110] As industrial capitalism became established,

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[109] Benston and Smith (1976) state: 'The most basic form of financial intermediary is the market maker. He simply provides a market-place where potential buyers and sellers come together …. An example of this form of intermediary is the New York Stock Exchange. It does not create assets, it only furnishes a physical location for buyers and sellers to transact. … A somewhat more sophisticated form of financial intermediation is provided by a dealer who also takes a position at his own risk in the asset transacted.' By this definition banks act as dealers in securities and derivatives markets. 'Market maker' however captures more of the sense of banks as instrumental to the existence of the market.

[110] Chancellor (1999: 48) notes that 'In the stock market of the 1690s, the line between commendable self-interest and arrant fraud was frequently crossed'; indeed he notes that 'at this date, 'to bubble' meant to perpetrate a fraud'. Crashes were also spectacular: 'of 140 English and Scottish companies operating in 1693, only 40 survived the crisis of 1697 – a failure rate of 70%' (ibid: 52). A generation later the South Sea Company was at the centre of another bubble

first canals and then railways became favourites for incorporation. In 1824 the Bubble Act was repealed and generalized incorporation was largely ushered in with the Joint Stock Companies Act 1856 (Kindleberger, 1984, Hobsbawm, 1975: 252). In the meantime the Country Bankers Act of 1826 allowed joint stock banks outside the City of London, resulting in their spread in the 1830s (Kindleberger 1984).

Outside Britain, the detailed story of incorporation and related bank practices has its own specificities. As Gerschenkron (1962: 7) notes, although other European nations, such as Germany broadly followed England's path to industrialisation there were also 'considerable differences' and 'to a considerable extent' these stemmed from specific national institutional arrangements. Early institutional economists, such as Veblen, 'stressed the cumulative and path dependent nature of institutional change', where institutions can be broadly defined, including for instance the law and 'generally accepted ways of thinking and behaving' (Rutherford, 2001). This idea of path dependency is consistent with a Marxist approach which stresses agency within an inherited structure which re-shapes the future structure; and which investigates the interaction of economic forces, law, politics and ideology. The specificity of developments in different places at different times is reflected in the debate over the benefits of bank-based vs. market-based financial systems (Demirguc-Kunt and Levine, 1999). While the UK might be thought to be more market-based, Germany is typically seen as more bank-based. These differences were influenced by different national institutional arrangements and national banking structures. For example, larger German banks would have had a greater capacity to hold larger-scale loans while retaining depositors' trust in the diversity of their portfolio (see Chapter 3), while in comparison the relatively fragmented UK banks would have had less capacity to hold large-scale loans and were therefore more likely to turn to securities markets.

Despite these differences as industrial capitalism established itself in different places and at different times, financial systems became a mixture of bank lending

resulting in the Bubble Act of 1720, 'which made illegal the establishment of companies without parliamentary permission and prevented existing companies from carrying on activities not specified by their charters' (ibid, 1999: 82).

and securities markets. The empirical difficulties in distinguishing between bank-based and market-based systems underline this: empirical studies invariably display a complex mix of the two and have difficulty constructing a single measure of financial structure for use in regressions (Levine, 2002).

For the purpose of developing the theory of banking practice, the similarities are more important than national differences: securities issuance and joint stock capitalism emerged in all advanced capitalist economies. The securities markets of today are the most developed form available for study, and both the issuance and the market making for securities are dominated by investment banks (Duffie, 2010).[111] The very large banks that dominate these markets appear to have more in common as global banks, particularly in financial markets, than they do as nationally-specific banks.

As an additional point, the theory developed here suggests that the labels 'bank-based' and 'market-based' financial systems would be more appropriately called 'commercial bank-based' and 'investment bank-based' financial systems: companies must visit their commercial bank for loans and their investment bank to issue securities. Such an approach also argues against an outright process of bank disintermediation as a result of more financial markets (as expounded by mainstream accounts of banking (Campbell et al., 1988: 201, Edwards, 1996)) but rather argues for a shift in the form of banking. As discussed in Chapter 2, a market is an abstract category that means little without further elaboration of how it is 'made', therefore to discuss market-based systems without analysing their roots and mechanisms is to risk misunderstanding them.[112]

The general emergence of securities represents a change in the form of property: they give the wealthy a means of transforming the form of their property away from land or a particular business such as the family firm (Kindleberger, 1984: Ch. 10).[113] In prior forms of capitalism, wealth ownership and control of

[111] Chapter 1 highlighted how derivatives markets are dominated by the 15-20 largest banks acting as dealers.

[112] Methodologically it might be thought that the bank vs. market view also has a tendency to begin analysis with earlier forms of securities market, rather than with the latest form of highly tradable capital markets dominated by dealers and other non-dealer financial investors.

[113] Government bonds played a crucial role in this process of change of form of property by offering a risk-free benchmark, the least risky route for alternative investments (Kindleberger,

productive resources were fused together, such as the owner/manager of a factory or the lord of the manor under feudalism. The general emergence of joint stock capitalism means, to put it simply, that 'many … corporations are not run by the people that own them' (Morck et al., 1986: 1). In other words there is a 'separation of ownership and control' (Fama and Jensen, 1983).

Joint stock companies are not the same as the pooling of owner/manager capitalists in a partnership; they represent a qualitative shift of form in both the scale and the flexibility of ownership.[114] The separation of control and ownership allows owners the flexibility to exchange ownership and to change the form of wealth without affecting or being tied to underlying processes (Bryan and Rafferty, 2006: Ch. 4). Above all, the ability to change the form of wealth from securities to money allows banks to collect additional funds through securities markets, as explored in the rest of this chapter. In this way joint stock permits a 'tremendous expansion in the scale of production' (Marx, 1981: 567).[115]

4.2.2 Capital as property and process

The establishment of the credit system, and in particular the coming of joint stock companies, exposes a dual aspect of capital – the qualitative division between property and process. In this thesis, joint stock companies represent a moment when the 'quantitative division of profit into net profit and interest turn[s] into a qualitative division' (Marx, 1981: 495), where 'interest is the fruit of capital in itself, of property in capital, without reference to the production process, while profit of enterprise is the fruit of capital actually in process, operating in the production process' (ibid: 497). Importantly, this division is one of capital and does not involve the relationship with labour.

1984: Ch. 10). The railway and canal companies can be seen as an intermediate stage before the fuller establishment of general incorporation.

[114] Even using the term owner/manager anticipates the split in roles, of course, and can only be used in light of the changes that subsequently occurred

[115] Kindleberger (1984: 202) notes the historical significance of the emergence of joint stock capitalism when he says: 'Whatever the proximate cause … the basic reason was surely that the amounts of capital required by railroads, mines, shipping companies, banks and an increasing number of industrial enterprises were increasing beyond the capacity of informal markets to provide them'. Stock markets here might be usefully seen as both a precondition and a result of the expansion of production.

One way to analyse this split is via the relations of production. Capital both benefits economically from the production process and has possession of the means and objects of production (Poulantzas and Camiller, 1978, Poulantzas and Fernbach, 1975). The split between capital as property and capital as process might be thought to separate these two aspects of the relations of production. Capital as property owns the economic benefits, while capital as process has possession of the means and objects of production.[116]

The distinction between capital as property and capital as process can be used in analysing securities markets. In this analysis, securities, including both debt and equity, are taken to be capital as property. To see how this abstraction comes about it is possible to trace several steps from an owner-manager issuing debt to a company issuing highly-traded debt and equity.

In an owner-managed capitalist enterprise that issues debt, debt certificates can be thought to earn interest as capital as property. The equity held by the owner-manager, however, is not distinctly split between capital as process and capital as property. With knowledge of the more developed form, i.e. joint stock capitalism and increasingly actively-traded equity security markets, it is possible to see that analytically the owner-manager's capital can be split abstractly between property and process, even though, concretely, it is jointly embodied in the owner-manager.

In the next logical step, the roles of owner and manager are split as equity securities are issued. There might appear to be some ambiguity about the place of issued equity when considering control of the production process. Equity holders are largely removed from the production process; they advance money and expect a return, and in this respect equity securities look like capital as property. At the same time equity holders theoretically retain some aspects of control, perhaps

[116] 'In capitalism, the direct producers are entirely dispossessed of the object and means of their labour: they are separated from them not only in the economic property relation but also in the relationship of possession.' By way of contrast '… in the pre-feudal modes of production, the direct producers were separated from the labour-object and the means of production through the economic property relation, they were not separated from them in the second constituent of the relations of production, namely, the relationship of possession' (Poulantzas and Camiller, 1978: 18). In this framing it can be seen that the split between property and process could not have occurred in the same manner in another mode of production, e.g. where direct producers owned the means of production. At the same time securities are merely a form of ownership of the economic benefit of production, and as such, securities can and do exist outside capitalism.

diminished compared to an owner-manager but in theory distinguishing them from debt-holders.

Neoclassical economics has developed a large body of theoretical literature investigating this separation of management and control and the problems it can bring as managers pursue their own interests and not those of owners (e.g. Jensen and Meckling, 1976). In theory their interests are aligned because, for example, owners can usually vote at annual general meetings and approve board membership and remuneration; it is also argued that the threat of takeover and the sacking of managers allows equity holders to influence control of management (Stiglitz, 1985). Yet this does not appear to be the case in practice, and micro-foundation theorists seek to explain this through market failure, most often based on information symmetries (Stiglitz, 1985). As usual this micro-foundation approach seeks to explain discrepancies between observation and perfect market theory with instances of market failure and advocates action in this light, e.g. paying management with equity (Morck et al., 1986).

The exchangeability of securities distinguishes them from partnerships, and observations of the latest trading practices in securities markets allows equities to be categorised in this analysis as capital as property on a similar footing as debt securities.[117] Equity holders in the latest period, e.g. in 2013, especially with the rise of institutional investors analysed in the next chapter, can be characterised as trading more and as having ever-shorter holding periods. This reduces both the motivation and the scope for intervention in the processes of production (Edwards, 1996: 54-59). Computerised high-frequency trading (HFT), in which dealers potentially undertake thousands of trades per second and holding periods are measured in fractions of seconds, shows how little possibility there is for equity to act as capital as process.[118] Furthermore, to banks as securities market makers there is no qualitative difference between debt and equity securities as objects of their securities-dealing business, as becomes clear in the next section's

[117] It might be noted here that capital as property and process have both shared and divergent interests: they fight for a relative share of surplus value but have a common interest in increasing the absolute amount of it.

[118] Control of the early charter and joint stock companies rested more in the hands of politicians and management, e.g. in determining the scope of the charter, than in the hands of equity holders (Neal, 1990).

analysis of the role of banks as securities dealers and makers of the securities markets.[119]

For this analysis, therefore, debt and equity are treated as having more in common than differences as claims on the income of the corporation[120] As Marx states:

> The ownership titles to join-stock companies … are genuinely titles to real capital. Yet they offer no control over this capital. The capital cannot be withdrawn. They give only a legal claim to a share of the surplus value that this capital is to produce. (Marx, 1981: 608)

The income generated by industrial capital, which is taken to be capital in process, is paid over to securities as interest on capital as property.

Accepting their essential similarity for the purposes of this analysis shows that this payout to capital as property has a structure. In different circumstances different types of claims are likely to take precedence: in times of high profit the claim of a bond holder might earn less than that of an equity holder; in less profitable times the reverse may be true, particularly in default. This simply means that the claims are structured or contingent, and indeed there are hybrids of debt and equity such as convertible bonds, and amongst the classes of debt and equity there are often further distinctions, e.g. senior and subordinated debt. [121]

Finally, the distinction between property and process helps the analysis of banking capital (containing both property and process) and of the form of capital

[119] The definition of securities debated here cannot be formed independently of the broader analysis of the making of securities markets.

[120] Much of economics views the split between debt and equity as critical. Much neoclassical scholarship emphasises the importance of the difference between two for calculating the value of the firm, from Modigliani and Miller (1958) to agency theory discussed above, e.g. Jensen and Meckling (1976). Meanwhile, Black and Scholes's (1973) theory, used by money capitalists to profit from trading financial claims ,views securities as differently-structured claims on the assets of the firm while equity as the residual claim retains a qualitative difference to debt. Amongst post-Keynsians, opinion might be said to be split: while Toporowski (2000: Ch. 1) sees little difference for the purposes of explaining financial inflation, he points out that the difference is important to Minsky's financial instability hypothesis (Minsky, 1975: Ch. 5).

[121] Hilferding points out that corporates can obtain bank loans more easily than partnerships, as they have the option of issuing equity to raise money to pay back loans (Hilferding, 1981: 120). Equally firms can raise debt to increase leverage, effectively benefiting shareholders.

in which it deals (claims to interest – capital as property).[122] As a particular capital, banks must offer a specialised process to capital in general in order to allow returns to bank capital as property. Bank capital does not simply lend money and earn interest as a share of surplus value, i.e. IBC (Marx, 1981); it is a capital that contains elements of both property and process, and this process involves dealing in capital as property. The complexity is increased as banks generally deal in other people's and their own capital as property – put simply, banks lend their own and other people's money. Banks as dealers in capital as property take various forms, but categories of commercial and investment bank prove useful for analysis as they reveal both similarities and critical differences, which the next section takes up as it explores how investment banks come to facilitate and profit from the collection and lending of (other people's) otherwise idle money via securities markets.[123]

4.3 Securities dealing as a banking activity

Securities markets might appear to be a disintermediation of bank activity; (IMF, 1998), but banks are at the heart of these markets and understanding securities markets is inseparable from understanding banks' role as securities dealers (Duffie, 2010). This section therefore analyses the emergence of securities market-making activities by drawing parallels between commercial and investment banking. The essential similarities between the two banking activities in creating and sustaining claims to allow the collection and on-lending of otherwise idle money are drawn, before examining the differences in the forms of the liquidity provided. A theory of banks must be capable of incorporating securities dealing and the trading behaviours inherent in securities dealing, identified only abstractly in this chapter, which are critical to the emergence of derivative markets discussed in the next chapter.

[122] As noted above, joint stock banking in the UK dates to the 1830s (Kindleberger, 1984).

[123] Banks are also generally joint stock companies and thus subject to their own concrete division of property and process. Amongst other things this, allows them to lend to other banks via securities markets and the money market.. The joint stock nature of banks allows them, as other capitals, a scale that would otherwise not be possible. This aside, however, incorporating the joint stock nature of banking into this analysis brings added complexity without much further insight into the nature of banks' securities and derivatives activities.

4.3.1 The similarities between securities dealing and commercial banking

Investment banks typically provide capital to corporations by managing the issuance of securities on its behalf:

> To provide the capital [to the corporation], the bank need only advance it, divide the sum into parts, and then sell these parts in order to recover its capital. Thus performing a purely monetary transaction (M-M1). (Hilferding, 1981: 120)

Buyers of securities, who are lenders, hold assets which are a claim directly on the income of the borrowing firm.[124]

However, simply selling debt to long-term holders of loans is qualitatively different from banking: banks do more than this, as they allow money capitalists (lenders) to retain access to money. Commercial banks achieve this by issuing claims to money which, through banks' actions, come to act as money (see Chapter 3). First, this allows them to minimise the relative amount of money used in exchange, and second, it allows them to collect idle money from 'innumerable small puddles' (Schumpeter, 1954: 319) and, concentrating it, to lend it and earn a share of the additional surplus value or revenues thus generated by the borrower. This doubling achieved by credit money allows access to the benefits of money for both borrowers and lenders.

Investment banks achieve a parallel doubling via securities markets:

> [Banks] also perform a third function in supplying productive capital, not by lending it, but by converting money capital into industrial capital and fictitious capital and taking charge of this process themselves. (Hilferding, 1981: 127)

'Fictitious capital' is a claim to income from industrial capital which, thanks to the marvels of discounting, can be expressed as a lump sum of money today. This doubling of money capital into industrial capital, and claims to income from it, allows the money lent to be used by the borrower (as capital in process), while

[124] This is in contrast to a commercial bank ,which subsumes the advance of capital under its own liabilities. Depositors could be said to own the assets indirectly via the banks liability.

at the same time lenders (money capitalists or owners of capital as property) retain access to money via securities markets. Banks facilitate this access to money by making markets in securities: the investment bank undertakes to buy back the security on demand, thus re-transferring it into cash for the lender.

An example helps to illustrate how dealing in securities works. Company A wishes to borrow money to buy machinery, which will repay the cost of borrowing over a number of years. Companies B, C, and D produce Christmas cards, Easter eggs and deckchairs, receiving cash at Christmas, Easter and in August respectively and not spending it until later in the year. The demands of the production process mean that companies B, C and D have idle money at certain times of the year, but cannot lend in the long term if they are to restart their production processes in time for the next year's sales. On the other hand, they cannot leave their annual proceeds sitting idle. The bank, as security dealer, organises the issue of a security, a claim to the income of company A (as generated by the new machine). Company B buys the security on January 1st with its annual revenue, but after some months requires money to buy card and ink. The bank makes a market in the security of Company A, quoting both a buy and a sell price with the intention of profiting from the difference. Thanks to the bank making a market Company B sells the security back to the bank in exchange for money. Meanwhile, with the proceeds of its Easter bonanza, company C is similarly looking to temporarily invest its capital; it advances money to the bank, holds the security and receives an interest payment from the security before C sells the security back to the bank when the time comes to pay for its annual shipment of cocoa.[125] Finally, company D temporarily exchanges money with the bank in return for a claim to the income of company A and, thanks to the bank acting as market-maker, is able to return to money long before Company A has the money to repay the loan.

This ability to return to money is much more than a convenience: 'For the shareholder to become a money capitalist … he must be able to regain possession of his money capital at all times' (Hilferding, 1981: 109), and '[i]t is the

[125] Note that the interest payment from the security may take the form of a dividend for equity secutities.

transferability and negotiability of these certificates, constituting the very essence of the joint stock company, which makes it possible for the bank to 'promote' … the corporation' (ibid: 120).

So that the bank does not find itself holding the entire loan, which might pose several problems for the bank, for example making it undiversified (see Chapter 3), it must cultivate many possible buyers (and sellers) of securities, i.e. a secondary market. While this market may appear to take on a life of its own, the bank must stand behind it: it must 'make' the market if it is to ensure that the lenders have the ability to exchange their securities holdings for money. Banks also build market infrastructure such as legal norms, payment and clearing systems.[126] There are clear similarities here with commercial banks' activities seeking to cultivate a wide range of depositors and to build payment and clearing systems.

This view of securities markets is in direct opposition to most other economics theories of securities markets. In neoclassical theory, securities (and derivatives, less costly than 'primitive securities') help to achieve efficiency through market completion (Ross, 1976). Markets appear to emerge inevitably in the light of these efficiency gains. The closest many textbooks get to explaining their presence, or the process of their emergence, is to state the theoretical gains.[127] Market infrastructure is then captured as a second-order effect by adding assumptions about transaction costs and market imperfections.

4.3.2 The differences between securities dealing and commercial banking

As well as fundamental, even essential, similarities between securities dealers and commercial banking there are also important differences. Liquidity provision in securities issuance and dealing contains crucial differences to liquidity provision through commercial bank deposits and lending. This difference stems from the nature of the doubling that the bank uses to facilitate the lending of money that

[126] Sociologists examining financial markets often pick up on the ways in which dealers construct markets. E.g. Knorr-Cetina and Preda (2005) and MacKenzie (2007)

[127] E.g. '[t]he importance of capital markets cannot be overstated … funds can be efficiently allocated from individuals with few productive opportunities and great wealth to individuals with many opportunities and insufficient wealth. As a result, all (borrowers and lenders) are better off than they would be without capital markets' (Copeland and Weston, 1988: 13).

would not otherwise be lent. In commercial banking, liquidity is achieved by a doubling of money: bank credit money faces production processes in general through the diversity of the bank's balance sheet, repays at par and is made up of claims to money that come to act as money (Ch. 3). In securities markets the lender's claim is on a particular production process. As a result, securities cannot act as the universal equivalent – money – as they are not equivalent to the universe of commodities or production processes as money was shown to be in Chapter 3. Instead of acting as money securities are made exchangeable for money. Not being money and being exchangeable for money, securities have a money price that moves relative to the prices of other assets and commodities. Bank credit money, representing production in general and serving as the universal equivalent, does not.

Again, an example helps to emphasise the point. Company A holds a liability of bank Z. If bank Z has lent to every production process in the economy, either directly or via lending to other banks in the money market, and has cash to hand, then the creditworthiness of the liability that A holds is not exposed to the ability of any one producer to sell commodities but to the economy as a whole. This diversity increases the chances that the bank's liability repays at par and establishes a stable and reliable 1-1 ratio between the claim on the bank to money and money itself. In terms of the functions of money, the bank's liability can become a measure of value and therefore a means of circulation. This, together with the fact that the whole economy borrows and holds bank liabilities, contributes to making them generally acceptable as money.[128] The bank liability, a claim to money, comes to act as money.

If on the other hand Company A buys a security of Company B, A can still return to money by selling the security back to the market maker, but the claim on company A is exposed to the effects of competition on company B: if B prospers, the price of the security is likely to rise; if it falters, the price is likely to fall. Facing one production process it is not universally equivalent (to all other commodities / production processes) but rather equivalent to one particular

[128] Central banks, fiat money and the state play a critical role in making bank credit money generally acceptable, but this can be left aside in the comparison of commercial and investment bank activities.

capital. The security cannot then be used as money, i.e. to buy commodities, as there is no reason for it to hold a stable 1-1 relationship with money – it is not a reliable measure of value (in general) and therefore fails as a (general) medium of circulation.

Further clarity can be seen in comparison to the approach of Kregel, a leading Post-Keynsian economist, who argues: 'Both [commercial and investment banks] provide liquidity; they just do it in different ways: the former by creating deposits, the latter by structuring the liabilities issued by borrowers' (Kregel, 2010a: 8). Furthermore:

> Investment banks … provide liquidity by ensuring that the liabilities they underwrite [i.e. securities] have a higher liquidity premium than the capital assets they finance and thus can be bought or sold in organised markets … They do this by ensuring an active and liquid secondary market for securities through their … activities as market makers. (Kregel, 2010b: 3)

Howeverr, Kregel appears to downplay the difference between commercial and investment banking when he claims that 'a commercial bank creates liquidity by ensuring that its liabilities have a higher liquidity premium than its assets and thus can always be exchanged for currency'.[129] I have shown how bank credit money goes beyond being simply exchangeable for money and how its liquidity comes from the way in which it comes to act as money.

4.3.3 Trading

Financial market trading is defined in this thesis as buying and selling with the aim of profiting from price moves. This is different from simple buying or selling which is motivated by a desire to hold the asset (e.g. to earn interest) or to liquidate it in order to return to money. The trading element which is inherent in securities markets stems from the nature of the liquidity that the bank provides, and is critical in explaining the role of bank as dealer and later the emergence of

[129] In his arguments about financial regulation in the articles cited, Kregel appears to regard the liquidity produced as interchangeable, perhaps because he downplays the differences of form, whereas the very difference in the form of liquidity analysed above would prevent such interchangeability.

derivatives. The term 'dealer' here is synonymous with 'market maker'. The dealer is engaged in trading, i.e. buying and selling at different prices to make a profit, but differentiates itself from other traders by making the market, providing both liquidity and infrastructure. Dealers/market-makers are paid primarily by charging a higher price for selling than for buying; the difference in price between the highest price that a buyer is willing to pay for an asset and the lowest price for which a seller is willing to sell it is known as the 'bid-ask spread'.

At this point in the analysis, securities markets contain two inherent and combined elements: they provide firms with finance and they trade. By providing a way for capitalists to return to money they allow the collection and concentration of idle monies and their conversion into money capital through lending it to industrial capital. At the aggregate level, for a given amount of borrowing, lenders come and go as depositors did: while some lenders exit the relation by selling their securities, the lending relation is replenished as, on the other side, new lenders enter by buying securities.

Because they are claims on a particular process, and because they are exchanged, securities have a price, and a price that moves. This in turn means that lending in these markets is bound up with trading and with the constant readjustment of the investor's portfolio which stems both from 'the stick of financial risk' and the 'carrot of speculative profit' and, as I will show, with derivatives, is 'laced with the proceeds of extensive arbitrage' (Eatwell and Taylor, 2000: 3).[130]

The palpable but ever-changing price is central to these markets and merits further investigation. This price is nothing more than an expression of the interest earned by capital as property. Interest (and hence the price of the security) has an appearance of solidity: it is continuously quoted and seems to be fixed for all, even if it changes in the next moment to a new fixing (Marx, 1981: Ch. 22-3). This is true for both untraded bank loans and traded securities, but the nature of interest nevertheless helps to establish trading in the latter. If interest is paid on deposits it might be quoted each day but makes little difference to the activity of

[130] 'The fact that speculation is unproductive, that it is a form of gambling and betting … does not run counter to its necessity in a capitalist society … but simply testifies against the way in which this society is organised' (Hilferding, 1981: 138-9).

liability holders, except that they may switch deposits from one bank to another; they will nevertheless (ordinarily) be repaid at par on demand by the borrower (i.e. the bank). Where the advance is to be traded, however, the continuously updated nature of the interest is relevant to the security holder. The interest rate is expressed as a price for the security, and by having a price the security can adopt the form of a commodity without being a commodity (Marx, 1976) .[131] Securities prices must be known to market participants, who must be able to trade at any time to return to cash, and the palpable nature of interest helps in this regard.[132]

As well as being palpable and quoted, however, interest is simply the result of a division of surplus value between capitalists and is not determined by anything more fundamental than the forces of supply and demand.[133] The setting of interest involves no confrontation with labour[134] and therefore lacks a fundamental tendency around which the price can fluctuate.[135] The price varies with the interest rate in general (the forces of supply and demand between property and process); among particular capitals (the perceptions of the varying prospects of particular production processes); and among the various claims to the funds flowing from those processes (affecting the relative prices of a given

[131] Interest moves inversely to price through the simple mechanics of discounting. The price of a single future cash flow, P, of size X, can be expressed as $P=X\ e^{-rt}$ using continuous compounding or $P=X\ /\ (1+r)^t$ using simple compounding, where e is the exponential, r is the interest rate and t the time until the cash flow (Copeland and Weston, 1988: Appendix A).

[132] Indeed the more frequently the prices are displayed, the more frequently participants are encouraged to trade as they attempts to profit from price changes, and vice versa: the more they trade, the more the price appears palpable, if forever changing. Banks are aware of this and encourage more transactions per time period by proving real-time trading tools to clients – for banks, 'moments are the elements of profit' (Marx, 1976: 352), and the more transactions per time period the more profit they can accumulate. This, however, is not to speed up the circuit of capital and hence increase the flow of surplus value but their attempt to capture a share of that surplus value from other capitalists. High-frequency trading provides further evidence of the continued increase in the speed of securities trading with trades occurring in milliseconds and firms locating next to exchanges to reduce the length of carbon fibre cable and hence reaction time of their computers to published prices (Grant, 2010).

[133] The separation of ownership and control, the payouts to each face of capital (property and process) and the resulting incentives for factions of capital has led to a wide literature both classical (e.g. Smith, 1937: 700, quoted in Jensen and Meckling, 1976: 305) and neo-classical (e.g. Alchian and Demsetz, 1972, Shleifer and Vishny, 1986). These works essentially attempt to rationalise this straightforward conflict within an efficiency- and market-based theoretical framework.

[134] Notwithstanding matters of financial expropriation where labour faces the financial system as lender and borrower. For more on financial expropriation see Lapavitsas, 2009b.

[135] Unlike the rate of profit, which does have a central tendency thanks to its determination at the point of conflict between labour and capital, but which is not palpable and observable, as interest is.

corporation's different types of securities).[136] As the price varies with all these factors, holders of securities have the opportunity to profit from the changing price and the necessity that securities be transferable for money.

With securities prices palpable and constantly moving (but without a fundamental tendency around which to move), banks construct securities market for trading, for money capitalists and for themselves as dealers. Banks provide liquidity and also make markets in the sense of constructing the market, providing the necessary infrastructure such as the legal framework and payment, settlement and clearing systems, to facilitate trading. Banks construct infrastructure such as payment and settlement systems to facilitate large and frequent transfers of securities. Clearing houses, which require cooperation among banks, play an important role, negating offsetting deals and reducing the actual transfer of securities. In order to process transactions they also agree and publish reference prices which further establishes the palpability of securities prices and helps securities financing (Hilferding, 1981: 144). The need for the security to be transferable determines the legal form of securities as negotiable and therefore transferable between parties, in contrast to the less transferable legal form of the bank loan. Banks design securities with a high degree of standardisation, increasing their tradability, for example, in the widespread use of English law. It also manifests in standard maturities, coupons and the currency of securities. There is however a limit to standardisation; securities remain claims on particular production processes and not on production in general, and are exchangeable for

[136] For the purpose of analysing banks here it can be assumed that the distribution of surplus value to capital as process is profit of enterprise and is retained by the corporation, e.g. as retained earnings, and its management, and that the distribution to property is interest paid to all types of securities. While Marx argues that wages of supervision – both for coordination and exploitation – will be competed away until they become pure wages (Marx, 1981: Ch. 23), here use is made of the more abstract division. Perhaps more importantly, the distribution between firm and securities argued for here disagrees with Hilferding's (1981) notion that profit of enterprise is capitalised and paid to founders, namely banks and entrepreneurs. It is not clear why the risk premium would not rise to eliminate such a windfall, and Hilferding does not provide a source for the continuing bid-ask or market-making profits that banks make in securities markets after the initial public offering (IPO). In any case the location of profit of enterprise does not materially affect the treatment here of debt, equity and hybrid securities as structured claims on that part of surplus value which is paid to security holders. Banks' capital attracts profit as property and as process where it acts as a specialist in dealings in loanable money capital. Its profits are paid from the money capital of those with which it deals and from the additional surplus value generated by the borrowing it facilitates, as I show in the rest of this chapter.

money; thus their price moves in money terms and they are not generally redeemable at par as credit money is.

4.4 Banks as dealers: specialist attributes and profits

4.4.1 Banks as specialists

Banks are specialists as makers of these markets; they offer a particular process to capital in general which allows them to claim a share of surplus value. As the analysis has expanded to incorporate investment banking, the key attributes of this specialisation have remained very similar to those required by commercial banking. These attributes interact with and are enhanced by the wide network of clients that banks develop, forming a many-to-one relation with the bank, as with commercial banks. In short, and as explored below, banks still i) are experts in credit analysis, ii) have cash to hand and iii) can provide and adapt the infrastructure or institutions of markets – specialist attributes initially identified in the analysis of discounters.

First, banks are experts in credit analysis. Lenders of idle funds, i.e. the buyers of securities, are not likely to be experts in analysing the credit the credit analysis of the borrowing firms; they rely a great deal on the bank's analysis. Although they are likely to replace the bank's portfolio diversity with their own portfolio diversity, they nevertheless trust the bank's reputation for analysing and pricing the security correctly (Morrison and Wilhelm, 2007). Additionally, avoiding the risks of default on loans now involves analysis of the ability to sell the loan (before it defaults) as much as to secure repayment from the borrower. This means that investors replace their confidence in the commercial bank's ability to judge and enforce repayment of loans with confidence in the security dealer's willingness and ability to buy their security from them, and the investment bank's judgement of credit involves an understanding of who is buying and who is selling and their motivations – market makers are uniquely placed to access this information.[137] The capitalist looking to (occasionally) invest temporarily idle

[137] Known as 'colour' or 'flow' (dealers stress the importance of being 'in the flow') in the markets and as 'payoff irrelevant private information' (Gravelle, 2002: 6), or later 'private non-fundamental information' (Cao et al., 2006: 333) in market microstructure theory, this information is also offered to clients when suggesting trades and/or to provide narratives to price

funds is clearly disadvantaged. Note that the banks' credit skills are not greatly altered from the commercial banking attribute of securing repayment by whatever means available, not simply by assessing the technical merits of a production process.

Second, banks have access to cash so they can exchange the security for cash on demand, and investors must be confident that the banks hold cash to buy their securities with. Again, a wide network of buyers and sellers greatly enhances the possibilities of access to cash by finding buyers of banks' securities inventories. In this aspect there is a clear asymmetry with the lone capitalist: the bank, particularly a universal bank, has multiple and continuous sources of cash while the capitalist must rely on the rhythms of the circuit of production and the holding of costly reserves.

Third, the investment bank also brings its money-dealing skills to bear, keeping track of customers, processing payments and often acting as a custodian for securities and so on. Construction of this costly infrastructure requires that the flow of securities through it is large enough to warrant the initial outlay, requiring a large network of buyers and sellers and a large volume of transactions. In fact banks explicitly sell the benefits of this infrastructure to market participants.[138] This last category is somewhat akin to a narrow definition of money-dealing profits (Marx, 1976), although here it is more accurately capital as property dealing, or perhaps loanable money capital dealing.[139] It has both a visible side, such as its custody services, but also a softer, less visible side in the hiring and retention of staff who can perform these operations. Once more, the lone capitalist is at a disadvantage here to the extent that he or she is obliged to use the infrastructure provided by the bank.

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movements. Inasmuch as market microstructure research is slowly starting to acknowledge the importance of such information, it is acknowledging the importance of alternative means of completing the mediation of the M-M' relation.

[138] This selling of services produces fee income and might be thought separate from income from lending or market making; however it remains dependent on a specialist attribute that the bank requires for its core activities.

[139] The analysis so far in this chapter has constrained itself to the mobilisation of otherwise idle monies between production processes. As I discuss in the next section, and as similarly shown for commercial banks in the last chapter, various characteristics of money, credit and banks make them as just able to lend and borrow from outside production. Once this analysis is in place, banks can be analysed as dealers in loanable money capital.

4.4.2 Banks' profit

The form of profit of securities market-makers differs from that of commercial bankers, the difference being dictated by the differences between the form of money capital in each. Securities are streams of interest income capitalised to a lump sum to the present moment; payment to the bank also takes the form of capitalised income, i.e. a lump sum today. In contrast, commercial banks receive a stream of interest over time and aim to pay out lower interest over time; payment to the bank takes the form of periodic interest payments. Capitalised profit to the securities dealer comes from their ability to charge a higher price when selling than when buying, called a bid-ask spread; indeed one definition of market makers might be that they are able to charge such a spread, and the rest of the market participants are obliged to pay it.

Despite these differences in the form of commercial and investment banks' profit, the content remains largely the same. The bank facilitates lending that would not otherwise occur by *creating* a doubling, which for investment banks involves a doubling of money capital into money lent to industry as industrial capital and the claim to income from that capital in the form of a security (sometimes called fictitious capital (Marx, 1981, Hilferding, 1981)). They *sustain* this doubling by allowing the conversion of securities (fictitious capital) to money – in other words they provide liquidity. They *profit* from this, first by claiming a part of the additional surplus value generated, paid both by borrowers from the surplus value generated and from the money capital of lenders, as in the case of commercial banks (see Chapter 3). Second, in the course of providing liquidity, banks also hold a portfolio of securities of their own and so additionally profit from holding their own capital in securities, just as commercial banks lend their own money. This section explores these categories of profit in more detail.

Analysis must differentiate between the two sources of profit, and isolate market-making profit from gains from holding securities (either as a market maker or an investor, from interest payment and from speculative gains), even though in practice the two are comingled. Figure 4.1, below, demonstrates the mechanism by which pure market-making profits arise, in particular isolating the bid-ask spread earned by providing both lenders with access to money (the parallel of

depositors) and borrowers with money to invest for longer periods than lenders would otherwise permit. It does so by making the dealer bank's buy and sell transactions instantaneous.

Figure 4.1 shows three periods, with balance sheets for the actors providing a snapshot of the position before and after each stage, as shown in Chapter 3 for commercial banks. Two investors start with an initial endowment of 10, held in money. In the first period the bank organises the issue of the security and instantly sells it to Investor 1, who receives a coupon during the period. At the end of period 1 the bank has gained some profit from market making and Investor 1 has lent money to the borrower, who has paid over some interest to Investor 1. During period 2, investor 1 sells the security to the market-making bank, which instantly re-sells to Investor 2. The borrower continues to have access to the borrowed funds, while Investor 1 also has access to liquidity. Investor 2 receives a coupon for lending money for a period. In period 3 the banks buys back the security and the borrower repays at par. The borrower has paid 4 in coupons, which have been paid to investors as interest and to the bank as market maker.

Figure 4.1: Market-making profits

Initial Endowments

Bank

Assets		Liabilities	

Borrower

Assets		Liabilities	

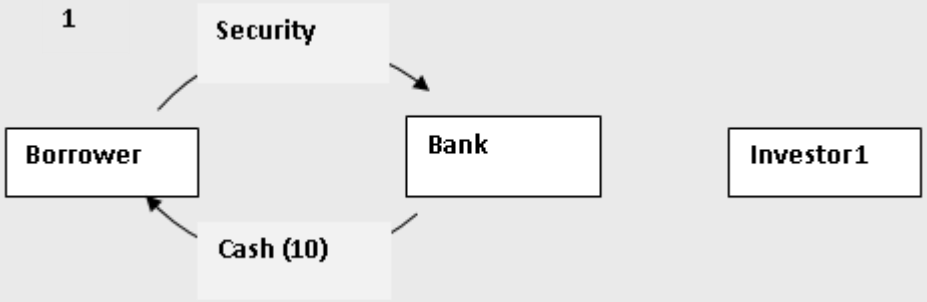
Investor 1

Assets		Liabilities	
Cash	10	10	Equity

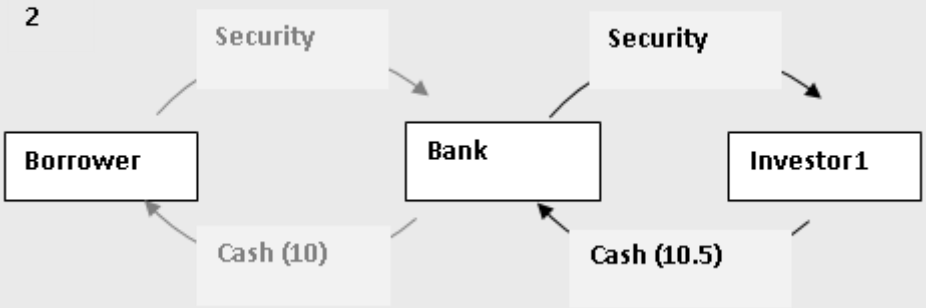
Investor 2

Assets		Liabilities	
Cash	10	10	Equity

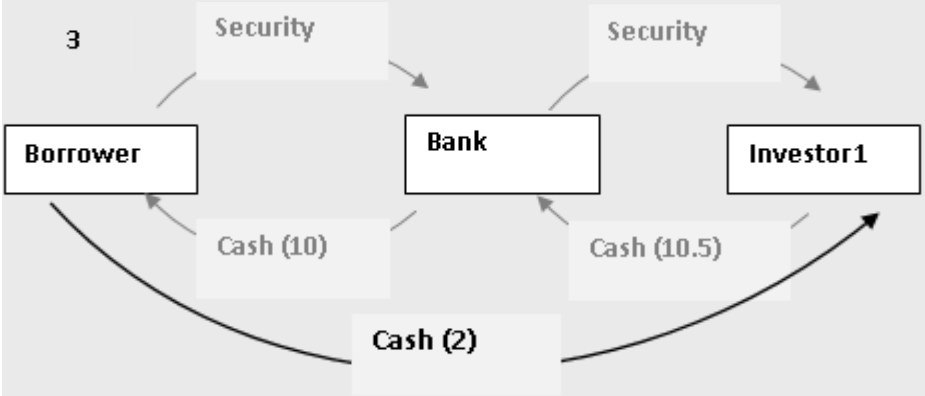
Stage 1



1. Bank issues a security (paying interest of 2 per period) on behalf of borrower. Borrower receives 10 in cash. Bank announces it is ready to buy at 9.5 and sell at 10.5



2. Bank sells instantly to Investor 1 for 10.5



3. Borrower pays interest of 2 to investor 1.

After Stage 1

Bank

Assets		Liabilities	
Cash	0.5	0.5	Equity

Borrower

Assets		Liabilities	
Cash	8	10	Security
		-2	Equity

Investor 1

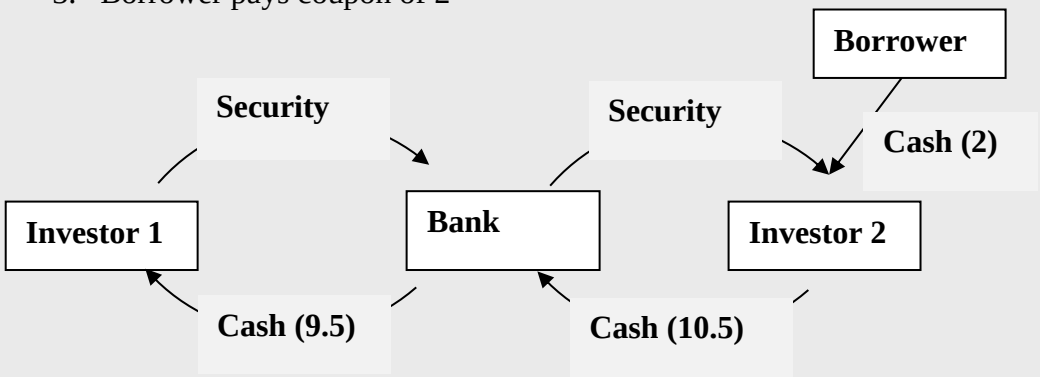
Assets		Liabilities	
Cash	1.5	11.5	Equity
Security	10		

Investor 2

Assets		Liabilities	
Cash	10	10	Equity

Stage 2

1. Investor 1 sells to Bank for 9.5.
2. Investor 2 buys for 10.5
3. Borrower pays coupon of 2



After Stage 2

Bank

Assets		Liabilities	
Cash	1.5	1.5	Equity

Borrower

Assets		Liabilities	
Cash	6	10	Security
		-4	Equity

Investor 1

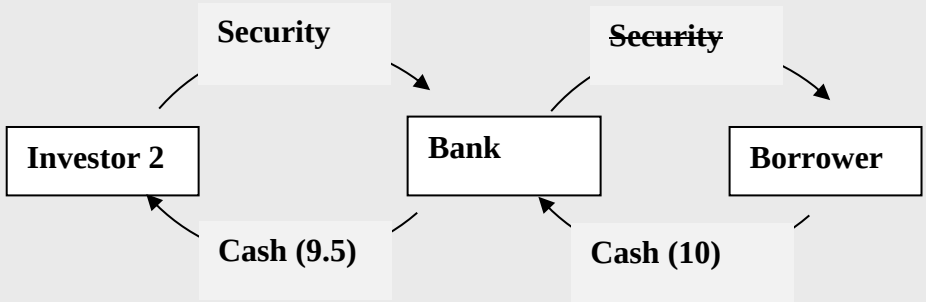
Assets		Liabilities	
Cash	1	1	Equity

Investor 2

Assets		Liabilities	
Cash	1,5	11.5	Equity
Security	10		

Stage 3

1. Investor 2 sells to Bank for 9.5.
2. Borrower redeems the security for 10.



After Stage 3

Bank

Assets		Liabilities	
Cash	2	2	Equity

Borrower

Assets		Liabilities	
Cash	-4	-4	Equity

Investor 1

Assets		Liabilities	
Cash	1	1	Equity

Investor 2

Assets		Liabilities	
Cash	1	1	Equity

Note that the borrower has paid 4, investors have earned interest of 2 for holding the bond, the bank has earned 2 for making the market.

The illustration shows that the profit earned by the investors and by the market maker is not of the same nature. The investors hold the security for one period each. They suffer a loss if the borrower defaults, or otherwise earn interest. The lenders have their parallel in commercial bank depositors who deposit idle money for a short period, the bank's actions allowing idle money to act as loanable money capital.

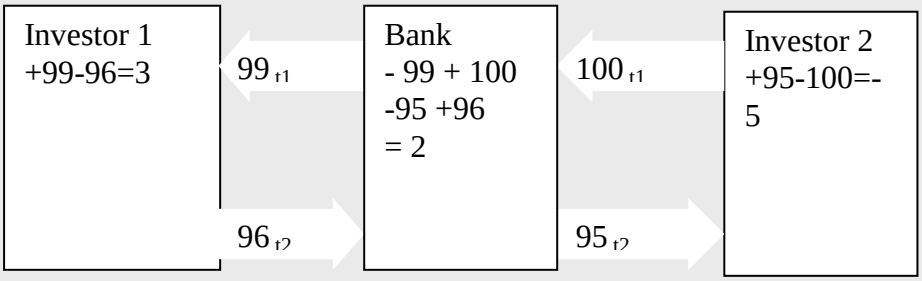
The market maker buys and sells instantaneously, thus earning 2 in total by market making and not by owning securities. The bank's market-making profit arises because it allows lenders access to money before payments from the borrower are complete; in other words the bank completes the mediation of the lenders M-M' circuit before the borrower does by buying the security (Lapavitsas and Levina, 2010).

The borrower pays out 4 in total interest over 2 periods, thus the market maker ends up with a portion of the interest paid, not for holding the security for a given time but for its ability to charge different prices for buying and selling both upon issue of the security and upon providing liquidity to the secondary market. Note that it is assumed, but not shown here, that the borrower puts the money to some profitable use, out of which it pays the coupon.[140]

Although the payment is from the additional surplus value generated, in the first instance it may be from the money capital of lenders. In Figure 4.2, below, the bank completes the M-M' relation for money capitalists by buying the bond, in this case without reference to the borrower (this has been removed from the diagram to isolate the payment from the lender/investor money capital). Figure 4.2 shows the cash flows from buying and selling securities. It shows a zero-sum-game between A, B and the market maker in which price moves represent not interest payments, as above, but price moves due to changes in demand and supply. Clearly the M-M' relation is completed and the bank is paid from the security holders' money capital. More generally, if the borrower pays into the security as envisaged, the security buyer's capital is recompensed by the borrower. If there is a default, this second stage does not occur and the profit of the seller of the security is paid only from the money capital of the holder of the security at default (Lapavitsas and Levina, 2010).

[140] The profit could be configured as Σa - Σb where a is the sale proceeds and b is the cost of purchases. In turn this can be reconfigured as Σpa.qa over na transactions less Σpb.qb over nb transactions where p is price, q is quantity and n is the number of buys or sells. Unfortunately this would beg the question of the joint distribution of a-b, or, more likely, the distributions and correlations of pa, qa, na, pa, qa and na, which are, again unfortunately, unknowable. As above, partly for these reasons the examples in this chapter continue in the simple form of monetary amounts. Such an approach might be typical of a neoclassical exploration of the mechanics of security dealing profits, but, not straying from immediate appearances, it adds little to a deeper understanding of the essence of these markets.

Figure 4.2: Market making profits – no borrower



Investor 1 receives 99 from the bank at time=t1 for selling a security (security not shown). The bank instantaneously sells to B for 100 (charging a bid-ask spread of 1). The market price goes against B and falls to 95. At time=t2 B cuts his losses at 5 and sells back to the bank for 95. A is happy to buy back the security for 96, closing her short position for a profit of 3. The bank makes 2 (twice 1) for crossing bid-ask twice. This is paid from the money capital of the investors.

Taking this further, although the bank is paid out of the additional surplus value generated by mobilising otherwise idle funds, it is not possible to say whether it is paid by the lender or the borrower. It is paid by both, and there is no objective basis for the split between the two. As discussed above, the forces at work in the markets for interest are purely ones of supply and demand among different aspects of capital: the borrowing firm's payments reduce its profit of enterprise while the lender's payments reduce its interest earned. There is no objective or qualitative basis to the split.

The bid-ask spread is paid to the bank as a return to specialist bank capital for facilitating the creation of additional surplus value – similar to the return to commercial banks. It is only the banks' mediation that makes the transaction possible, therefore the bid-ask spread is the starting point and not the end of the analysis; e.g. the analysis cannot proceed on the basis of a (purely theoretical) reference rate such as the mid-price and add the bid-ask as a result of market

imperfections because this implies that a market could exist without the intervention of a market maker.[141]

Mainstream economics in the form of market microstructure theory captures some elements of the bid-ask spread but is limited because it makes the purely hypothetical mid-price its starting point. For example, Demsetz (1968: 35-36) argues that '[t]he ask-bid spread is the mark-up that is paid for immediacy of exchange in organised markets'. The idea of 'immediacy' certainly captures some of the nature of the market maker's closing of the lender's M-M' relation by buying the security before repayment by the borrower falls due. Nevertheless, Demsetz' explanation lies clearly in the micro-foundations tradition of explaining observed phenomena as arising from a deviation from perfect markets, and posits the bid-ask spread as a fair price for a service rendered around a purely theoretical mid-price. Market microstructure theory has built upon the work of Demsetz with a variety of explanations of the bid-ask spread that share these traits. As O'Hara notes:

> [The] idea … of immediacy captured an aspect of the price process not envisioned in the Walarasian framework. … If the actual mechanism used to set prices is not merely a channel to an inevitable outcome, but rather is an input into the equilibrium price itself, then how such mechanisms work cannot be ignored? (O'Hara, 1995: 5-6)

This opens up a whole field of research. As is typical of neoclassical economics, while some elements of the appearance of markets are captured, this approach cannot explain the presence of the markets in the first place without reference to purely theoretical perfect markets.

[141] The same is true for the spread in interest rates charged by commercial banks; e.g. the UN recommends measuring the difference between lending/deposit rates and a reference rate in the measurement of the activity of banks to be included in National Accounts (United Nations, 1993). The banks' ability it price away from the mid- or reference rate in this approach must then be explained as a 'fair price' for a service provided, e.g. bearing risk. The bank's return in the theory put forward here, in contrast, stems from its being a capitalist, which allows it to accumulate others' surplus labour as surplus value because it has property and because it undertakes a specialist process which permits capital as a whole to extract more surplus value from labour, and which gives individual capitalists a chance to gain from speculation. Banks sometimes accumulate via the accumulated money capital of others.

As well as profiting from pure market making however, dealer banks also profit from their own capital (as property) by earning interest and benefitting from price moves. What Figure 4.1 does not show, because it assumes instantaneous resale, is that in making markets a dealer ordinarily carries a portfolio of securities of its own while in the process of buying and selling. Therefore the market maker also earns interest on its own capital. Again, there is a parallel with commercial banks: on the one hand there is the provision of a specialised capitalist process – at its core the doubling of money and credit money by commercial banks and the doubling of industrial and fictitious capital by investment banks, sustained by the specialist attributes of the bank – which facilitates the lending of other people's money. In addition to and as part of this, both commercial and investment banks earn interest by lending their own capital.

The attributes that banks possess as market makers give them an advantage over investors when lending their own capital, either holding securities to earn interest or trading to profit from price moves. As usual, these follow from the asymmetry the develops between bankers, as specialists, and other capitalists. For example their greater access to cash might allow them to sustain mark-to-market losses for longer to allow a position to return to profitability; their greater trading volume might reveal more opportunities than appear to occasional traders, not least because dealers, by being 'in the flow', have access to information that less frequent market participants do not; third, their extensive dealing infrastructure might enable them to move faster than other market participants.

4.5 Lending to and borrowing from outside production

The analysis so far has concentrated on lending to and borrowing from production; however, as with commercial banks, the nature of money and interest generally means that securities markets are as able to collect and lend money outside production as in it. However, the difference in form, and in particular the tradable nature that securities require, mean that there are differences in the sources of money that is collected, as this subsection explores.

Analysis of banks and the relations with and between lenders and is as applicable outside production as within it because of the nature of money and interest, as

exemplified in the M-M' relation or the advance of money now in return for repayment plus and an increment as explained in Chapter 3. Turning first to lending, the lender requires repayment, not in a specific use-value but in money, and will lend to anyone that promises to return money with interest. The separation of the M-M' relation from the mediating process means that from the lender's perspective any process can form the mediating circuit as long as it promises to return M + ΔM, where ΔM = M' – M. Banks, as lenders and as securities traders, are crucial to the production circuit as providers of finance, but they are also separate from it and are able to apply their specialism outside production, including to other financial institutions as well as other banks and others trading securities. As noted previously, the skill of the bank in credit analysis rests in securing repayment and not the technicalities of a production process.

In fact the seeds of this separation are implicit in the joint stock form, even when lending to production: the actual money lent is not repaid but used by industrial capital (the coin lent sets off on its own journey of commodity exchange), and repayment comes from the ongoing results of the production process[142] (Hilferding, 1981). As discussed at the start of this chapter, interest is the return to capital purely as property and in production this means appropriating the product of other people's labour, but the fact that it earns its money while separated from production means that interest is not completely capitalist in character. As a result, interest both pre-dates, as discussed above, and occurs outside production. Analysis must expand from production in industrial capitalism to capture this.

The fact that interest can be earned from outside production makes it, if anything, clearer that funds can be lent from outside production. Whilst the analysis begins with monies falling idle in production, money as the universal equivalent is accumulated in many places in society. Like commercial banks, any revenues that are only 'gradually consumed' can be 'converted into deposits and thereby into loan capital' (Marx, 1981: 636). The establishment of the credit system and

[142] The same is true of longer-term commercial banking investment credit and can be contrasted with trade credit and circulation credit, in which, for example, the onward sale of commodities provides the coin that repays the lender.

widespread banking means that money becomes capital even before it has been advanced; in anticipation of being put to use it is 'latent, potential capital' ibid: 477). Interest on money generally is anticipated before it is lent, so money is also lent from outside production. This is true for both the workings of commercial banks and the purchasing of securities with otherwise idle money.

However, there are differences between commercial and investment banks when it comes to collecting money from outside production, and in the financialised capitalisms of the early 21st century these differences are important to understanding securities markets. Commercial banks remain a pre-eminent site for the collection and concentration of temporary idle monies (Hilferding, 1981). Credit money can be used immediately in a large range of transactions from the smallest to the largest; it becomes money, and is therefore more suited to those who want quick and easy access to money, as discussed above. As money, its value moves against all other commodities in general, or, put another way, credit money (ordinarily) repays at par.

In contrast, securities must be traded each time money is required, incurring transaction costs (hence a certain scale is required) and delay. This tends to lead to larger investments and less frequent exchange for money. Furthermore the price of a security, as income from a particular capital, can move in relation to other assets; i.e. losses might be incurred relative to other assets. One result is that commercial banks are natural buyers of securities (which they incorporate with loans in their diverse portfolio of assets). More importantly, institutional investors emerge holding portfolios of securities, often collecting and investing the idle money of individuals. Analysis of institutional investors and their trading behaviour is critical to understanding derivatives markets and is taken up in the next chapter.

4.6 **Conclusion**

To recap, the growth of joint stock companies crystallises a division between capital as property and capital as process. With this split, the analysis of banks can expand to incorporate a third function; that of securities dealing. Banks facilitate the conversion of idle money into money capital by effecting and

sustaining a doubling between industrial capital and claims to income from that capital. Money is lent to and used by industry, the lender being entitled to part of the borrower's income which, thanks to discounting, can be expressed as an amount of money today. Banks sustain the doubling by maintaining a market in these claims to income, the securities markets.

The use of exchangeability to return the lender to money changes the character of securities markets from that of commercial banking. As in commercial banking, a variety of processes can mediate the lender's M-M' relation as long as it offers a return of money lent with an increment, and therefore securities enable borrowing from inside and outside production (as with commercial banks). The difference now is that in addition, the sale of the security can complete the relationship. When the latter occurs, a security holder's M-M' circuit is completed, not with a stream of income from the borrower but from the money capital of another security buyer (Lapavitsas and Levina, 2010). In completing the M-M' circuit in this way, however, security buyers and sellers are exposed to movements in the price of the security and thus may complete the M-M' circuit through sale with a profit or a loss. Price moves provide the 'carrot of speculative profit' and 'the stick of financial risk' (Eatwell and Taylor, 2000: 3), which helps to give rise to securities trading which is more concerned with price moves than with temporarily investing money that falls momentarily idle in the production process. This trading behaviour is bound up with the emergence of institutional investors, and above all with the emergence of derivatives. The next chapter investigates this.

5 Derivatives: institutional investors and derivatives dealers

5.1 Introduction

Derivatives markets are dominated by banks dealing in financial derivatives amongst themselves and with non-dealer financial firms (see Chapter 1). The world's biggest banks are derivative dealers, and the world's biggest derivative dealers are banks. The theory of bank capital developed in the last two chapters must now be expanded to incorporate banks as derivatives dealers, and in doing so, to explain what is it about banks that has led them to the very heart of these markets and what is it about the derivatives that they trade in that has led to them becoming overwhelmingly used as instruments for financial trading.

Banks have been shown to make activities possible that would otherwise not be possible, specifically by generating efficiencies in the use of money and collecting idle money, concentrating it and lending it. They have been shown to do so above all by issuing claims invested with properties by the actions of banks to make new activities possible. Both commercial banks and securities dealers have done this by turning idle money into money capital for borrowers while lenders are issued with a claim to their lent money. In the case of commercial banks, this claim to money comes to act as money, while in the case of securities it is exchangeable for money. In both cases the issuance and sustenance of the claim is organised by the bank and creates a 'doubling' that gives both lender and borrower access to the benefits of money when they need them, and creates additional lending and additional economic activity out of which the bank itself is paid.

In this chapter I show that derivatives are also a claim issued and sustained by banks' market-making activities, from which they profit, but now the activity that this claim makes possible (and which otherwise would not occur) is not an extension of credit but trading activities – repeated buying and selling with the aim of profiting from price moves. A derivative makes these trading activities possible by being a claim to the monetary proceeds *as if* the exchange had taken

place, without it actually having to take place. Thus derivative counterparties come to act as if they are trading things on a scale and scope far beyond what would be possible if exchange actually had to occur. This is made possible because derivatives are claims and through the properties invested in them by banks' actions, as explored throughout this chapter.

In the last chapter I showed how the exchangeability of securities is inherent in the way in which buyers can return to the benefits of money. This chapter starts in section 5.2 by analysing how institutional investors emerge, providing a separation between securities exchange to manage liquidity and trading to capture price change. Section 5.3 investigates derivatives as a new category, comparing them to securities trading as a way to adjust a portfolio of claims and showing them to be concerned with trading to benefit from price changes and not with the provision of credit. Section 5.4 further examines banks' role in these markets before section 5.5 concludes and briefly compares derivatives trading and gambling.

5.2 The emergence of institutional investors and trading portfolios

In the analysis so far, balances of money falling temporarily idle, whether in production or elsewhere, are exchanged for either bank credit money or securities. While bank credit money acts as money and can itself be used in a large range of transactions, securities must be exchanged for money with a dealer bank. Two key features stem from security exchange, the starting point of analysis in this chapter. First, there is an asymmetry between dealers as specialists and individual lenders which is exacerbated by scale. Institutional investors emerge to aggregate the idle money of individual lenders, and with the resulting increase in scale reduce the asymmetry between lenders – now represented in securities markets by institutional investors – and dealers. Second, and partly as a result of this, the securities exchange analysed in the last chapter is split into two. Additional trading behaviours emerge which stem not from the demands of liquidity, but from the aim of profiting from moves in the price of securities. These two developments are examined further in this section and set the scene for the emergence of derivatives as claims that enable trading behaviours.

5.2.1 Institutional investors emerge

Individuals attempting to invest in securities markets face a large asymmetry of specialism and scale with banks in securities markets. As shown in the previous chapter, banks are specialists and have an advantage over non-specialists in operating in securities markets; furthermore the attributes of banks are enhanced by the scale of their networks. Specifically, small lenders, e.g. individuals, face large asymmetries with banks in credit analysis skills, access to cash and loanable money capital dealing skills.

However, to a large degree these asymmetries can be reduced with scale: many of the problems can be mitigated by building a large and diverse portfolio and borrowing against it, trading more often and building hard and soft infrastructure and technical abilities, e.g. by employing specialist individuals. Institutional investors that concentrate the holdings of many small lenders can therefore mitigate some of the disadvantages that individuals face in trading securities with banks, and can charge for doing so.[143]

Institutional investors emerge from this asymmetry to face dealer banks in securities markets, concentrating idle money from across the economy and building a portfolio of securities.[144] But they are not banks, and in many ways are analytically the opposite of banks. This opposition, and the nature of institutional investors, can be further explored through comparison first to commercial banks and then to securities dealers.

Chapter 3 discussed how commercial banks advance their own liabilities. In order to convince borrowers to hold these liabilities, banks make them of short maturity or even repayable on demand. Thus commercial banks first lend and then borrow. Institutional investors, on the other hand, borrow first. Having persuaded

[143] Theoretically the effect of the emergence of institutional investors on dealer profits might be thought to be ambiguous; on the one hand the reduced asymmetry between dealer and client can reduce margins, while on the other it can attract greater volumes to securities markets. This seems to accord with historical experience of growing securities-markets trading accompanied by a shrinking bid-ask spread. Financial profits have risen, which suggests that the increased volumes more than compensate for falling margins.

[144] Minsky (1996: 358) identifies ‘money market capitalism’ as a new stage of capitalism in America. Edwards (1996: 53) details the empirical changes, showing how ‘households have increasingly placed their money with institutional fund managers’.

investors to hand over their money first, they are under little compulsion to make their liabilities repayable on demand.

Indeed, once institutional investors emerge they act further on the differences (as explained in the last chapter) for individuals with idle funds between on-demand bank deposits and securities investments, which are subject to delay and dealing costs. The liabilities of institutional investors are usually subject to a specific *lack* of liquidity, e.g. lock-up periods in hedge funds, payout only at retirement in the case of pension funds, payout on only demonstrable insured loss by insurance firms and so on.

Partly for this reason, the liabilities of institutional investors do not come to act as money. This is true even when they seem to have other key attributes of bank credit money; above all they face a wide and diverse portfolio of assets (e.g. production processes) across the balance sheet and may even offer to repay at par as, for example, money market funds tend to do. Although this may render the liabilities of some institutional investors into 'near money', e.g. money market fund liabilities, these do not fully act as money, unlike bank liabilities.[145] Institutional investor liabilities remain exchangeable for money, mirroring the portfolio of assets that they buy with their collected idle money.

On the asset side of the balance sheet, there are also differences between institutional investors and commercial banks: despite the apparent similarity of holding a diverse portfolio of assets, there is a difference in the liquidity of these assets. Ordinarily commercial banks do not sell their loans, and develop a close relationship with borrowers, partly in order to assess their ability to repay and the best way to ensure repayment. Institutional investors, on the other hand, rely less on repayment and much more on completing the M-M' relation by selling the security. Therefore the most important relation they develop is with banks as securities dealers. As a result, the relation with borrowers takes on an arm's-length nature not found between commercial banks and borrowers. [146]

[145] E.g. money market fund liabilities cannot be used in a range of transactions, from buying a loaf of bread to buying securities, as money can.

[146] This difference in the number of close relations carries over into derivatives markets. Institutional investors typically rely on a handful of dealers to make markets and provide the market infrastructure while banks as derivatives dealers typically develop thousands of

Moving on to the comparison with securities dealers, there are also important differences here. First, the last chapter showed that securities dealers in the first instance aim to buy and sell securities instantaneously, thereby capturing the bid-ask spread, the form of their profit (the bid-ask spread is paid by institutional investors). Second, any holdings of securities are a secondary consequence of this activity, either because securities dealers come to hold an inventory in the course of making markets or because they feel that their specialist skills give them an advantage in holding securities to benefit from price moves. Institutional investors are again the theoretical reverse of banks here: they first hold securities on behalf of many smaller lenders and savers and then develop trading activities and attributes as a consequence of holding a portfolio of securities. Finally, banks retain a specialist role as dealers in loanable money capital; specifically, securities dealers (market makers) provide market infrastructure. While institutional investors make use of this infrastructure, indeed investment banks sell securities finance, custody and other brokerage services to money managers for a fee; e.g. hedge fund prime brokerage.

In short, banks as securities dealers and institutional investors come to face each other across securities markets, constituting the two main categories of market participants (also the case in derivatives markes as will be seen). Comparing the two reveals that in many ways they are opposites. Institutional investors seek liquidity on the asset side so that they can exchange securities for money, and in many ways aim to reduce liquidity on the liability side. Commercial banks undertake the opposite, illiquid assets being made possible by supplying liquidity to liabilities, while in securities markets investment banks provide the liquidity that institutional investors require.

5.2.2 Trading behaviour

The emergence of institutional investors in this way allows the analysis to divide the exchangeability of securities for money into two new categories: exchange for money driven by liquidity needs and exchange driven by a desire to capture

counterparty relations, e.g.: ‘According to its administrators, the London arm of Lehman Brothers alone had roughly 8,000 ISDA Master Agreements’ (Parker and McGarry, 2009: 16). However, as also noted in Chapter 7, some financial firms sign more than one ISDA Master Agreement, so the number of counterparts is likely to have been less than 8000.

moves in the price of the security. Institutional investors pool investors' idle money to be invested and by doing so can greatly reduce the need to buy and sell securities for liquidity reasons.

As ever, the analysis starts with exchange. As money moves around the economy, some production processes have idle money while others have a shortfall. Put most simply, if A buys commodities from B, A has no money (having given it to B) and must borrow if their commodity is not resold immediately; conversely, B now has money which they invest if they do not buy a commodity immediately. As noted in Chapter 3, the money above allows a pause in exchange, giving rise to credit (Marx, 1976).

In securities markets without institutional investors this would lead to one party buying a security from a dealer and another selling to a dealer as individuals deposit their money into and withdraw their money from securities markets. By pooling these liquidity flows, institutional investors are able to match the withdrawal with the deposit and offset these flows of money without having to buy and sell securities. In this way institutional investors can, to a large degree, insulate their asset side from liquidity demands.

This pooling of liquidity flows covers not only monies used in production processes but also those used across the economy, and can be seen in the typical forms of institutional investor in the early 21st century. For example, as some people retire and draw pensions, new workers enter the market and contribute to pensions; as some pay in insurance premiums, others claim for losses. Furthermore institutional investors, as mentioned, attempt to restrict withdrawals so that they are not forced to sell their assets.

The asset side of the institutional investor balance sheet, then, is to a degree separated from the liquidity demands of depositors. Insulated from liquidity constraints, the asset managers of institutional investors are required to manage a portfolio of securities in the face of constantly-quoted and constantly-moving prices. In the last chapter I explained how constantly-moving and -quoted prices are respectively a feature of interest – a division of a surplus value among capitalists with no centre of gravity around which to tend – and necessary to

securities markets so that investors can exchange securities for money. Banks profit from the exchange of securities for money and so have an incentive to advertise buying and selling prices and to tempt market participants to trade more often and in larger quantities. Institutional investors holding a portfolio of securities are faced with Eatwell and Taylor's (2000: 3) 'stick of financial risk' and 'carrot of speculative profit'. The result is that institutional investors trade to capture price moves by avoiding losses from price falls and capturing gains, and this has come to typify the behaviour of market participants in securities markets.

This behaviour tends to inflate the amount of trading in a given period. First, to profit from relatively small price moves requires trading large amounts in order to capture a sizeable absolute amount of profit. Second, the more trades that are recorded, the more frequently completed prices of exchange can be published; the market price then appears to be moving quickly and so trading becomes more frequent and holding periods shorter. Computerised high frequency trading has become the latest incarnation of this process, with holding periods of fractions of a second and vast numbers of trades completed in a trading day (MacKenzie et al., 2012, Makan, 2011, Grant, 2010).[147]

Finally, briefly and before the analysis moves to derivatives, the trading activities of nonfinancial firms on the financial market can be accommodated within the category of institutional investors. As nonfinancial firms, many of them multinational, increase in size they develop the need for a central treasury department to manage their liquidity needs. In doing so they can also offset liquidity deficits and surpluses within the firm to some extent. Thus any cash surpluses can also become insulated from the daily ebbs and flows of cash within the firm. Nonfinancial firms investing these cash piles in securities face the same situation as the institutional investors analysed in this section and can be treated as such.[148]

[147] The large share of trading taken by HFT and its propensity for errors has led one commentator to remark: 'When events like this happen they just reaffirm that these aren't investors, these are traders' (Popper, 2012).

[148] Nonfinancial firms have become more financialised in a number of ways that can run alongside this treatment as institutional investors and traders in securities markets. As Lapavitsas notes: 'The modern MNC is 'financialised' in the sense that financial transactions are a substantial part of its activities and profit making' (Lapavitsas, 2009a: 15).

5.3 Adjusting portfolios – derivatives as an instrument for trading

At this point, that is with dealer banks facing institutional investors actively trading portfolios of financial claims to capture price changes, the analysis can introduce derivatives. As mainstream economists note, 'institutional ownership of securities has fuelled the growth of derivatives markets' (Edwards, 1996: 54). In Chapter 1 the analysis began with the agricultural, physically-settled derivatives that were the dominant form before the rapid expansion of cash-settled, bank-centred financial derivatives over the last 30-40 years. Derivatives were posited as a way for the producer to adjust his inventory through active trading, and are at once both similar and different to selling the actual produce. Similarly the analysis here approaches derivatives as a way to adjust, through active trading, the composition of a portfolio of financial claims in the form of securities, and now of derivative claims too.

Dealer banks make derivatives markets in the double sense used above: by standing ready to buy and sell and capturing bid ask spread by doing so, and by providing market infrastructure. Derivatives are analysed as claims, issued by dealer banks and sustained by banks' market making, from which banks profit. Securities, also analysed as claims, allowed the doubling of industrial and fictitious capital and thus the production of surplus value that would not otherwise have occurred. Derivatives as claims allow trading behaviour that would not otherwise be possible. This section explores how this is achieved by contrasting the trading of securities with trading via derivatives.

The analysis of derivatives presented here contrasts sharply with the neoclassical tradition, for which the usual theoretical starting point is the increase in efficiency gained by moving towards complete markets (Arrow and Debreu, 1954). Derivatives are seen in this analysis as a cheaper way of completing markets than securities (Ross, 1976). Following Modigliani and Miller (1958, 1961), this activity should be carried out by the owners of a firm and not by the firm itself. Indeed holders of securities (institutional investors) are, as I have shown, the largest traders of derivatives, however they do not generally use derivatives to trade the inputs and outputs of production but use them to trade financial derivatives.

This has not stopped a sizeable section of the microfoundations literature asking why firms hedge (Judge, 2006). Assuming that (nonfinancial) enterprises use derivatives to hedge, the literature attempts to establish why (Smith and Stulz, 1985). It constructs microfoundations using familiar market imperfections such as information asymmetries and taxes; Tufano's (1996) survey groups them primarily under shareholder maximisation and managerial utility maximisation. However Bartram et al's (2009) survey of the empirical testing of these theories finds the results inconclusive and sample-specific, although it can be argued that Covitz and Sharpe (2005) finally seem to obtain more meaningful results by asking *if* firms hedge.

Empirically, however, it has been shown that the major protagonists in derivatives markets are dealers and institutional investors (see Chapter 1); theoretically these opposites have been developed above as traders in securities markets concerned with capturing price moves. Institutional investors hold portfolios of financial claims, securities, and now derivatives as well; adjusting the composition of that portfolio can occur through trading securities themselves or through trading derivatives. The neoclassical argument that these are essentially interchangeable ways of completing markets fails to explain what derivatives are: what is distinctive about them, why they emerge, and why two ways of trading are required. On the other hand, analysis of the differences between trading securities themselves and trading via derivatives demonstrates the role that derivatives play and how they are distinct from securities. This section examines these differences.

5.3.1 Trading without extending credit: a qualitative shift

The first difference between selling and buying securities and using derivatives is that derivatives make concrete a division inherent in securities markets between trading and extending credit to enterprises. In other words, derivatives are leveraged. As shown in the last chapter, trading is an inherent part of extending credit via securities markets; it enables lending by allowing lenders to return to money as and when required. At this point in the analysis any split between the provision of credit and trading for price moves is highly abstract and can only be

made with knowledge of the forms that emerge later, e.g. institutional investors and securities finance such as repurchase agreements.

Introducing securities finance to the analysis creates a crack in the basic analytical category of securities exchange. In securities financing such as repurchase agreements (repos and reverse repos) and stock-borrow-lend, lenders of money hold securities from the borrower as collateral. This lessens the cost of financing securities purchases (collateralised lending being generally cheaper than uncollateralised) and enables short selling (the seller borrows the security and delivers it into the sale, when closing the transaction the short seller buys back the security repays the borrow of the security). More importantly here, it enables the lender of money to lend via securities markets without trading in securities themselves and, critically for an analysis of derivatives, it allows the traders in securities to operate without providing the idle money themselves.

Similarly institutional investors also allow a form of separation between the provision of credit and trading in order to benefit from price moves. Institutional investors take idle money and extend credit by buying securities, but they then separate trading behaviour by pooling and restricting liquidity on their liability side. Both securities finance and institutional investors make possible a separation of roles, with one party providing the credit, the other trading securities. Nevertheless both elements are present in both cases: one is not possible without the other, and the net effect is to provide credit to securities issuers.

Derivatives' trading, however, marks a qualitative shift. It isolates the trading element with no corresponding provision of credit: because there is no underlying exchange there cannot be an exchange of a promise to pay for money. If the emergence of institutional investors cuts financial markets off from lenders, cash-settled derivatives cut them off from borrowers too. The derivative claims issued by the bank do not permit the collection, concentration and on-lending of otherwise idle money as commercial banking and securities dealing do but they do permit trading that would otherwise not be possible. How they manage this is explored below by continuing the logical sequence of the separation of derivatives from securities trading.

Trading without the provision of idle funds is linked with the leverage for which derivatives have become infamous (e.g. IMF, 2002: 54, Dodd, 2005: 155, Gowan, 2009: 14).[149] In valuation theory, a derivative can be replicated with a trade in the underlying security together with securities finance – in other words a leveraged securities trade (e.g. Hull, 2003). Among other things, this leverage allows for a greater volume of derivatives trading for a given amount of money, used to settle the claim, than would be possible in simple securities trading. While the leverage in derivatives is important, making concrete the separation between trading for price moves and extending credit, inherently combined in securities markets, is critical in the theory.

5.3.2 Physical settlement and capital trading costs

The second way in which derivatives differ from securities trading, which reflects their status as trading instruments above all, is the savings in trading costs that arise by not exchanging a commodity or security but by settling the trading profit or loss with a monetary payment between claimants *as if* exchanges have occurred. This can be illustrated by examining the possibilities created by offsetting buys and sells in a physically-settled derivative – analytically a prior form to the cash-settled derivative.

Buying and selling securities incurs various dealing costs for banks: securities and cash must be transferred through payment systems, usually supported by clearing mechanisms; money balances are kept in bank accounts while conversely securities custody is arranged with differences in bearer and registered bonds; coupons must be claimed; and securities finance is often also arranged. Critically when the time comes to sell or buy back the bond the whole process must be reversed. Internal control practices at the bank and at institutional investors require a segregation of duties such that different individuals undertake the different roles of trading, confirming, and settling; furthermore these must be

[149] Leverage is often seen as the source of the danger that derivatives pose to the financial system: 'Financial derivatives allow investors to unbundle and redistribute various risks … [h]owever the same instruments allow market participants to avoid prudential safeguards, manipulate accounting rules, and take on excessive leverage' (IMF, 2002: 54).

controlled and audited both internally and externally. With securities turnover in the trillions of US dollars per day, the costs are significant.[150]

Contrast this with a physically-settled forward derivative on the same single security. On the day of the transaction the buyer agrees to buy a specified asset (the underlying) for a specified price on a specified date – the expiry date – in the future. For the period of the derivative (until expiry) no money or security flows are required and therefore no securities financing is required. Yet on the derivative's expiry date the money and securities must be settled. The only difference so far has been to delay the costs.

Now consider if the derivative to buy the security is followed *before* expiry of the first derivative by a derivative to sell the same underlying security, or indeed many derivatives to buy and sell. In a securities transaction the whole process is repeated with more or less the same costs each time. Because settlement is pushed out in time, and because the underlying asset is standardised, the form of the derivative provides time for offsetting trades to be matched and netted out. At expiry a net position of potentially many transactions can be calculated, and settlement need only occur for a minimum amount. The extension of maturity that the derivative claim entails is suited to repeated buying and selling with no need to repeatedly exchange the asset underlying the derivative. Derivatives might be thought to bring economies of scale for increased numbers of transactions.

In addition the final settlement, even of physically-settled derivatives, may be in cash only. As Cronon (1991: 125) notes of the Chicago exchanges:

> Moreover, the seller of such a contract did not necessarily even have to deliver grain on the day it fell due. As long as the buyer was willing, the two could settle their transaction by simply exchanging the difference between the grain's contracted price and its market price when the contract expired.

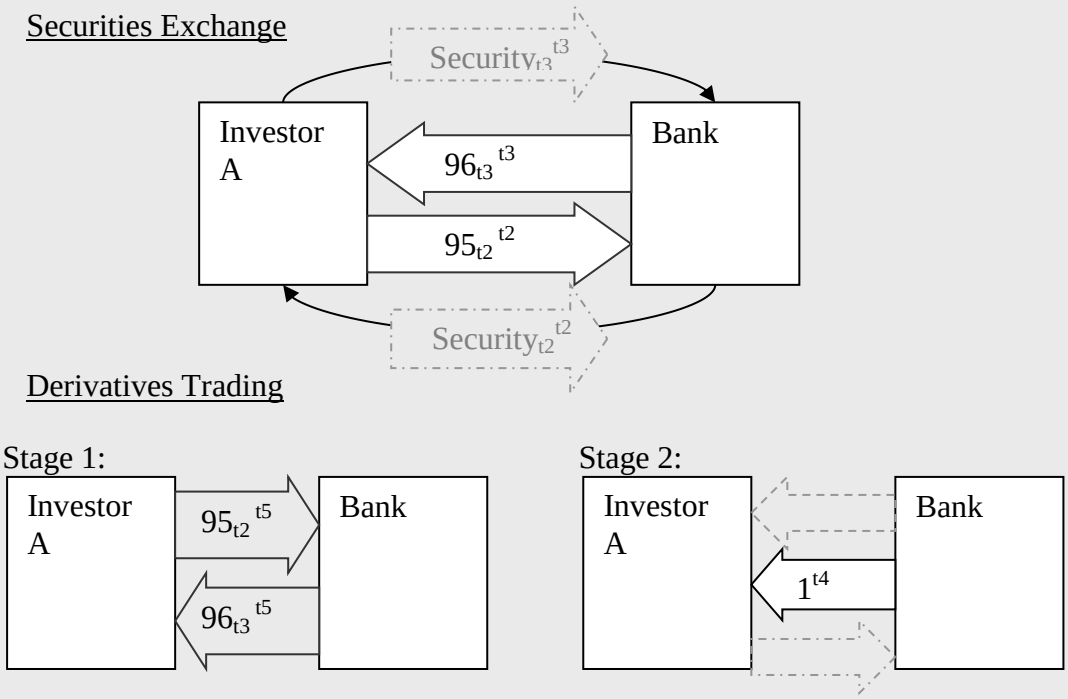
[150] The DTCC alone settled US$1.48 quadrillion of securities transactions in 2009 (Deposit Trust and Clearing Corporation, 2009). Bliss and Steigerwald note: 'securities depositories … track beneficial ownership of securities, record changes in ownership, provide mailing lists for proxies and dividend payments, and so forth. These mundane functions occur on such an enormous scale that centralization provides overwhelming economies' (2006: 27).

With cash settlement, as I discuss below, the derivative's suitability for trading (meaning buying and selling repeatedly to capture price moves) over and above its suitability for exchange of an asset underlying a derivative is made clear.

Figure 5.1 demonstrates the nature of the derivative as a claim and the way in which the cancellation of offsetting trades can occur before the expiry of the derivative with the effect discussed; it does so by comparing securities exchanges with the corresponding derivatives. The securities transaction shows the exchange of money for securities at time t2 and the reverse at time t3. The derivatives transaction (shown in the second part of the diagram) is in two stages. In stage 1 Investor A enters a derivative at t2 to buy the security for 95, to be settled at t5. At t3 she enters a derivative to sell for 96, also to be settled at t5. In stage 2 the bank matches the offsetting trades, terminates them and pays over the profit of 1 in money form at t3. As noted above, no security exchange occurs, no credit is extended to the borrower and there is only a single cash payment between the bank and its counterpart.

The ways in which offsetting trades can be made to net and pay out are manifold. As I explore briefly below and at more length in the following chapters, much of the infrastructure of derivatives markets is constructed to allow equal and opposite claims to net off and result only in a single payment. It can occur by bilateral agreement or multilaterally, e.g. when derivatives are cleared centrally, as usually happens at exchanges. In the case of exchange-traded derivatives the exchange provides the infrastructure to novate all trades to face the exchange and it then terminates offsetting trades, thus helping to minimise the amount of physical delivery that is required. In this case there is no requirement to transfer ownership of the security and the money to be processed in the payments, and clearing systems can be reduced simply to the payment of profit and loss on the trade. Compared to securities trading, therefore, even physically-settled derivatives offer the opportunity to drastically reduce transaction costs where there is substantial trading, i.e. multiple derivatives trades to buy and sell the underlying. These advantages are made clearer with the advent of cash-settled derivatives.

Figure 5.1: Netting and terminating offsetting derivatives



- Here an investor buys at time t2 and sells one period later. Comparison is made between doing so with securities (with same-period settlement) and with a derivative (where settlement is pushed forward to time to t5). This illustrates the money-capital dealing costs savings that are possible even with physically-settled derivatives
- White arrows symbolise flows of money, with the amount of money shown. The subscript now shows the time at which the trade is agreed while the superscript shows the time at which settlement will occur. Also shown here are the security flows in the same direction with the same sub/superscript notation.
- The securities transaction shows the exchange of money for securities at time t2 and the reverse at time t3.
- In the derivatives transaction, grey, solid outline arrows represent the derivatives and white arrows represent money flows, with the same sub/superscript notation.
- In stage 1 Investor A enters a derivative at time t2 to buy the security for 95 at time t5. At time t3 she enters a derivative to sell for 96 at t5.
- In stage 2 the bank matches the trades, terminates them and pays over the profit of 1 in money form at time t4.
- In the derivatives transaction no security exchange need occur, only a single cash payment.
- The derivative transaction extends no credit to the borrower, is highly leveraged and results in considerable dealing cost savings compared to the securities transaction

5.3.3 Cash settlement: the separation of credit and trading

Cash-settled derivatives are the fully-developed form of derivatives, released from the constraints of possible physical delivery. The removal of physical delivery cements the separation of trading from the provision of credit as well as saving dealing costs. Clearing or the termination of physically-settled derivatives before expiry might greatly reduce the incidence of their physical settlement; however, the possibility of delivery remains.[151] Delivery means the exchange of money for an asset, with the dealing costs that this entails, and in some cases the exchange of money for a promise to pay and thereby the extension of credit. The move to cash settlement removes this possibility and marks a qualitative shift in form, opening up a scale and scope of derivative trading that would be impractical or impossible in securities trading. For counterparts to cash-settled derivatives it is *as if* they can trade on anything that can be measured to their mutual satisfaction. Finally, it also further distances financial markets from the broader economy; if institutional investors shut lenders out of the market itself, cash settlement shuts the borrowers out.

With cash-settled derivatives the level of the underlying price index agreed in the contract is compared to the level on the expiry date and the profit or loss settled as a monetary amount. For example if, using a physically-settled derivative, John agrees on Monday to buy at a price of 4 on Friday and on Friday the market price is 10, he has the opportunity to buy for 4 using his derivative and sell for 10 in the market, thereby realising a profit of 6. A cash-settled derivative would simply pay over 6 of money between the counterparts to the derivative on Friday with no exchanges of asset for money. As noted in the introduction, perhaps the clearest example of a cash-settled derivative is a contract for differences:

> An agreement between two parties … to pay each other the change in the price of an underlying asset. Depending on which way the price

[151] As Cronon (1991: 126) says of Chicago's agricultural and exchange traded derivatives: '... however tenuous [the relationship between actual wheat or corn and the derivative underlying] might have become, it could never finally disappear, for one simple reason. No future contract ever overtly stated that it could be cancelled by settling the difference between its price and the market price for grain on a given day'.

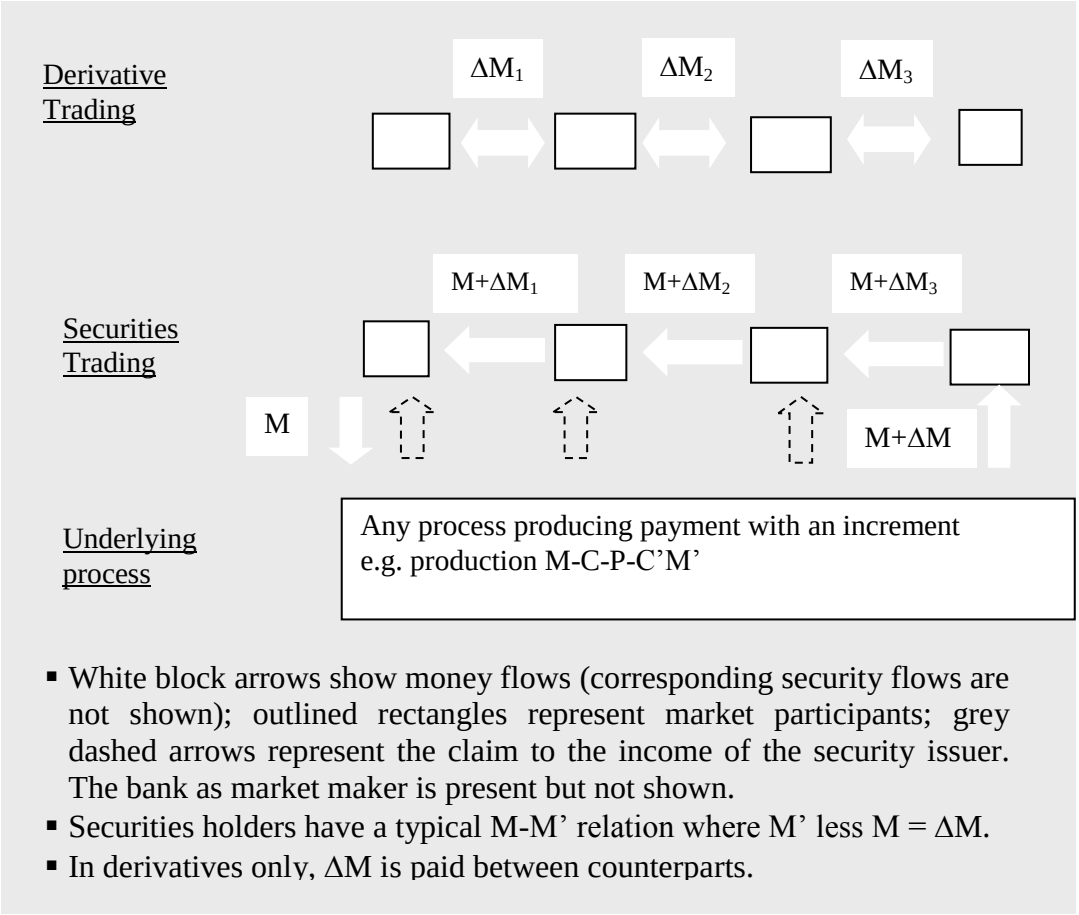
> moves, one party pays the other the difference from the time the contract was agreed to the point where it ends. (lexicon.ft.com)

The movement from physical to cash-settled derivatives presented here is analytical, but it also corresponds to historical experience. Credit default swaps provide an example; as their volume grew it became clear that in the event of a default of a large underlying reference credit, the logistics of gross and physical delivery would result in a disorderly or chaotic situation (Helwege et al., 2009). The result was that the dealers, via the International Swaps and Derivative Association (ISDA), changed the standard documentation to allow not only net settlement but also cash settlement based on the price at an auction of bonds subject to default (ISDA, 2009a, 2009b).

Figure 5.2, below, illustrates how cash settlement separates derivatives transactions from the underlying processes it references, marking a qualitative shift from lending and securities trading. Securities trading, shown across the middle of the diagram, is based on a process that borrows money at the beginning (bottom left of the diagram) and repays at the end (bottom right). As previously, the arrows signify money flows, with the security flowing in the opposite direction and not shown. This may or may not be a production process. Note that while the bank as dealer/market maker has been removed from this diagram for presentational simplicity, it remains as the intermediary between trades. Investors that buy and sell temporarily hold a claim to the income of the underlying process but their circuit is completed by the next buyer (in anticipation of eventual repayment by the borrower), so they can be said to have the typical M-M' circuit of a lender. The repayment differs from the initial outlay as $M' = M+\Delta M$, where ΔM can be positive or negative and is determined by the price movement between buy and sell.[152]

[152] Broadly investor's trading profits along the way are paid out of 'value to be created' as long as there is no default, and from the money capital of the holder of the bond at default is there is. This is explored further below.

Figure 5.2: Cash-settled derivatives are separated from the underlying processes



- White block arrows show money flows (corresponding security flows are not shown); outlined rectangles represent market participants; grey dashed arrows represent the claim to the income of the security issuer. The bank as market maker is present but not shown.
- Securities holders have a typical M-M' relation where M' less M = ΔM.
- In derivatives only, ΔM is paid between counterparts.

Derivatives sever the link with the underlying process, removing the need to advance and repay money and reducing the relation simply to the ΔM of price moves, as illustrated in Figure 5.2. The first implication, as touched upon previously, is that with no advance of money no credit can be extended. This is bound up with the impossibility of exchange of the underlying asset. Credit is an exchange of money for a promise to pay. As discussed in Chapter 3, banking consists of the exchange of promises to pay, one more generally acceptable than the other, e.g. a banknote for a private promise to pay.

A second implication of the severance of derivatives from any underlying borrowing is that, in a narrow sense at least, they become a zero-sum-game: what one counterpart wins, the other loses (Pickens, 2006: 231-2). Once again this

stems from the fact that credit is not advanced. When trading securities, traders are paid out of the borrower's yet-to-be-created value, while a trader that buys and sells a security initially has their M-M' circuit completed with the money capital of the buyer, this is eventually validated with the repayment of the security by the borrower (as long as there is no default). If, as in derivatives, there is no advance to and repayment from the borrower, all that remains is payment from the money capital of one or other of the counterparts.

As a result, while derivatives do not allow for the provision of credit, as bank lending and securities do, the necessity that payment is from a counterpart's money means that they nevertheless involve counterparty credit risk (Duffie and Canabarro, 2003, Zhu and Pykhtin, 2007). In Chapter 3 I noted that the advancer of trade credit, the most basic form of credit examined here, incurs two disadvantages: no money to hand to restart the production circuit and the risk of non-payment.[153] With derivatives, as no money is advanced it might be said that there is no problem of having no money to hand, e.g. to start a circuit of production; however, as a claim on the other party for a monetary payment in the future there is a risk of non-payment. As I show later, the banks' specialism in assessing and enforcing the repayment of credit are put to use in assessing this counterparty credit risk.

5.3.4 Cash settlement: increasing scale and scope of derivatives trading

Cash settlement, the separation of the derivative transaction from exchange of the underlying asset permits a great increase in the scale and scope of trading possibilities. Starting with the scale of trading, first, derivatives trading is not limited by the amount of deliverable asset in existence. For example it is not limited by the amount of security issued by a borrower because by referencing only the price of the security, cash-settled derivatives can be struck in quantities many times greater than the amount of securities issued. Among other things, this

[153] Recall that selling the debt for money to the discounter solved both problems. Selling it to the bank in exchange for a banknote appears to leave the seller of commodities with the risk of non-payment by the bank; however both problems are solved at once when the bank note is exchanged for commodities (illustrating how 'measure of values' and 'means of circulation' are bound up (Brunhoff, 1976: 31)). However, if the seller of commodities on trade credit takes an overdraft from the bank against the trade credit they are able to fund a new circuit of production but are left with the risk of non-payment by the buyer of commodities.

loosens the bonds between the size of production and the size of the derivatives markets. Second, velocity of exchange can become seemingly limitless as simultaneous transactions can occur on the same underlying asset, the sellers safe in the knowledge that they will not have to source and deliver the underlying asset.[154] Third, options are a type of derivative that, amongst other things, allows actors to buy and sell at the same time. The result is that the amount of derivatives traded can become many times greater than the amount of securities outstanding; in this way the scale of production and circulation become even smaller relative to the possible notional scale of derivatives trading.

A second way in which the scale of possible derivatives trading is boosted relative to simple securities trading is through additional trading opportunities from arbitrage activities that derivatives present. Arbitrage is profit from inconsistent prices, and the nature of derivatives affords many more opportunities for such profits than simple securities. Securities arbitrage would typically involve buying in one market and selling in another, e.g. where information flows or trading between the two are somehow restricted. The flexibility of derivatives without the lack of necessity for delivery means that there are more opportunities to find and exploit price inconsistencies.

In many ways the increase in scale is linked to the increase in scope that derivatives make possible. Even without cash settlement, derivatives present the possibility for a large array of instruments on the same underlying price index. Not only are a vast number of maturities possible for the simplest forward buy/sell contracts but additional features, most obviously optionally, can be introduced. This further increases the possibility for price inconsistency and therefore for arbitrage. Most famously, it is possible to replicate an option pay-off with trades in the underlying security to exploit price differences (Black and Scholes, 1973). Similarly, derivatives allow the pooling of many assets into one instrument against which the underlying securities may be traded (e.g. a stock index (Fremault, 1991)) and conversely, the division of one asset into many

[154] As Schumpeter (1954: 320) remarks of the doubling involved in credit money, this is more than an increase in velocity unless it is ‘a velocity so great that it enables a thing to be in different places at the same time’.’ The parallel to credit money can be seen, the claim to the thing coming, in some respects, to act as the thing itself, releasing some constraints and imposing others.

instruments (e.g. dividing a bond into LIBOR interest rate risk and credit spread risk (Bomfim, 2001)). This multiplication of instruments provides more opportunities for inconsistent prices than exist in securities markets alone. Banks as market makers stand to profit from this additional activity and, as with speculation in securities, are also best placed to spot and profit from such opportunities themselves.

Perhaps the most crucial way in which cash-settled derivatives expand the scale of trading activities is by massively increasing the scope of possible things to trade, well beyond that of securities markets, most simply by making it possible to trade the price of things that it is impractical or even impossible to actually exchange. As I explore in greater detail in Chapter 7, derivatives involve the (social) construction of the underlying reference price index. This is most evident for derivatives with undeliverable underlying assets such as those which reference sports results (Eatwell and Taylor, 2000: 101), weather events (Campbell and Diebol, 2003), economic aggregates (Costa et al., 2008) and so on. But, especially knowing these derivatives, it is clear that even in physically-settled derivatives, the underlying of the derivative is not the same as the commodity it purports to reference: e.g. agricultural futures are on a notional, standard quantity of a standard quality and not on the actual wheat of a particular producer.[155] The derivative underlying is in fact a social construction which has increases in tradability as its material roots, and cash settlement greatly increases the scope of underlying price indices which can be constructed.

One important way in which this can happen is through pooling assets and therefore abstracting from the particular to the more general.[156] This abstraction appears almost universally in derivatives – e.g. from agricultural commodities to government bond futures to credit default swaps.[157] Pooling is a form of

[155] In Cronon's (1991: 126) terms: 'Grain elevators and grading systems had helped transmute wheat and corn into monetary abstractions, but the futures contract extended the abstraction by liberating grain trade itself from the very process which had once defined it: the exchange of physical grain'.

[156] Cronon (1991: 132 cited in MacKenzie, 2006: 14) labels the abstraction that derivatives perform in Chicago's agricultural futures markets 'homogonous abstraction'.

[157] One example is the wheat future, an early agricultural derivative traded in Chicago. While it would be almost impossible to trade particular farmers' future production of wheat on a large scale once wheat came to be collected in large grain elevators rather than individual sacks, futures markets emerged. Now grain of a particular quality was gathered together and buyers and

standardisation that can increase liquidity, and one way it does this is by increasing common knowledge between participants. This knowledge does not have to be objective; it is enough that each believes what the others believe, and therefore a belief in diversity from pooling leads to increased common knowledge and increased tradability.[158] Derivatives can increase tradability by abstracting from referencing the price of particular securities to the price of pools of securities. (Carruthers and Stinchcombe, 1999). It is only cash settlement that makes the trading of pools of securities practical; the delivery of multiple securities into a derivative contract would quickly become too unwieldy to be practicable.[159]

While 'homogenous abstraction' (Cronon, 1991: 132 cited in MacKenzie, 2006: 14) increases tradability, there is a limit: derivatives cannot be completely abstracted from the particular to the general and become money, i.e. the universal equivalent. Money, the universal equivalent, does not have a price but forms the price of everything else, while on the other hand derivatives payoffs are determined by moves in the underlying reference index and subsequently in changes in the derivatives price itself. Derivatives must exhibit price moves because their very purpose is to trade to capture price moves.

Finally, cash settlement expands the scale and scope of derivative trading by changing who can trade, because the scope of market participants is not limited to those than can deliver (Das, 2010: 27-9). Thus as long as buyers and sellers can agree on a metric, anything that can be measured can serve as the underlying reference price index for the derivative. By being traded (or perhaps even by simply being proposed for trading) this measurement becomes a price, the critical input of the underlying into the derivative instrument. The cash-settled derivative

sellers of future production could agree on the underlying product that they were trading. Contracts were traded on a standardised quantity (e.g. 5000 bushels) of a standardised quality (e.g. No. 1 white wheat), greatly increasing the tradability of the instrument (MacKenzie, 2006: 13-14).

[158] The role of financial economics in forming these common beliefs is crucial and is explored in a later chapter. Financial economics rests squarely on the ideas of variance and covariance, and in particular on the ideas of risk and return famously outlined by Harry Markowitz (1952).

[159] Indeed the example of stock index derivatives features in the lore of early derivatives markets. The Chicago Board of Trade and the New York Product Exchange wanted to trade index derivatives but were forbidden to do so where no physical delivery was contemplated, as this would have constituted gambling. This in effect prohibited stock index derivatives, as the delivery would be too cumbersome (MacKenzie and Millo, 2003, MacKenzie, 2006).

is a claim for the change in the index, and this gives banks, the economy's specialists in creating and sustaining claims, the ability to invent new derivatives for which they can make markets. At the same time, however, cash settlement imposes limits on who can trade: because there is no exchange, payment comes from the counterpart's money capital and therefore counterparts must be creditworthy.

The underlying to the derivative is a social construct with its material roots in potential market making profits for banks which makes tradable things that previously were not. In this way, for the last forty years derivatives have been the carrier for the spread of 'speculative capital' (LiPuma and Lee, 2005) and the market into ever more areas of social reproduction, but it has been the dealer banks and institutional investors that have carried it there.

5.3.5 Trading claims

Derivatives contain a contradiction: they are an untraded claim that exists to facilitate trading behaviour. A derivative takes the form of a claim against a counterpart, one of which is almost invariably a bank acting as derivative market maker, and as a claim it allows trading that would not otherwise be possible. It allows market participants to act *as if* they are trading the asset underlying the derivative because they can profit from price changes, resulting in the net cash payment from the winner to the loser without having to actually exchange the underlying asset.

At the same time, however the form of a bilateral claim contains restrictions; in short, it is not itself traded. A single derivative is in a sense the equivalent of a buy-and-hold investment in a security, although the purpose of derivatives is not to take buy-and-hold positions but to facilitate increased buying and selling. Both dealers and institutional investors seek trading opportunities; in other words, after trading a derivative they look to lock in profits which manifest themselves in changes in the price of the derivatives they have already transacted. The problem is that the derivative claim itself is not traded; its very usefulness arises from the fact that it is a bilateral claim between dealer and counterpart. Therefore to

capture any price changes in the derivative itself, the trader must trade another, reverse, derivative transaction, another claim against a market maker.

The bilateral nature of the derivative as claim leaves the trader with a problem, because offsetting claims are not automatically fungible. Buying and selling a security results in a monetary gain or loss. Buying and selling a derivative, however, results in a claim and a counterclaim against a derivative dealer. In seeking increased tradability, the derivatives market accumulates a huge pile of claims on dealers which market participants hope they will be able to offset against each other. The very trading behaviour they are designed for leads to a piling up of claims and counterclaims.

Banks, having created derivatives as claims to increase the scale and scope of trading, run up against a constraint or limit that stems from the form of the derivative itself. Banks sustain the market by making a market, standing ready to buy and sell and offering counterparts the chance to trade out of positions they have previously taken by trading a new derivative. But they must also make the market in the sense of developing its infrastructure to cope with the problems of the ever-increasing pile of claims and counterclaims that results.

Much of the content of the chapters that follow is at base concerned with bank practice aimed at overcoming this contradiction and the constraints on the growth of the market that it imposes. They show that much of the organisation of the derivatives markets is about transforming these bilateral claims into fungible, tradable financial instruments. Moreover this infrastructure, from risk and valuation models to accounting standards and the legal and regulatory framework, is much more than an administrative afterthought; it constitutes derivatives markets and, as it struggles to overcome the limits to trading inherent in the form, once again reveals derivatives as trading instruments *par excellence*. Derivatives' material roots lie in the possibilities for trading profits, above all to derivatives market makers as market making profits, and this is reflected in the form they take and the development of this form.

5.4 Banks and derivatives

In the cash-settled derivative, banks as dealers have created a claim which permits trading that otherwise would not be possible. The cash-settled form is the fully-developed form, whose potential can be seen in earlier forms. Dealers sustain such claims by making markets; they stand ready to trade further, potentially offsetting claims, and they provide the infrastructure of the market. The basic ways in which banks profit from the creation and sustenance of these claims and the specialist attributes used in the process are little different from those used in securities market-making and in fact in banking generally.

The content of the profit is, first, a payment to a specialist capital process out of the profits of an activity which it has made possible – here, trading. As with commercial banking and securities dealing, the form of profit follows the form of the instrument in question. In commercial banking, the form of profit is a stream of income over time, the difference between the rates at which the bank lent and borrowed. For securities dealers, the form of profit follows that of the security as a capitalised stream of payments, it is captured by the bank in the bid-ask spread. For derivatives, the form of the profit is also a bid-ask spread captured for standing ready to buy and sell, but following the form of derivatives, this is realised in the future (as in commercial banking) and not on execution of the exchange (as in securities market making). Furthermore, as with the derivative form itself, banks attempt to treat this bid-ask spread as if it has already been paid, and they set up the market infrastructure to allow them to do e.g. cash collateral.

The same essential skills that allow them to do this also allow them to profit from securities trading and commercial banking. First, banks are experts at judging credit risk, and here the ability in securities markets to complete the M-M' relation by selling the security is transformed into trading offsetting derivative claims. In addition, because the claim is between the dealer and the counterpart and not on the borrower, as in securities, derivatives incur counterparty risk (Duffie and Canabarro, 2003). With its established specialisation in assessing credit risk and enforcing repayment, this provides the bank with further advantages which other would-be derivatives dealers do not possess. Moreover,

as in commercial banking, banks must establish a reputation for creditworthiness to persuade counterparts to trade with them. Second, banks as dealers have access to cash to make payouts. Third, they invest in a large payment and valuation system infrastructure with specialist staff in order to be able to handle the huge volumes of derivatives transactions that being a market maker involves. As with securities trading, these three attributes are enhanced by a large network of counterparts. In addition to the return for this specialist role – the return to capital as process – there is a return to capital as property as banks invest their own capital in derivatives, aided by their knowledge of the market and the increased opportunities that this brings for market making profits, e.g. through arbitrage opportunities.

Yet the divorce of trading from credit provision, made concrete in derivatives trading, makes locating the source of derivative profits considerably more complicated than locating other banking profits e.g. from lending. As touched on above, securities are a claim to the income of a particular process, the claim holder's liquidity arising from exchange for money. The security holders M-M' relation is completed initially by the buyer of the security and later supplanted (or not) by the arrival of income from the underlying process (Lapavitsas and Levina, 2010). If repayment from the underlying process does not arrive, the last seller of the security has been paid from the money capital of the last buyer.

In cash-settled derivatives the transaction is completed *only* between the buyer and seller and is detached from any underlying circuit or process. No credit is extended, the advance, M, is no longer exchanged (e.g. for a promise to pay), and the M-M' relation is further reduced to ΔM. The primary claim is now a claim against not the underlying process but the market maker (as counterpart to every trade) on the change in price of the underlying reference price index. The circuit of the derivative counterpart is completed only from the money capital of the other counterpart; unlike securities, where there is a clear link to the yet-to-be-created value of the security in question, there is no clear analytical line either to the source of the money capital or to value creation.

The payment from money capital means that only creditworthy counterparts can engage in derivatives markets. This is both analytically and empirically true: the

counterparts to a large majority of OTC derivatives are the institutional investors discussed above, e.g. pension funds and hedge funds. The need for derivatives counterparts to have access to money capital in order to be deemed creditworthy is consistent with the analytical starting position: that financial derivatives emerge as a way for portfolio holders, e.g. institutional investors, to adjust their portfolios.

While there is no clear analytical line between the creation of surplus value and derivatives profits, some possibilities for linking them arise from the source of the counterparts' money capital. Institutional investors manage the idle money of workers and capitalists, private pension funds typifying the former and hedge funds the latter. In the case of market-makers' profits coming from the money capital of workers, this would suggest either a form of financial expropriation (Lapavitsas, 2009b) or that interest bearing capital has infiltrated and subjugated other areas of economic activity (Fine, 2010). In the case of market-making profits coming from the money capital of capitalists, e.g. from hedge funds, this suggests a lack of alternative profitable opportunities in production or a form of over-accumulation (LiPuma and Lee, 2005). Inasmuch as institutional investors are generally holders of wealth in a financial form, they also earn interest on loans and securities in the usual way, and hence when we talk of the money capital of institutional investors this includes interest and hence surplus value, some part which is paid from production, as well as revenue in the form of interest from outside production. Regardless of its composition, in the first instance the derivative claim is paid from the institutional investor's money capital.[160]

5.5 **Conclusion**

In this chapter the political economy theory of banks based on the work of Marx (1976, 1981) and Hilferding (1910) as outlined and developed in the last two

[160] At a more abstract level, for the institutional investor money capital and interest earned must become inseparable. 'There is not one single atom of [the money capital's] value that does not owe its existence to unpaid labour' (Marx, 1976: 728). This is clear for the interest and dividends it earns and for the savings of capitalists, which are most clearly distributions of surplus value. Matters are more complicated for the savings of workers; one might, for example, ask if interest paid to a worker's pension constitutes a return to capital or the reproduction of labour power. Unfortunately there is not the space to explore this further here.

chapters, is extended to incorporate institutional investors and derivatives dealing. Derivatives dealing is shown to be an extension of the activities of banks, their essence being to issue, sustain and profit from claims to monetary value that allow activities that would not be possible otherwise. For commercial banking and securities market making these activities were made possible by the collection, concentration and lending of otherwise idle money; with derivatives it the trading of underlying price indices is made possible.

Developing from the theory of securities dealers in the last chapter, the scene is set for derivatives markets as institutional investors emerge to reduce the asymmetry between dealers and individual buyers of securities in securities markets. Their ability to pool liquidity and their use of securities finance both highlight a division in the category of securities exchange developed in the last chapter; now the provision of credit via securities markets can be separated from the trading of securities to profit from price changes. Derivatives make this split concrete, and it is only with their introduction into the analysis that trading for price changes emerges without any accompanying credit provision.

The bank as derivative dealer makes this market, issuing, sustaining and profiting from the issuance of derivative claims, using the specialist skill which first separated banks from other merchants (Chapter 3) and allowed them to sit at the centre of securities markets (Chapter 4). Derivatives work as a claim to a payment of money from a counterpart, their value determined by an underlying price index, allowing the counterparts to act as if they have traded – bought and sold – the underlying index without any exchange actually taking place. Among other things, the form allows an enormous increase in the scale and scope of trading activity, as market participants can act as if they can trade things and/or amounts that could not otherwise be exchanged.

This lack of exchange is also central to the lack of credit provision: without the exchange of money for a promise to pay (and the reverse when the debt is settled) there is none of the advance or repayment with interest that forms the typical M-M' circuit of a lender. The sale of a security can close the M-M' relation by reimbursing the security holder, initially out of the money capital of the security buyer, and this is eventually validated from the repayment of the borrower (as

long as they do repay), the difference between M and M' being determined by the change in security price.

With derivatives the only payment is for the difference between M and M', and reimbursement comes only from the money capital of the counterpart. There is no eventual validation from the borrower, e.g. from some additional surplus value that they have generated with the borrowed funds. It is this that gives derivatives the character of a zero-sum game. Not only is a single derivative a zero-sum game in which a winner on one side must reimburse a loser on the other from their money capital, but a string of buying and selling simply extends this. With no extension of credit there is no link back to a borrower who creates additional surplus value.

An argument for derivatives as a positive sum game because they allow for the hedging of risks ignores the reality that derivatives have developed not as insurance, where a specific loss must be demonstrated and/or delivered, but as trading instruments.[161] Derivatives' separation from transactions in the underlying asset itself is based on the advantages this gives for repeated buying and selling to capture price changes (i.e. trading), and precisely for not delivering a loss. An argument for derivatives as a negative sum game stems from the profits of dealers and institutional investors. Their profits from derivatives dealing can only be from the money capital of those who deposit money with institutional investors. Like a roulette wheel, derivatives might be thought of as a zero sum game where the house always takes a cut.

This begs the question: are derivatives gambling? Clearly there are very close similarities between the forms of the contract, any subsequent difference between their labelling being socially determined and subject to change. The best evidence for this is perhaps the 1970s legalisation on cash settlement in the US and UK, which transformed it from illegal or unenforceable gambling to legitimate investment practice at the stroke of the legislator's pen.[162] As legal scholars point

[161] Lynch (2011a) frames the debate about derivatives by contrasting arguments for positive and negative sum outcomes.

[162] Financial activities have long walked a fine line in social status between immoral gambling and moral investment practices: 'For much of the 19th century the stock jobber's trade, for example, occupied the same twilight moral world as the bookie; by the end, stock jobbing become

out, there remains little logic to the division based on the characteristics of the transaction (Lynch, 2011a, 2011b, Stout, 1999, 1995). There are also strong similarities between the dealer and the bookmaker, with the dealer's bid ask (and to a lesser extent the institutional investor's fees) comparable to the over-round margin of a bookmaker (Cain et al., 2000) or the house's cut in a casino.

There are, however, differences that legal scholars might miss by focusing too hard on the form and not the use of the contract. Derivatives develop in the context of an owner of an inventory, above all of securities, finding ways to adjust the characteristic of that inventory by buying and selling, and it is in this buying and selling that the transactions differ. While a bet is typically placed with the intention of holding it until maturity (except where, as with spread betting, activities officially classified as betting have become more akin to derivatives trading[163]), derivatives have explicitly been developed as a way of buying and selling repeatedly, specifically separate from fixing the price of a particular commodity or purchasing insurance – or betting on a particular outcome. Derivatives are trading instruments.

In short, whether gambling or not, cash-settled derivatives are a way for market participants to capture profits from the money capital of others by repeatedly buying and selling and trying to capture price moves. With no extension of credit, the profits of dealers and institutional investors can only be paid by those whose money capital they trade with. It seems doubtful that this is an activity that even a capitalist society should desire for those whose previous role was the provision of credit to borrowers from the otherwise idle money of lenders, to create additional surplus value. To see how international bank regulators have shaped the change in bank activities and the expansion of derivatives activity over the last 30 years, the next chapter turns to international bank regulation and the rise of the Basel Accords.

a respectable occupation for public schoolboys – the first old Etonian jobber dates from 1891' (Froud et al., 2011: 104).

[163] Sports betting is becoming a hedge fund activity, helped by the ability to cut losses and lock in gains as odds/prices move and second trades/bets can be made (Wachter, 2010).

6 Banking regulation and the rise of Basel

6.1 Introduction

The evolution of the role of banks and their emergence as makers of derivatives markets has been accompanied by changing banking regulation. Integrating these changes in banking regulation into the theory of banks developed here enriches and improves the understanding it provides of derivatives dealers and at the same time moves the analysis to a slightly more concrete level, inevitably introducing an element of historical contingency. This chapter first weaves an analysis of how changes in the economy, bank activity and financial regulation develop and affect each other into the theoretical expansion of banking activities outlined in the preceding chapters. This is not the same as building a comprehensive theory of regulation from the simplest categories; after all, banks as derivatives dealers, and not regulation, are the primary object of this analysis. The chapter goes on to show how the new activities and institutional forms require new regulatory forms and the ways in which regulation, in particular the rise of the Basel Accords, facilitates these new activities. This perspective differs from much discussion of the Basel Accords which views them as dealing with the consequences of the growth of new markets (e.g. Underhill, 1991). In this thesis regulation is seen as mediating the relation between banks as specialists and the wider economy in various ways.

As shown in Chapter 1, the explosion in derivatives growth that led to their current size and character began in the late 1980s. However, the expansion of banking activities and the regulatory changes that accompany it must be traced further back than this. In the aftermath of the crash of 1929 and the resulting depression, a regime of financial regulation was put in place that, broadly speaking, suppressed finance. It is best exemplified by the politics of the New Deal in the United States. The New Deal regime began to slowly unravel, especially from the 1950s, and by the time of the eruption of the financial crisis which began in 2007/8 it was almost extinct. In its place, a new regime centred on international financial markets, and the very large international financial conglomerates that make up the core of the derivatives market had arisen. With

regard to the regulation of derivatives, the New Deal regime was typified in the US by the Commodities Exchange Act of 1936 (CEA). From the late 1980s onwards the New Deal regime was gradually replaced in international banking regulation with a regime centred on the BIS and its Basel Accords.

The shift in regulatory regime during the period of derivatives growth under consideration has many facets, and can be and is characterised in several different ways: International Political Economy (IPE) scholars sometimes characterise it as a shift from an American to an international financial order (Langley, 2002, Strange, 1990); it is also a shift from systemic to institutional financial regulation (Lapavitsas, 2011).[164] Thirdly, it is a shift to 'state-authorized self-regulation' (Picciotto and Haines, 1999: 360): '[R]egulatory functions have increasingly been delegated to public bodies or agencies with a status semiautonomous from central government' (Picciotto, 2011: 89). These bodies tend to be specialist, less democratic arms of the state or hybrid private/public regulators.[165] With regard to derivatives markets important examples of such include central banks and banking regulators, and organisations of derivatives users themselves e.g. ISDA.

While incorporating elements of these shifts, this chapter is grounded in the theoretical understanding of banks developed in the preceding three chapters. First, banks, and accumulation more generally, are intimately connected: banks emerge from merchants as specialists and as a result they and the wider economy remain mutually reliant. Regulation plays a role in mediating this relationship and therefore, second, it is possible to see how existing regulation influences the form of new banking activities, either by permitting them or, more often here, as banks seek to escape their regulation. This makes it possible in turn to see how bank activities influence the form of new regulation, as regulation sometimes adapts to permit new activties and sometimes more proactively facilitates them.

The shift in one form of regulatory environment to the other, especially between the 1950s and the start of the financial crisis of 2007/8, is analysed in two parts.

[164] Freixas and Rochet (1997: 259) , describe Glass-Steagall from a neoclassical perspective as typical of 'structure regulation' and 'capital or reserve requirements ... a typical conduct regulation.'

[165] '… the doctrine of the "arm's-length" relationship has been a central figure of constitutional rhetoric in Britain and a key device to insulate the workings of agencies with delegated functions from the accountability pressures of the democratic state.' (Froud et al., 2011: 108)

The first half of the chapter addresses the expansion of banking activities. Regulation can be seen mainly to shape the form of bank activity as banks seek to take on new activities outside the framework of its constraints: commercial banks take on increased securities dealing and institutional forms change, with the emergence of institutional investors and banks as derivatives dealers. Regulation is adapted, mainly through liberalisation, to both encompass and permit these new activities. This process might be termed deregulation (Cerny, 1991).

The changes in bank activities and consequent changes in institutional form alter the relation between banks and the wider economy, requiring new regulation to mediate this. In particular this need arises because of one of the contradictions of banking. Banks are the economy's specialists in assessing credit, but in order to operate they themselves must convince the rest of the economy, i.e. non-credit specialists, of their creditworthiness so that non-banks can be persuaded to hold bank liabilities (credit money and others). Banks must both manage their assets (broadly, they must remain solvent) and convince others that they are doing so and that therefore bank liabilities are a safe bet (broadly, banks must remain liquid).

The Basel Accords that arise to regulate the new bank activities in a process of re-regulation that accompanies deregulation are analysed in light of how banks (and the rest of society) manage this contradiction (Cerny, 1991). The second half of the chapter addresses the ways in which re-regulation arises not just to encompass and permit new activities but also to facilitate them.[166] Presenting these processes of de- and re-regulation separately helps to highlight the differences between the old and new regimes and moreover emphasises that, contrary to neoclassical theory, financial markets are not something that spring up when all rules are taken away but rather are governed and defined by tacit agreement between banks and the wider economy, some of which is set down as banking regulation.

This chapter both forms a pivot in and replicates the broader structure of this thesis. It marks a move from more abstract, theoretical analysis of banks' evolution and their role as derivatives dealers to a slightly more concrete analysis

[166] In this facilitation re-regulation might be seen as a shift in favour of finance.

of the practices they have undertaken to develop the infrastructure derivatives markets since the 1980s. The preceding chapters deal with the theoretical expansion from discounters to commercial banks to securities, and then to derivatives dealers, the first half of this chapter re-examines this expansion of activities through the lens of the processes of deregulation.

This and the remaining chapters analyse the practices that have gone into making these markets, and especially how they are made by and for banks as dealers (and for institutional investors as the counterpart to dealers). This chapter generally addresses international bank regulation; the next explores the contractual form and its role in the growth and change of character of derivatives, and the final chapter addresses the ways in which the new system is regulated by risk management practices. These three areas of practice become essential to the running of large-scale derivatives markets and as such become entrenched, taking on an objectivity which affects the growth and in particular changes the character of these markets.

Section 6.2 discusses banks' expanding activities in light of the existing regulation and the way the regulation changes to encompass and permit these new activities. It builds from commercial banks and New Deal regulation to increases in banks' activities as securities dealers and the changing institutional forms that have resulted, including the rise of institutional investors, before discussing the emergence of the OTC derivatives markets. Section 6.3 discusses how these changes are reflected in new regulation. It analyses the rise of the Basel Accord, starting with the theoretical relation between banks and the wider economy and discussing the form that re-regulation takes in light of banks' moves offshore, and then turns to market-based activities before discussing the treatment of derivatives in more detail.

6.2 **Expanding bank activities**

6.2.1 Changing forms of regulation of the relation between accumulation and banks

The expansion of bank activities, explored theoretically in the previous chapters, has been accompanied by shifting forms of regulation. This section analyses the

changes in regulation that have accompanied the expansion of bank activities in advanced capitalism – namely the expansion from commercial banks to securities dealers, the rise of institutional investors and the emergence of banks as derivatives dealers.

Bank regulation is analysed as one manifestation of the relation between banks and the economy more generally and is one way in which this relation is mediated and regulated. The analysis is approached by examining first the mutual reliance of banks and the rest of the economy, and within this, banks' search for greater profit (and conversely the rest of the economy's ability to restrict this); and second, how this is mediated by the existing regulatory structures. The forms that regulation and banking take can only be understood by including this mediation.

As Picciotto and Haines (1999: 368) put it:

> The underlying dynamic of changes in the social structure of finance (the social patterns of saving and investment), has generated new competitive pressures mediated through institutional and regulatory forms, which have played a major part in shaping the new financial system. Far from being a lawless new frontier, financial markets are riddled with regulation at every level… Markets do not and cannot exist independently of rules – they are created and shaped by rules.

Markets here can be seen as including those for commercial banking and investment banking activities.

The mediation or regulation of the relation between the economy generally and banking and finance will at any time mix elements stemming from the reliance of the economy on banking with elements stemming from the reliance of finance on the rest of the economy. Opportunities for banks to profit are closely bound up in this. Although New Deal regulation appears to repress finance and the Basel regime appears to give it a freer hand by facilitating new activities, nevertheless opportunities for banks to profit appear under both regimes, supported by some measures and restricted by others, as I show throughout this chapter.

The rest of this section shows how bank activity can react to existing regulation in various ways, focusing mainly on how banking attempts to evade regulatory constraints, and on how regulation sometimes accommodate these changes.

6.2.2 Commercial banks

The regulatory structures in place might be thought to influence bank behaviour by encouraging the behaviours that they permit. The events of the 1920s and ’30s can be framed in this way. The regulatory structure of banks in the 1920s might be said to have allowed banks to extend increasing amounts of leverage, including to institutional investors who used it to buy shares and financial assets. This build-up of leverage in financial markets and the economy more generally burst in 1929 and the early 1930s with successive stock market crashes at the centre of events (Galbraith, 1992).

The crash of 1929 and the depression that followed prompted a clampdown on the speculative behaviour, and particularly financial speculation, that was seen as responsible for the crash. As Tinker (1997: 34) notes: ‘The New Deal era saved the heaviest guns for regulating finance’. The 1933 Banking Act (the famous Glass-Steagall Act) was followed by the completion of the Senate Committee on Banking and Currency (the Pecora Committee) investigation before derivatives were addressed in the Commodity Exchange Act, 1936 CEA). The CEA put into place a regulatory form and regime that restricted banks’ activities, and in particular might be thought to have restricted them to commercial banking activities.

6.2.3 Securities markets

However, regulation can also influence bank behaviour as banks attempt to take on profitable activities outside its framework. Sometimes, ‘grouped under the euphemistic heading of “financial innovation”, [new activities enabled] Wall Street Banks to escape regulatory restrictions and expand their activities and profits’ (Gowan, 2009: 15). When analysing these new activities and the emergence of banks as securities dealers, changes in the economy generally and in its relation with finance can be linked with a change in the scale of finance, e.g. as changes in the economy call for increased financing. To understand how

this growth manifests it is necessary to analyse how regulation mediates the relation between banks and the economy more generally. Finding their profits and activities constrained by the New Deal regulation, banks sought profits and activities outside the regulatory framework e.g. in securities markets.

The dynamics between the economy, banks and regulation are well illustrated in the opening up of the Eurodollar markets. First, in the wider economy there was an increase in international trade following a relaxation of current account controls in the 1950s; second, these changes in the economy were associated with changes in banks' activities; and third, the form of these changes was mediated by the existing regulatory structure as banks sought to evade controls and operate outside its framework.

Increasing international trade in the late 1950s and early 1960s led producers and merchants to require a corresponding increase in access to trade finance, but they still faced strict capital controls. At the same time, British banks were searching for ways to expand their international business:

> During the 1957 sterling crisis they stumbled upon the Eurodollar market as a solution to their problems. The catalyst for the market's development were the restrictions on British banks' use of sterling to finance trade between countries outside the sterling area. … The London bankers found they could satisfy this demand [for trade finance] by offering dollar loans against their dollar deposits of overseas residents. This business proved so attractive that when the restrictions were removed in early 1959, bankers continued their new Eurodollar activity. (Helleiner, 1994: 84)

The emergence of the Euromarkets revealed in international banking the first cracks in the New Deal's restrictions on competition.[167]

[167] Parts of the UK state were not averse to this development, seeing it as a way to 'reconcile the goal of restoring London's international position with the Keynsian welfare state and Britain's deteriorating economic position. The Bank of England was the most active proponent of the Eurodollar market. It not only refrained from imposing regulation on market activity, but took several important measures … permitting the growth of a Eurobond market' (Helleiner, 1994: 84).

Turning first to changes in the real economy and the growth in finance, and leaving aside changes in form, it can be seen that only a partial explanation emerges for the changes in banks' activities. The growth in Eurodollar markets was associated with a growth in trade, as seen above, and, bound up with this, the situation of the United States, the leading global economy at the time (Barkin, 2003). The growth of the Euromarkets, which had the support of parts of the US state (Helleiner, 1994), was associated with an emerging 'dollar overhang' (Underhill, 1991: 201) whereby the US found that it was able to support a current account deficit with international borrowing due to the willingness of exporters to the US (and others) to hold dollar-denominated financial assets. The recycling of petro-dollars through the Euro markets[168] and deposits of dollars in these markets by the Soviet Union are important examples of the increase in offshore/international financial activity as a result of trade and the emergence of the US dollar as a world money.[169] Changes in the domestic US economy, not least a demographic boost to savings as baby boomers reached working age, also influenced the growing scale of finance (Edwards, 1996: Ch. 3).[170]

While a change in the scale of finance can be associated with changes in the broader economy, in addition, credit creation begets further credit expansion. Bank lending creates both financial assets and liabilities and fuels an expansion of finance relative to the rest of the economy. The accumulation of claims and counterclaims creates a quantitative growth in these markets that marks a qualitative shift to an era of finalisation which is distinct from times when credit grows in tandem with the rest of the economy.[171]

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[168] The USA vetoed IMF recycling of petro dollars through the IMF in 1970 (Helleiner, 1994: 101-114). 'It was left to the market institutions of the London-centred Euromarkets to undertake so-called petro-dollar recycling' (Langley, 2002: 86). Many of these 'market institutions' were, of course, American banks.

[169] The Soviet Union used the Eurodollar markets to house dollars to avoid interference from US authorities (McCauley, 2005: 60).

[170] The choices of these savers, as I will show, depended on regulatory structure, but they also on faced an inflationary environment from the late 1960s which affected their choice of financial instruments (Edwards, 1996: 13).

[171] Langley (2002: 90) notes: 'While partly resulting from contemporary state and corporate financing requirements, the increased volume of credit created through world credit practices and associated capital movements also arises from financialisation. As with the periods from the 1740s to the 1790s and the 1870s to 1914, a structural feature of contemporary world finance is the *expansion in the value of credit created due to the speculative accumulation of capitalist world credit practices themselves*' [emphasis added].

However, looking solely at changes in the scale of finance only takes the analysis so far. It is not possible to understand changes in banking without analysing how existing regulation mediates the changes and in so doing affects the form of finance that results. The conjunction of the growth described above with the existing regulatory structure, i.e. the New Deal regime, led to a period of financialisation that is different from previous instances; in particular, 'current financialisation is evidenced by the sheer extent of secondary trading practices' (Langley, 2002: 91).

The regulatory structure, however, shaped this expansion in bank activity not so much by what it permitted as by banks' actions *outside* its framework in light of changes in the wider economy. New Deal regulation stifled bank activity, constraining profitability. Banking developed new activities that escaped its control in two interrelated ways: they developed both more offshore international activity and more investment banking or market-based activity.

First, banking became more international, with increased offshore activity, especially in the Eurodollar markets. On the one hand changes in international financial regulation increased the demand for international finance: currency controls put into place in the 1930s had both prevented and reduced the need for international banking and its regulation, and allowing increased international trade led to greater demand for international finance. On the other hand, the continued constraints to onshore banking activity pushed banks to expand their activities offshore, where they were able to evade onshore controls. British banks trading in the Euromarkets, i.e. outside the control of sterling, were soon joined by American banks operating on British soil.

The move offshore was more than simply a move to a space where new activities could occur because the British authorities looked the other way. Euro-market activities fell between the authority that the Bank of England felt it had over British banks and that of the New York Federal Reserve over activities in London. The authority to impose regulation requires that the regulator has autonomy from those being regulated (Poulantzas and Camiller, 1978). Banking activity under the New Deal regime was constrained within national borders by currency controls; as a result the state, as regulator, had a large degree of

autonomy and therefore the authority to maintain strict control of banks' activities. In the international setting there is no autonomous body with such authority.

Regulation, as the mediator between banking and the wider economy, adapts to new activities, attempting in various ways to re-encompass them even if only by permitting them. A new form of regulation was required for these new banking activities, and their international offshore aspect was important to the form of the new regulatory regime that emerged, as I discuss in the second half of this chapter. Without an autonomous international body that can exert authority in the way that nation states can, international banking regulation takes a different form: it requires cooperation among states, from which consensus and agreement must be sought.[172] In the new form of regulation that arose, the Basel Accords, this literally took the form of regulation by committee, and agreement often proved difficult to achieve (Schenk, 2010). [173]

As well as the move offshore, the tight control of commercial banking prompted banks to turn to market-based activities. Its control of prices and quantities of credit was a 'market-negating' element of the New Deal regime (Lapavitsas, 2011). For example, Regulation Q of the 1933 US Banking Act set limits on various interest rates and the quantity of loans for lending against securities (Edwards, 1996). Coupled with inflation, these constraints on commercial banking activity prompted market-based activity as banks sought to compete outside the framework of the existing regulation. For example, as a reaction to the constraints of Regulation Q, commercial banks in the US invented the certificate of deposit as a way of paying interest (Bannock et al., 1998). As Edwards (1996: 13) notes:

> The rise in inflation beginning in the late 1960s led to higher interest rates and made investors more sensitive to yield differentials on

[172] Keynes and White at Bretton Woods highlight how cooperative action on an international scale was required to control capital flows. As discussed, in the absence of an international body capable of enforcing such an agreement it was easy for the UK and US to 'cheat' on the agreement, or at least to look the other way, and for the Eurodollar markets to become established (Helleiner, 1994).

[173] Even when cooperation is in the interests of all, the difficulties of regulation by committee remain, not least because of variations of free rider and collective action problems (Stigler, 1974).

> different assets. The result was the so-called dis-intermediation process, in which depositors took their money out of banks paying low interest rates (on both checkable and time deposits) and purchased assets with higher yields.

As above, regulation is the mediator of the relation between banks and the rest of economy and therefore adjusts to changes in banking activities, if only to permit them: 'The growing disadvantage of banks in raising funds led to their supporting legislation in the 1980s to eliminate Regulation Q ceilings on time deposits and allow checkable deposits that paid interest' (Edwards, 1996: 16). The deregulation that followed also saw the end of the era of informal supervision and moral suasion (Schenk, 2010), and its replacement with a raft of new rules and formal regulation and supervision (Picciotto and Haines, 1999).

Banks' turning to securities markets was also important offshore. Chapters 3 and 4 have shown the theoretical importance of money markets to the functioning of commercial banks and the related emergence of securities markets as an investment banking activity. This was played out in the Eurodollar markets as the 'influx of U.S. banks and multinational corporations transformed the Eurodollar market from a short-term money market into a fully-fledged international capital market serving needs that had previously been met by the New York market' (Helleiner, 1994: 89).

6.2.4 Changes in institutional form: banks as dealers and institutional investors

These changes in banks' activities as they turned offshore and to financial markets in order to operate outside the established regulatory framework, can be seen as contributing to changes in the institutional form of banks and other financial institutions. The changes have been categorised as i) a trend towards universal banks mixing commercial and investment banking; ii) the emergence of massive financial conglomerates; and iii) the emergence of institutional investors (Langley, 2002).

First, new activities led to growth in the number of banks combining commercial banking and financial market activities. The New Deal regime constrained the functional form of domestic banks (Lapavitsas, 2011). Only banks were permitted

to offer demand deposits; geographical restrictions kept banks small; and, most famously, investment and commercial banks were separated by the law (Edwards, 1996). But this formal separation of onshore commercial and investment banks mattered little in the offshore Eurodollar markets, where both types of banks were active in market and investment banking activities. Once again, these developments came to be reflected in regulation as they adapted to the reality of new bank activities. For example, new onshore and offshore activities began the erosion of Glass-Steagall's separation of commercial and investment banks which was completed in the early years of the 21st century (Kregel, 2010a).

Second, only larger institutions were capable of opening overseas branches, a move which allowed them to extend their activities considerably; at the same time the smaller domestic commercial banks that could not or did not venture offshore remained constrained by domestic regulation, contributing to the emergence of two tiers of banks. As domestic liberalisation continued, however, removing the barriers to interstate banking, smaller local banks became prey to larger ones (Mishkin, 1996). Bank consolidation in the US saw the larger international banks swallowing up many smaller domestic banks to leave the banking sector even more dominated by the largest 'mega' banks, the same institutions that dominate derivatives markets (see Chapter 1).

Third, the rise of institutional investors, so large a part of derivatives markets and examined theoretically in Chapter 5, can be seen in the twin turn offshore and to the market. The same pressures to evade price and quantity controls that led to the invention of, for example, certificates of deposit also led to the rise of institutional investors such as money market funds. It was possible to structure such funds to replicate, outside the framework of regulation, some of the deposit functions constrained by New Deal bank regulation (Campbell et al., 1988). Similarly, institutional investors emerged to allow savers access to the growing securities markets. As mentioned above, additional savings were looking for a home during the period, e.g. the saving of baby boomers. The domestic financial systems that individuals could access most easily were still restricted by New Deal regulation. As discussed in Chapter 5, individuals face disadvantages, mainly of scale, in operating in the financial markets where the most attractive

solutions to their needs were to be found and where institutional investors emerged to fill the space created by the asymmetry between dealers and individuals. In this way institutional investors both emerge from and contribute to the growing volumes and changing character of finance manifesting in growing financial markets.

Banks acting as both commercial banks and securities dealers, together with emerging institutional investors, set the scene for the emergence of banks as derivatives dealers. Indeed, '[t]he spectacular growth in the use of derivatives instruments has … been closely bound up with the disintermediated and financialised form of contemporary world credit practices' (Langley, 2002: 91).

6.2.5 Derivatives and escape from the CEA regime in the US

The emergence of banks as derivatives dealers and in particular of over-the-counter (OTC) derivatives markets can also be analysed, like the securities market above, as an instance of banks seeking new activities and sources of profit outside the constraints of the existing regulatory framework which limits activities and profitability. Regulation, however, continues to mediate the relation between the wider economy and banking, and as a result adapts to changes in the relation. This subsection shows first how new derivative activity is permitted by deregulation. The next section shows how the very constraints shown in this section to be evaded by banks' actions and removed by deregulation are re-regulated under the Basel Accords.

While exchange-traded derivatives remain important, the key to understanding the evolution of banks and their role as derivatives dealers lies in studying the rapid expansion of OTC markets from the 1980s onwards. Two key moments can be used to mark the beginning of this change: first, the legalisation of cash settlement in both the UK and the US, discussed in Chapters 1 and 5, which heralds the birth of a qualitatively different instrument; a change which might be considered necessary but not sufficient to subsequent developments; and second, discussed here, the exemption of OTC derivatives from the Commodity Exchange Act (CEA) of 1936.

As Chapter 5 discussed, derivatives are firstly an agreement between two parties, or, put another way, a claim on a dealer. A derivative, as a negotiated, private and non-transferable agreement, distinguishes derivatives from the publicly-known, standardised terms of the transferable security. This distinction is also the basis on which their exemption from the regime of the CEA was built.

In the mid-1980s the most important derivatives markets were in the US, dealt in agricultural produce and were exchange-traded. Derivatives were to a large degree regulated as they had been since the 1930s. In the midst of the Great Depression, the 1936 Commodity Exchange Act (CEA) was passed as part of a clampdown on the speculation that was blamed for the crash and was seen to continue to disrupt agricultural production in the depression years.[174] The CEA required that all futures were traded on exchanges, making those not on exchanges illegal. This corralling ensured that the regulator, the CFTC, was able to exert control over derivatives practices.[175] In short, the derivatives industry was confined to exchanges, regulated by law and supervised by a single federal regulator, the CFTC.

Dealer activity in exchange-traded derivatives markets is constrained in a variety of ways. First, competition among dealers in the design of contracts is constrained, as it is the exchange which designs the contract. Second, banks cannot compete by offering better credit terms, as at the end of every trading day each trade is novated such that every participant faces the exchange as a central counterparty. To protect the creditworthiness of the exchange standard, margining and other credit enhancement processes are put in place. This has the effect, third, of suppressing competition among dealers with respect to the amount of market risk they can take relative to their capacity to absorb losses (more market risk requires a bigger cash margin). Fourth, again given the

[174] There are slight differences between securities and derivatives in this regard. Attempts to limit speculation in derivatives markets can be seen before 1936; the fact that the asset underlying derivatives was overwhelmingly agricultural and not financial was important. For example, the 1921 Futures Trading Act tried to tax speculators but was short-lived, overturned by a decision in the Supreme Court. The Grain Futures Act of 1922 had more success but did not go as far as the 1921 Act (Swan, 2000: 249-253).

[175] The Act and CFTC enforcement provided public and transparent pricing; disclosure of the real counterparts to the federal government; regulation of intermediaries i.e. brokers and employees; stringent rules for customer protection; processes to detect unlawful trading; prohibitions against fraud etc and; enforcement of all of this by the federal regulator (Greenberger, 2010).

centralised nature of the exchange, dealers are restricted in the amount of operational risk they can take as the mechanics of settlement, accounting, payments and so on are centralised and hence standardised for all parties.

The late 1980s however saw the growth of OTC contracts which were, as the name suggests, different from the standardised instruments trading on established exchanges. OTC contracts, typified by swaps, are privately negotiated between parties and require specific tailoring and were undertaken outside the framework of the CEA. One of the earliest transactions of this kind was between the World Bank and IBM in the early 1980s, and involved the swapping of coupons of offshore bond issuance.[176]

The World Bank swap can be seen in the light of the offshore borrowing made possible by the Euromarkets, but, perhaps more importantly, OTC derivatives can be seen as banks' derivative activity escaping from the constraints of the CEA. Moreover the derivative escapes in its basic, or perhaps naked, form, shorn of the clothing of institutional support provided on exchanges (e.g. clearing, cash margining and so on); it is a private claim between two parties that is intended to remain in place until a series of cash payments referencing an underlying index have been completed.

Starting with a CFTC Policy Statement in 1989, OTC derivatives became steadily more exempt from the provisions of the CEA on the basis that they are private, tailored claims between two parties (and not standardised and public as futures were). A pattern established itself between 1989 and the Commodity Futures Modernisation Act (CFMA) of 2000 that 'declared financial derivatives exempt from CFTC or SEC oversight' (Stout, 2009: 7).[177]

[176] The bank had reached its limits on Swiss Franc and Deutsche mark borrowing but preferred to pay the lower rates in these currencies than the 17% it would pay on US dollar borrowings. At the same time IBM had borrowed in the European currencies and had made large unrealised gains on their depreciation. It wanted to secure these gains by switching to US$ denomination. The bank therefore borrowed in US dollars and IBM, in Swiss Francs and Deutsche Marks, and the two institutions entered into a currency swap. IBM effectively paid the USD coupon and principal of the World Bank debt and the World Bank paid the principal and lower coupon of the European currencies (Kapur et al., 1997).

[177] Even the long-term capital management crisis, in which OTC derivatives were heavily implicated, failed to stop the process: a CFTC concept note attempting to roll back the clock on OTC deregulation was suppressed in no uncertain terms. On the very same day of the CFTC concept note, 'Robert Rubin, then U.S. Treasury Secretary, joined with Alan Greenspan, then

OTC derivatives activity grew steadily, dominated, as seen in Chapter 1, by the largest banks acting as derivatives dealers. Dealers were then able to point to the resulting and ever-larger pile of OTC notional outstanding and argue for stronger legal status for existing trades, as it was felt that the 1989 exemption, for instance, did not provide enough legal certainty. By the late 1990s there was more than USD50 tn of OTC derivative notional outstanding (BIS, 2011). The threat of this all being deemed legally invalid put the market firmly into the 'too-big-to-fail' category (Greenberger, 2010). Regulation was progressively loosened and the exemption progressively strengthened to validate existing trades.[178] In theory this made the financial system safer by lessening the threat of trillions of dollars-worth of invalid contracts, but in doing so conditions were only improved for ever more derivatives trading.

In short, OTC derivatives escape New Deal regulation on the basis of being bespoke, private claims between two parties. Banks as dealers seek a space in which to operate outside the existing framework of constraints in their quest for increased profits, each bank being incentivised to trade as much as possible to increase profits. As volumes grow, market participants must put measures to support them into place . International banking regulation adapts to and has a role to play in supporting these ever-increasing derivatives volumes, with the result that these markets simultaneously de- and re-regulate (as especially noted by international political economists). Piccotto (2011) notes how markets cannot exist on this scale without organisation, rules and regulations; and Vogel (1996: 3) states: 'We have wound up with freer markets and *more* rules. In fact, there is often a logical link: liberalization requires reregulation'. Accordingly, areas previously constrained under the CEA, seemingly de-regulated with the move off

Chairman of the Federal Reserve Board and Arthur Levitt, then Securities and Exchange Commission (SEC) Chairman, to caution against [the] proposed Concept Release' (Baker, 2010).

[178] In a 1989 policy statement, the CFTC set forth the criteria for trades that they would exempt from the requirement to trade on an exchange and be subject to CEA provisions. The 1992 Futures Trading Practices Act clarified on what grounds the CFTC could exempt transactions from the CEA, stressing again the tailored, nonstandardised nature of OTC. The CFTC followed this with a 1993 rule on exemptions, putting the 1992 Act into practice. In 1999 the Presidents Working Group on Financial Markets recommended removing 'legal uncertainty' (Presidents Working Group on Financial Markets, 1999). Finally, in 2000 the Commodity Futures Modernisation Act (CFMA) 'removed OTC derivatives transactions … from all requirements of exchange trading and clearing under the CEA so long as the counterparties to the swap were 'eligible contract participants' (Greenberger, 2010: 9.)

exchanges – credit, market and operations risk-taking - become progressively re-regulated under the Basel regime. Driven by the incentives and practices of banks seeking to expand their OTC dealing, derivatives markets are re-regulated, and during the process the character of derivatives is transformed, as the rest of this chapter now explores.

6.3 **Regulating banks' new activities: the rise of the Basel Accords**

The expansion of banking activities associated with the deregulation of the New Deal regulation of the 1930s, explored in the last section, required re-regulation. The most prominent regulations to emerge as a result were the Basel Accords, which were agreed among advanced capitalist nations in the Basel Committee on Banking Supervision (BCBS) at the Bank for International Settlements (BIS). These are analysed in this section to show how the developments outlined above influence the form of the new regime. The analysis shows how the turn offshore is associated with the form of the regulation by international committee, and how the turn to the market requires price risk to somehow be brought 'on-balance sheet' so that liability holders can have some information about it. This is achieved with a capital adequacy requirement. It goes on to show how – particularly for derivatives – credit, market, and operational risk are steadily incorporated into the Basel regulations. To achieve this, the analysis starts with the theoretical nature of banks developed in the preceding chapters, but especially in Chapter 3.

6.3.1 Banking theory, systemic risk and too big to fail

Very briefly put, banks emerge from other merchants as specialists. They come to increase the efficiency of the use of money in the economy and mobilise idle money, transforming it into loanable money capital in the process. In doing so, they come to lend their own liabilities, to support which as money they must make them of shorter maturity than the loans they have extended. Banks are already the economy's specialists in assessing and ensuring repayment of credit, and this transformation puts non-banks at an even bigger disadvantage. As a result, banks must always find ways to reassure liability holders. Typically this involves diversification of their portfolio, including having cash to hand and

lending and borrowing in the interbank market. It also involves finding ways to manage the temptation to over-leverage, or, put another way, to hold insufficient capital to sustain losses and remain solvent. Finally, they must boost their reputation, not only by actively managing their assets but also by convincing others that they are doing so.

Banks' emergence as specialists gives rise to a mutual reliance between them and the rest of the economy (see Chapter 3). This can be explored by looking at first the asset and then the liability side of banks' balance sheet. Bank assets are fundamentally made up of loans to the rest of the economy. The banks reliance on rest of the economy as a result of this is clear; not only do profits flow from the broader economy but also the failure of the rest of the economy to pay will make them insolvent. The mirror to this is that the rest of the economy has come to rely on bank credit in order to operate.

The reliance of the rest of the economy on bank lending in combination with the expansion of finance has led to an increased perception of systemic risk. Especially since the onset of the latest financial crisis in autumn 2008, systemic risk has once again come to the attention of global financial regulators. A report for G20 finance ministers and central bank governors recently defined systemic risk as:

> … a risk of disruption to financial services that is (i) caused by an impairment of all or parts of the financial system and (ii) has the potential to have serious negative consequences for the real economy. Fundamental to the definition is the notion of negative externalities from a disruption or failure in a financial institution, market or instrument. (Staff of the IMF BIS and the Secretariat of the FSB, 2009: 2).[179]

Specifically, the rise of very large financial institutions during the period of deregulation has led lender of last resort (LOLR) functions of central banks,

[179] The threat to the economy from finance is thought to come from two channels. First, through a chain of contagion: most obviously from one bank to the rest of the financial system, and from there to the rest of the economy. Or second, simultaneously: from one bank sufficiently large and connected that the shock hits finance and the broader economy at the same time (George, 1998).

regulators and/or governments to include 'too big to fail' – a term that can be dated to the mid-1980s.[180] As finance continued to grow, so too did the perception that the default of some institutions posed too big a threat to the system – when they found themselves in trouble it was simply imperative for the economy in general that these institutions were not allowed to fail. The financial crisis that began in 2007/8 has provided ample examples of this, including the American International Group in the US and the Royal Bank of Scotland in the UK.

The growth of finance and the form it has taken, with very large banks and other institutions giving rise to systemic risk and too-big-to-fail, appears to have provided banks and finance generally with a certain amount of structural power (Strange, 1990). Nor is this constrained to the rescue of individual organisations; the escape of OTC derivatives from CEA regulation can be seen in the same light, as regulators and lawmakers apparently felt that they had little choice but to continuously remove legal uncertainty in the face of trillions of dollars of OTC notional amounts outstanding.[181]

The rest of the economy's reliance on banks continues to be made clear when analysis turns to banks' liabilities, particularly because a large portion of the liabilities of commercial banks serves as money, but also because banks' debt more generally is held by the rest of the economy, default on which would cause disruptions to capitalist accumulation. The flip side of this, however, is that banks are reliant on the rest of the economy to hold their liabilities; as Chapter 3 has shown, it is only by doing so that banks can come to lend and to operate more generally. The rest of this chapter analyses the Basel Accords in light of banks' reliance on the rest of the economy to continue holding bank liabilities

[180] '[I]n September 1984 the Comptroller of the Currency testified before Congress that some banks were simply 'too big to fail' and that for those banks total deposit insurance would be provided (O'Hara and Shaw, 1990: 1587).

[181] In the aftermath of the bailout of the financial system of 2008/9 the problem of systemic risk is being addressed in part not by reducing the size of or reliance on finance but by providing a 'legal framework for winding down such firms in an orderly way in the midst of a crisis' i.e. preventing contamination of the rest of the system, hence the rise of measures such as 'living wills' and 'administrative liquidation' (Bernanke, 2012, Fitzpatrick IV et al., 2011).

6.3.2 Maintaining confidence in bank liabilities in the light of deregulation

The changes that occurred during the deregulation process impacted negatively on banks' ability to present themselves to liability holders as a safe bet in a number of ways. First, constraints on bank behaviour also came with a degree of protection from the authorities. Banks subject to laws such as the 1933 Banking Act were very low credit risks: between 1934 and 1980 an 'unusual calm' descended and 'systemic banking panics or waves of bank failures became a distant memory' (Calomiris, 2000: 1). Both activities outside this framework of constraints / protection and the gradual rescinding of that framework increased uncertainty about banks' ability to meet their liabilities.

Second, and in combination with the first point, the scale and nature of banks and borrowing firms grew. The bank manager who relied on her knowledge of the local economy to assess and enforce repayment was redundant in an era of large, international credits given to big, complex institutions, both banks and non-banks, on an ever-increasing scale. Banks themselves were larger and more complex, with accompanying division of duties and formalisation of processes and, as part of this, the use of statistical techniques to manage the scale of their commercial banking and financial market activities. On the other side of the relationship, borrowers were now also larger more complex organisations.

Third, in addition to scale, the nature of the business changed from take-and-hold positions in commercial banking credit to buy-and-sell positions in securities and derivatives. For outsiders, this made judging the banks' portfolios harder as their composition could change much more quickly than previously; for example banks could become rapidly undiversified. In addition, the rise of buy-and-sell positions greatly increased their exposure to price changes in comparison with commercial banking activities under the New Deal regime. Once again, these changes made judging banks' creditworthiness considerably harder for outsiders. The processes of ensuring the solvency and liquidity of the banks' assets had to adapt to the new activities, and banks had to find new ways to persuade outsiders that they were managing these new risks.

6.3.3 Regulation by committee

Markets do not simply spring up, or emerge when rules are removed: they are made.[182] From the 1980s onwards banks were making derivatives markets for themselves, and one of the most important tasks in this was addressing perceptions of their creditworthiness in the new environment. Above all, the new environment was represented by the growing, ever-more integrated and international, financial markets. With no single international body able to impose regulation, international cooperative agreements among bankers were at the basis of the new regime (Underhill, 1991: 215). The eventual form of these agreements was the Basel Accords on Capital Adequacy, as Underhill (1991: 216) reports: 'The political demands for convergence on the question of capital standards came as much from international banks and other financial institutions as from governments and central bankers themselves'..

As discussed above, while currency controls kept banking and finance corralled within national borders, governments were autonomous enough to exert authority over them. By contrast, international regulation had no such autonomous body, and agreement came via a committee of central bankers at the BIS.[183] Within the BIS, the BCBS was to be the location for the new international bank regulation. Formed in 1974, the Committee issued its first Capital Accord (Basel 1) in 1988, (BIS, 1988). The members of the committee are nation states, 'represented by their central bank[184] … The Committee does not possess any formal supranational supervisory authority, and its conclusions do not, and were never intended to, have legal force' (BIS, 2009). Committee members must come to an agreement among themselves as representatives not of the BIS but of their nation

[182] Fine and Lapavitsas note that markets comprise and are sustained by complex social relations and can rarely serve as a starting point for analysis (Fine and Lapavitsas, 2000).

[183] The BIS statutes state that the 'first object' is 'to promote the cooperation of central banks', cooperation that 'should be evident in continuous and daily practice rather than as an emergency manifestation' (BIS, 1935: 41, Toniolo, 2005). This took the form of monthly meetings for the world's leading central bankers (Helleiner, 1994: 17). It is a more private international financial institution than the International Monetary Fund and was in contrast to the general spirit of the Bretton Woods agreement, which called for its closure. (Helleiner, 1994) However, it escaped closure, and as the Bretton Woods agreement became less important throughout the 1960s and 1970s the BIS correspondingly increased in influence as a place where central bankers met both regularly and in the cases of financial crises.

[184] … 'and also by the authority with formal responsibility for the prudential supervision of banking business where this is not the central bank'. (BIS, 2009).

states. They express this agreement in 'broad supervisory standards and guidelines' (ibid.), and individual nations then take the necessary steps to implement the standards in their respective countries.

Regulation by committee of national representatives lacks autonomy from those it is trying to regulate compared to national governments and their own banking systems, and because of this constraints on bank action in the Basel Accords have operated in the context of the ever-increasing derivative volumes. Representatives are likely to vote in their own interests or those of their constituents, limiting the ability of the committee to impose solutions against those interests. The actions of the BCBS appear to have achieved some degree of autonomy, given the strong status of the Basel Accord, and the Accords might be argued to have provided a level playing field, potentially against the interests of some representatives. Nevertheless, the committee cannot seem to override the incentives of all dealers to increase the amount of derivatives traded and it can be argued that the Accords focus on improving the feasibility and safety of these growing volumes. Above all, national banking regulator representations to the committee are likely to be shaped by existing bank practices to manage these risks, and thus regulators have little option but to represent the interests of banks at the BCBS. As a result it is unsurprising if regulation is focused on facilitating and improving the safety of ever-more, ever-faster derivative trading.

Finally, regulating the market via the capital requirement of the market makers creates an 'Other', i.e. those that engage in derivatives but are not directly regulated under Basel. This 'Other', comprising principally institutional investors (including, for example, the now notorious shadow banking system (Pozsar et al., 2012)), could not exist under the CEA regime when all trading institutions were obliged to trade on the principal focus of regulation, i.e. the exchange, and were themselves regulated. The preceding chapters have made clear, however, that this division between market makers and the rest is first and foremost built upon the specialist attributes of banks as dealers and market makers and the asymmetry that this creates with other uses of derivatives. Re-regulation has taken up this division and acted upon it, because it is the market makers that are most

represented at the heart of the regulatory regime, i.e. by bank regulators on the Basel Committee.[185]

While the international element of expanding bank activities is strongly associated with the form of the regulatory body, i.e. an international committee, the expansion of bank activities to include financial market dealing is associated with the specific form of the regulation and its focus on capital adequacy, as the next section explores.

6.3.4 Putting risk on the balance sheet.

If the move offshore is associated with form of the regulator, namely the international committee, the turn to markets may be more closely associated with the form of regulation itself, namely the bringing of risk onto bank balance sheets through capital adequacy requirements. The use of new risk-management techniques based on mathematical valuation models (discussed further in Chapter 8) was at the centre of banks' management of their new activities. These practices were standardised and formalised in the Basel Accords and, by setting a risk-based capital adequacy requirement, risk was brought onto the balance sheet. To some extent the capital adequacy requirement constrained bank activity, but, at least as importantly, it signalled to liability holders that risk management was practiced, capital was set aside and banks' activity was constrained.

The quantity of bank lending and capital held is published for outsiders in financial accounts via the balance sheet; under the Basel Accords the banks attempted to include incorporate the quality, specifically the risk of loss, of this lending in the balance sheet as well. The Accords set a minimum capital adequacy ratio (in the initial Accord a minimum ratio of 8% was agreed). The ratio is calculated between a capital requirement and the amount of capital held.

Turning first to the amount of capital held, capital was already shown on the balance sheet, but a way of standardising its measurement across the various

[185] Gowan posits the shadow banking sector an outgrowth of the banking system rather than as a competitor. In many ways this fits the view presented in Chapter 5, of institutional investors and banks facing each other in financial markets and relying on each other to generate profits. Gowan goes on to argue that the while banks have been re-regulated under the Basel Accords, to a large extent the shadow banking system represents the growth of a deregulated sector alongside it (Gowan, 2009: 13-14).

capital instruments that banks all over the world were issuing was required. Agreement was relatively straightforward. These liabilities were classified into a relatively small number of categories (instrument types); furthermore, for the issuers of these liabilities there is no need to consider their own creditworthiness.

When it came to measuring the capital requirement to be incorporated in the capital adequacy ratio to capture the riskiness of bank assets in the bank balance sheet things were more complicated. Measurement needed to be standard across banks, and to be capable of convincing outsiders that the risk of non-payment of bank liabilities was captured, managed and to some degree mitigated by capital. Those agreeing the standards published in 1988 in Basel 1 were only able to agree on a relatively limited and simple incorporation of risk into the balance sheet via the capital requirement.

First, there are many sources of potential loss. Basel I covered only credit risk and country transfer risk, perhaps the clearest risks that a commercial bank faces, and, like capital, the quantity if not quality of which was already measured on the balance sheet. However, Basel I also acknowledged that 'there are many other kinds of risk – for example, investment risk, interest rate risk, exchange rate risk, concentration risk' (BIS, 1988: 8). Discussion evidently covered these other areas, but agreement on them was postponed.

Second, the main challenge was how to include the riskiness of the banks' assets in the capital requirement and thus on the balance sheet. In order to standardise the measurement of different assets, Basel I categorised borrowers into different types and proposed standardised risk weights for each category. The Accord itself acknowledged that this was unsophisticated,[186] and presumably this simplicity represents, to some extent, the limited ability of the BCBS to agree more complex common standards.[187]

[186] 'The framework of weights [was] kept as simple as possible and only five weights [were] used - 0, 10, 20, 50 and 100%' (BIS, 1988: 8).

[187] In another example, the decision to offer zero weights to Organisation for Economic Co-operation and Development (OECD) countries was chosen among several options mentioned in the Accord – the OECD grouping included South Korea and Turkey, which were both to experience financial crises before the introduction of Basel II.

As well as reflecting the slow process of agreeing standards by committee, however, the limited scope of the Basel I Accord also reflects banking practices at the time. In the mid-1980s, when agreement was being thrashed out, the huge trading portfolios, and in particular the massive derivatives markets of today, were not yet in evidence. The Accord that emerged reflected bank practice at the time, and as I show below, as the financial markets and particularly derivatives markets grew, new Accords came out which to reflected evolving practices a large degree.

6.3.5 The treatment of derivative under the Basel Accords

As derivatives dealers, banks sought to increase the volume of their derivatives trading and in so doing developed a series of practices that came to be incorporated into the Accords. The central contradiction of derivatives in this regard is that they are untraded claims which arise to facilitate trading. One result is that existing trades are not sold to capture profits from price moves; instead, new, offsetting trades are undertaken. Managing the implications of this piling of claims and counterclaims is central to all the more detailed practices explored in the second half of this thesis. I show here that even though OTC derivatives escape the New Deal regulatory constraints on credit, market and operational risk-taking, the Basel Accords re-regulated these, albeit differently, and that managing the contradiction of trading with untradeable claims is at the heart of this re-regulation.

The treatment of derivatives under Basel evolves over time, reflecting changing bank practices and the growth of the market. In Basel I, derivatives are treated primarily as credit exposures to a counterpart (BIS, 1988). Market or price risk is subsequently included with the amendment of 1996 (BIS, 1996). Basel II includes a capital adequacy requirement for operational risk and updated treatment of counterparty credit risk (BIS, 2006). Finally the market risk inherent in derivative counterparty credit risk, known as the credit valuation adjustment (CVA) is also included in the capital adequacy calculation in Basel III (BIS, 2010, revised June 2011).

This subsection traces the above developments and shows how they develop as banks' practices aiming to regulate their relation with the wide economy. Risk management practices develop, bringing risk onto the balance sheet and so communicating with liability holders. These different categories of risk also build on each other to cumulatively address the contradiction of derivatives as untraded claims for trading, and in doing so transform the character of derivatives into something closely resembling the standardised, apparently tradable claim of exchange-traded derivatives.

Under Basel I, derivatives were treated as a claim in much the same way as loans. A capital requirement for counterparty credit risk was calculated: the exposure calculation method was the current replacement value of the contract (RV) plus a percentage add-on that reflected that variable nature of the exposure. Offsetting exposures to a single counterparty were measured with a net replacement value, but add-ons were calculated gross per counterparty and were determined by basic categories that were similar in nature to the credit risk weights and which attempted to capture the different volatilities of different underlying index prices or risk factors. As the name suggests, the use of net replacement value assumes that exposures are replaceable in the market. However, the assumption behind gross add-ons limits this to replacing net exposure to each risk factor one at a time. Derivatives in this regulation look principally like loans whose repayment amount can vary (BIS, 1988: 12-13).

This treatment reflects the practices of OTC derivatives as they emerged in the late 1980s as one-off bespoke claims on other counterparts, not overwhelmingly aimed at trading in and out of the underlying index to profit from price changes. Yet even as Basel I came into force, banks' activities were moving on, in part reflecting the delays inevitable in agreeing and publishing international regulation by committee. They were also facing new dangers stemming largely from the growth of bank activity in financial markets. In particular, they faced losses from price moves, and the speed at which portfolio composition could change increased; new measures were required to convince liability holders that banks were sufficiently diversified. The dangers posed by this activity to individual

banks and to the system more generally were brought home by the crash of 1987.[188]

In 1996 the BCBS formalised the new market risk management practices in an Amendment to the Capital Accord to Incorporate Market Risks, thus bringing into the capital requirement, and thereby onto the balance sheet, a new source of loss for liability holders (BIS, 1996). Basic methods for measuring the price risk – the so-called standard approach – were available, but for the largest dealers the new accord meant the introduction of the advanced-models approach and the calculation of capital requirement based upon a value-at-risk (VaR) model. VaR simulates changes in the market value of a bank's portfolio and calculates a capital requirement based upon a mark-to-market loss in the tail of the distribution of portfolio values.

Market risk management and calculation of a market risk capital requirement proceeds on the assumption that there is no counterparty credit risk, and as such assumes that losses (and gains) from derivatives stem solely from buying and selling the claim in the market – i.e. from price moves. This assumption rests upon and contributes to the increasing appearance of derivatives as tradable, an appearance which not only reflects market participants' increased trading but is also built upon a number of concrete back-office practices to support this appearance.

First, it is made possible by the accounting treatment of derivatives. On the one hand, the value of the claims included in the VaR calculation was marked-to-market, so the balance sheet already reflected losses (and gains) from falls (and rises) in the replacement value of a book of derivative claims. Both this marking to market and the VaR calculation were in turn made possible by financial accounting treatment of counterparty credit risk: first, reserving for expected loss, and second, because counterparty credit risk had already been brought onto the balance sheet via the capital requirement of Basel I for derivative counterparty risk.

[188] In addition, in 1995 the failure of Baring Brothers (Leeson and Whitley, 1996) brought attention to banks' risk control processes and departments.

Second, and as I explore in the next chapter, changes in legal documentation also support the appearance and treatment of derivatives as tradable claims. At the level of individual contracts, these changes have tended to standardise derivative instruments. As a result, a derivative claim on a counterparty that buys the underlying index becomes a closer match to one that sells the underlying index. This makes it easier for market-risk practices to treat them as the buying and selling of the claim. At the level of portfolios of claims between two counterparts, portfolios are legally valued at their replacement value, thus assuming that the claims can be bought and sold. Finally, the new documentation allowed for collateralisation which, like counterparty risk reserving and capital treatment, reduces the risk of loss from counterparty default and therefore further allows market-risk calculations as if claims were themselves tradable and not dependent on payment by the counterpart.

As shown, the measures required to make derivatives appear tradable require considerable institutional support; this support however mainly grows out of banks' requirements to support ever-larger volumes of derivatives trading, e.g. through the division of labour within the dealer firm, the automation of certain tasks, collateralisation and so on. With this increase in the back office functions of dealers there is an increased chance of mistakes being made and banks making losses as a result. In this light, the capital requirement for operational risk introduced with Basel II can be seen as a part of the same process of transforming derivatives from claims to tradable instruments (BIS, 2006).

As derivative trading volumes continued to grow, banks raced to bring out new instruments and to increase volumes in existing instruments, often without the necessary controls in place. Operational risk covers a wide variety of areas from delays in finalising legal documentation to not sending cash payments in time and fraud. The risk to banks from operational lapses was most famously demonstrated by the collapse of Baring Brothers in 1995 attributed to the actions of Nick Leeson, a 'rogue trader' (Leeson and Whitley, 1996).[189] These incidents continue

[189] Leeson appeared to be a successful trader, but he was accumulating losses in a 'hidden "error" account that he managed.' The losses were eventually large enough to bring down Barings. The control problem was that 'Leeson was responsible both for trading and for … the back office … He was able to disguise transactions and report them to the head office' (Smith and Walter, 1997).

with predicable regularity; the 'fat fingers trades' that regularly sent markets into a temporary spin a few years ago (Barker et al., 2005) have been upgraded to their modern counterpart the 'flash crash' caused by rogue algorithms in computer-based high frequency trading (Easley et al., 2010). An operational risk capital requirement brings these risks onto the balance sheet, constraining bank behaviour through the capital requirement, and advertising to potential liability holders that banks are managing this risk of loss and mitigating it with additional capital.[190]

The other change to derivatives in Basel II was a change in the calculation of the capital requirement for counterparty credit risk. For the largest dealers, Basel II replaced the replacement value plus add-on methodology to allow a more sophisticated modelling of credit exposure. The new methodology simulates moves in the value of the entire portfolio of trades facing each counterpart for the first year of the trade (Zhu and Pykhtin, 2007). In comparison to Basel I, the assumption of tradability is expanded by modelling each counterparty portfolio as a whole, including correlations between risk factors. Basel II assumes that in the event of counterparty default the entire portfolio facing each defaulted counterpart will simply be replaced in the market.[191] Derivatives here are buyable and sellable claims. Those derivatives facing a defaulted counterpart can simply be replaced by buying some more.

I have shown above how the various Accords have built up to the idea of a derivative as a tradable claim. For the credit risk capital requirement, the claim is valued at its market replacement value; meanwhile the market risk requirement proceeds as if there is no counterparty at all, and operational risk management bolsters the infrastructure that makes the appearance of the tradable claim possible. The inclusion of the CVA in Basel 3 marks a qualitative step on from here (BIS, 2010, revised June 2011). CVA incorporates counterparty credit risk in the valuation of the instrument (i.e. the derivative claim). While a derivative

[190] Regulators have been involved in the past in attempting to fix and forestall problems from such issues, notably the Federal Reserve of New York coordinated banks in 2005 to fix a potentially dangerous backlog of unconfirmed CDS novations (Mengle, 2007: 28-31).

[191] In practice, portfolios are calculated at the level of a 'netting set'. When, for example, trades between counterparts are documented under more than one ISDA Master Agreement this means that there would be more than one portfolio per counterpart. In the majority of cases, however, all or most exposure is contained under a single netting agreement.

claim is valued at its market replacement value, a reserve is taken in the accounts for expected losses from counterparty credit risk. CVA increasingly moves that reserve to a mark-to-market basis. The result of including the risk of mark-to-market losses in the reserve (as well as previously on the claim itself) is that the derivative claim as a whole is treated as a (counterparty) credit-contingent claim which can be bought and sold to a monetary payment determined by the moves in the underlying price index. In some respects it combines the earlier categories of counterparty credit and market risk.

The practice of marking CVA to market led to and stemmed from more active hedging of mark-to-market counterparty credit risk as firms first tried to reflect the cost of bespoke hedges in their accounts and secondly, tried to hedge the resulting mark-to-market volatility. Inclusion in the Accord further formalises and spreads the adoption of mark-to-market CVA practices, and with it the market for instruments to hedge CVA. This process has moved rapidly; in 2000 CVA desks were almost non-existent, but now they are an integral part of the trading operations of major banks and have turned from a defensive or hedging activity to activity that is expected to earn a trading profit – a powerful example of the way in which new trading businesses develop for dealer banks in derivatives markets.

Finally, more recently and, as discussed more extensively in the next chapter, the central clearing of derivatives insisted upon by regulators and lawmakers in the wake of the crisis that began in 2007/8 has further, and dramatically, increased the appearance and ability of market participants to treat derivatives not as claims on a counterpart but as a universally acceptable and exchangeable claim.

The economic incentives and practices of dealers lie at the heart of this treatment of derivatives as tradable. Derivatives dealers profit from issuing derivative claims to buy and sell at a bid-ask spread (see Chapter 5), to capture more profit in this way each dealer is continuously incentivised to increase the quantity of derivatives they trade. As a result they put into place procedures and practices to manage the resulting portfolios and trading operations. Although national central banks and bank regulators sitting on the BCBS might not claim or aim to represent banks' interests directly, they cannot help but be influenced by banks'

existing practices. As a result, practices for managing these ever-increasing quantities find their way into banking regulation.

This serves dealers as a group in two ways. First, it constrains the amount of leverage that they can take with respect to these risks, and in doing so provides a solution to the ongoing bank problem of competing themselves into over-leverage and default. Second, and related to the first, it provides a means of signalling to the holders of bank liabilities that those liabilities are safe. The Basel Accords are understood here as a mechanism that helps banks to extend derivatives markets; this is quite different from their usual portrayal, which argues that they merely 'deal with the … consequences of this extension' (Underhill, 1991: 215).

Banks as derivatives market makers profit by collecting bid-ask spread. This creates the incentive for them to trade more and to increase the tradability of derivatives to achieve this. They develop practices that make derivatives more tradable, including those embodied in the Basel Accords and, as later chapters explore, in risk management and contractual practices. As these practices become established they become indispensable to the continued operation of derivatives markets, especially in their support of the ever-larger volumes being traded. In doing so they take on a certain objectivity and in turn affect the development of new practices. In this way the process of growth and development continues.[192] Since the escape of OTC derivatives from the constraints of the CEA as bespoke private agreements, market participants have increasingly been able to act as if derivatives are themselves tradable rather than an untradable claim against a market-making bank.

In this way the banks' incentives to treat derivatives as tradable claims, incentives that stem from profit motvies, are realised through their practice; the appearance of derivatives is transformed and market participants can increasingly act as if derivatives are, after all, tradable claims.

[192] As Chapter 8 explores in more detail by looking at the use of valuation models and risk management, the approach outlined here differs from Mackenzie's (2003, 2006) use of performativity. Performativity (and counter-performativity) might be thought to arrange analysis in a different way, concentrating on the last of these stages and asking (only) how ideas such as valuation theory come to affect the development of new practices.

Crisis, however, has a way of disabusing the assumptions that have led to this construction of derivatives as tradable instruments. In particular, the crisis that began in 2007/8 illustrates how the various dimensions of risk in derivatives, to a large degree assumed separable in the Basel modelling, are very definitely interconnected. In 2008/9 large mark-to-market losses on portfolios price disruptions were associated with counterparty credit events, further price disruptions and dramatic falls in liquidity which further undermined the assumptions of both counterparty and market risk modelling. Furthermore, operational risk is intertwined with these other risks; e.g. dealers' failure to collect sufficient collateral from AIG, Lehmans and other defaulting counterparts led to larger losses than risk management systems were predicting and to systemic risk. The total collapse of the residential mortgage market illustrates how, without ongoing trading, derivatives become claims on counterparties, and the risk management that sustains their appearance as tradable claims becomes useless to banks and therefore meaningless.

The financial crisis that began in 2007/8 also revealed how bank practices continue to develop, often in ways that seek to operate outside the constraining framework of existing regulation. As discussed, the Basel Accords attempted to reflect bank activity on the balance sheet. The crisis revealed the many ways in which, in reaction to those regulations, banks had been attempting to seek activities and profit outside their framework by undertaking off-balance-sheet activities, e.g. collateralised debt obligations and structured investment vehicles (Duffie, 2010). Banks moved assets into seemingly separate entities, thus those assets did not incur a capital requirement on their own balance sheets under banking laws. However, the crisis revealed that the majority of these activities were not capable of standing alone, and many came rapidly back onto bank balance sheets as a result.

6.4 **Conclusion**

This chapter has highlighted how the evolving role of banks and their emergence as derivatives dealers are bound up with changing banking regulations. It has shown how derivatives markets, dominated by banks' trading financial derivatives emerged from the changing economic, financial and regulatory

landscape of the mid-20th century: first, as banks sought new profit opportunities outside existing regulatory structures with liberalisation often following as regulation sought to re-encompass these activities and; second, how re-regulation facilitated these new activities by mediating the relation between banks and the holders of their liabilities in the wider economy.

In some ways, however, the changes, particularly those that have occurred since the crisis, are bringing OTC derivatives full circle to the form of exchange-traded derivatives from which they escaped in the 1980s. First, credit risk, market risk and operational risk are now included once again in the regulatory environment; and second, while capital requirements are being boosted by the regulatory response to the crisis, perhaps the biggest operational issue will be a move to central clearing for a large volume of OTC derivatives (Duffie et al., 2010, Duffie and Zhu, 2011). The OTC markets that emerge will resemble ETD derivatives in many ways, but with vital differences to the ETD derivatives of the New Deal regime.

The regulatory logic throughout the OTC era has led to increases in the volume of derivatives and to a change in the character of derivatives from bespoke, bilateral claims to standardised and tradable claims. In many ways the return to exchanges can complete this transition: thanks to centralised credit enhancement mechanisms such as daily cash margining, derivatives on exchanges become devoid of counterparty risk and simply become ‘things’ to buy and sell; moreover other restrictions on the growth of the market such as operational risk are also largely dispensed with.[193]

Whether the changes in OTC derivatives markets, such as the move to central clearing, will be advantageous to banks or represent a return to the suppression of their activities remains to be seen. New Deal regulation was able to suppress derivative activity to a large degree because it had derivatives corralled on exchanges. However, that regime was national and legislative, and was aimed at suppressing the speculative elements of finance. Partly as a result of the reaction to this regime, the Basel regime whcih replaced it is quite different. It is

[193] In a direct parallel clearing houses play a critical role in the transition of bank credit money from claims on individual banks to fungible, commodified, claims acceptable by all as money.

international, run by specialist agencies focusing on banks, and appears to have no problem with the continued growth and trading character of derivatives markets. Insistence on corralling derivatives activity through central clearing offers an opportunity to alter derivatives markets for those who feel that derivatives markets are not serving broader society, a group which has grown since the financial crisis that began in 2007/8 (Turner et al., 2009). Whether this opportunity will be taken up remains to be seen, for central clearing also offers the opportunity to trade yet more derivatives.

7 Contracts and clearing: managing volume and the derivative contradiction

7.1 Introduction

The central contradiction of derivatives markets for this chapter and the next is that the derivative form is a bilateral untraded agreement between two parties that exists to allow market participants to trade in an underlying which itself cannot be bought or sold, as it is merely an index, a measurement which determines the payments into the derivative. A cash-settled derivative is therefore an untraded claim to allow trading (see Chapter 5). The analysis arrives at this contradiction through examining the evolution of banking, the emergence of institutional investors and the shift in the character of financial markets from a means of providing credit to a site for trading. This contradiction provides, from within the analysis of the development of the derivative form itself, constraints to the growth of derivatives markets. The analysis continues in light of this contradiction by examining the evolving practices of banks as derivatives dealers, led by their profit motives, and in particular the ways in which they strive to increase derivative trading volumes and how derivative claims themselves come to appear tradable to market participants as a result.

Contemporary derivatives markets are dominated by high-speed incessant trading by dealers and other, non-dealer financial institutions. Understanding how this situation came about is impossible without understanding how derivatives claims come to appear tradable. One of the critical elements of the practices that have made this possible has been the form of the legal contracts that constitute derivatives and, on a multilateral basis, clearing practices that are closely related to bilateral contractual practices. As a result, analysis of the nature and development of the legal contracts governing derivatives since the late 1980s is an important part of understanding the growth and changing character of derivatives.

The contract governing OTC derivatives was central to them escaping the regulation put in place in the 1930s, which effectively suppressed derivative

activity and limited it to derivative exchanges (see Chapter 6). OTC derivatives escaped these constraints as tailored, bespoke contracts between eligible parties and not the standardised contracts found on exchanges. Fears for the validity of derivatives contracts in the face of a rising amount of OTC derivatives outstanding prompted the gradual strengthening of their exemption of OTC derivatives from the constraints of the Commodities Exchange Act (1936). They also motivated the actions of the International Swaps & Derivatives Association (ISDA), which has long been at the centre of shaping the OTC derivatives markets from the perspective of the legal contract.

However, changes in the form of OTC contracts since the late 1980s represent a return to the form of exchange-traded derivatives in two ways: first, there has been a tendency to standardise derivatives contracts, and second, there has been a growth of netting, collateralisation and more recently, central clearing for OTC derivatives. The motivation for these developments can be found in the profit motives of dealers – the market makers in several senses – for whom profit is gained from a bid-ask spread on derivative prices, and for whom increased trading activity (other things being equal) means increased profits. The formalisation of agreements both within the dealer firm and between all firms in the market is both shaped by and encourages further growth in derivatives markets and in turn comes to affect the character of derivatives markets. [194]

Section 7.2 places contracts in the context of the extraordinary growth of derivatives markets which provides dealers with growing market-making profits and requires more coordination than small markets would. Section 7.3 analyses the confirmation, which is the contract governing a single trade. [195] As derivatives are instruments that are traded by pilling up claims and

[194] Making derivatives markets requires the coordination of those who participate in it, both within and between firms. The practices involved in coordinating participants become entrenched and give rise to arrangements such as contracts, which take on an objectivity and in turn impose themselves on future developments (Ilyenkov, 1977, 2013, Pilling, 1980). This approach can be contrasted with the approaches to the analysis of regulation and risk management/valuation models, such as performativity, which arrange the analysis to examine the effect of arrangements such as contracts or valuation models on practices.

[195] The confirmation, so called because the back office uses them to confirm the trader's agreement, is the basic legal document governing single derivative contracts and specify the terms of the trade such as the reference index, the expiry date and so on.

counterclaims, section 7.4 examines the role of the agreements between parties covering portfolios of claims first bilaterally and then multilaterally. Section 7.5 concludes.

7.2 **Contracts and the growing business of derivatives market makers**

Legal contracts in derivatives markets are one of the most direct and observable manifestations of the forces that shape these markets. Their form emerges from the practices of market participants, but above all from banks as derivatives market makers. Of all the participants in the market, market makers are most interested in increasing the total volume of derivative contracts that are traded. Practices to support increasing volumes find their way into formal expression in derivative contracts, which become central to the continued working of the markets and affect its future development.

This section begins to trace the ways in which these processes occur. Broadly, the analysis moves from informal agreements that might allow very small derivatives market to function to the ways in which new devices – here, contracts – emerge in response to and at the same time facilitate the growth of the market. This paves the way for the later analysis of how these formal agreements further increase the scale and scope of the markets.

7.2.1 Contracts: central to performing derivatives

Informal agreements regarding derivatives transactions could only support a very small derivatives market. To a large extent it is formal, written legal contracts that allow derivatives markets to grow. Put another way, contracts provide the framework within which trading occurs on the scale that it does, and such a framework could not be provided by ‘gentleman’s agreements’ between traders.

The conduct of relatively small groups of derivatives traders, e.g. in a single trading pit or market, or even on a given exchange, functions by codes of behaviour that are more complex than those strictly prescribed by the rules and certainly more than those posed by the hypothetical *homo economicus* of mainstream economics (MacKenzie, 2006). This social code can, to a limited

extent, resolve disputes about the details of completed trades and to an even more limited degree could support the settlement of such trades. However, as derivatives trading expands in scale from a few thousand up to millions of trades a day, more formality is required.[196]

Processing even a moderate quantity of trades requires specialisation such that once the trader has struck the deal a large middle and back-office staff are required to ensure that the payments agreed upon in the deal are processed.[197] The contract helps with this in two ways. First, the system can only function by formalising the terms of the trades. Second, such a large group cannot support the diffusion of trust and reciprocity on which the smaller group relies for informal dispute resolution. I now explore these two elements in more detail.

First, formal contracts help to organise activity on a large scale. It might seem that the two traders striking a deal over the telephone or in an exchange pit are 'performative' in the sense that 'the issuance of the utterance is the performing of the action' (Austin, 1962: 6), or that the utterance 'brings into being that of which it speaks' (MacKenzie, 2004: 305); i.e. when traders announce the deal 'done!'. However it can equally be argued that the derivative is not performed until all the payments are made and any other terms fulfilled – in short, without the back office nothing would actually happen when two traders agree that the derivative transaction is 'done'. Even a moderate scale of derivatives activity demands several specialist groups to complete the performance.

While 'derivatives trades are initiated in the front office trading function, [they are] then cleared, managed and settled in the middle and back office functions.' (Schinasi et al., 2000: 20):

> The back office provides five critical functions: issuing and monitoring confirmations; recording transactions; settling transactions; ensuring that legal documentation is completed; and

[196] It might be even argued that the informal behaviour observed occurs within the framework of a large-scale trading environment made possible by the formal economic structure, not least property rights. In this case the informal codes that appear to be at work in small groups of traders cannot be analysed separately from the more formalised aspects of a trading floor.

[197] Even on the trading floor itself, there is a division of duties and a definite hierarchy, with heads of desks and dealing rooms at the top earning huge salaries and relying on many more junior employees to undertake the individual tasks of derivatives trading (Godechot, 2008).

> producing information for management and control purposes, including reports on positions that are subject to trading and counterparty limits, reports on profitability, and reports on positions that require action…' (Schinasi et al., 2000: 21)

Typically there are many more employees supporting traders, than there are traders. Analysis of the whole of this arrangement for performing derivatives gives a broader insight into the rise of derivatives in the last 30 years than would be possible if concentrating only on trading floors.[198]

Given the enormous resources required to make the market operate on the scale that it does, translating the deal into 'legalese' is critical to the performance of the derivative;

> [Legal contracts render] the innovations of the market, expressed in the Esperanto of the trading floor, into legal documentation that both ensures the correct application of the appropriate legal concepts and that the contractual intentions of the parties reproduces in written form. (Hudson, 2002)

The legal contract, embodied at the lowest level in the confirmation, provides the definition of the trade that enables the machinery of middle and back office to operate, both coordinating specialists within firms and coordinating across firms.

In addition, once the derivatives market is operating on a lage scale in terms of both the number of trades and the number of employees the law is required to mediate in disputes between firms, replacing more informal mechanisms that might work in smaller situations. Traders might agree the terms of the trade between themselves but scale requires formality, not least when elements of the performance of the derivative, such as ensuring that payments are made, involve many other people besides the traders; and this formality, in turn, requires written specification of much more detail than traders would ordinarily specify

[198] Methodologically, focusing only on trading floors, important as they are, risks becoming ideal as the analysis focuses not on the whole phenomena under investigation but a preselected part using unspecified theory (see Chapter 2).

between themselves. There are two aspects to this: first, the terms require detailed specification to ensure that all payments are correctly processed, e.g. payment dates, payment currency and which publication provides the reference price, and moreover for some instruments, specifying the conditions in writing involves considerable complexity. Second, the parties' behaviour in the event of unforeseen circumstances (not least the default of one of the parties) must be addressed in the contract.

In short, the legal confirmation can be thought of as a manifestation of practices that to a large extent grow from the need to support derivatives trading on a large scale. Large-scale trading mainly stems from the profit motives of the dealers, who are also the group with the most say in the development of legal documentation of OTC derivatives. For further detail of how these practices impact on the development of derivatives markets, the next section explores how the confirmation has developed since the explosion of OTC derivatives that began in the late 1980s.

7.3 The production of a virtual underlying asset and the standardisation of the derivative contract

A derivative contract must establish two major elements: the price index that the derivative references and the terms of the derivative itself. Because cash-settled derivatives do not involve any exchange of an underlying asset or commodity, the first task facing a derivative dealer striking a new derivative is to define which reference index will be used. This index needs to appear objective to both parties, e.g. it cannot be one over which one party can exert control. Legal academics might describe this as an aleatory contract.[199] This section first examines the 'production of virtuality' (MacKenzie, 2007) that dealers must undertake to establish an underlying price index.

[199] Lynch (2011a: 10) describes derivatives as aleatory. An aleatory contract is a 'contract in which one party's duty of performance depends on some uncertain event, e.g. a wagering contract, a contract of insurance' (Richards and Curzon, 2011) or more simply as 'a wagering contract.' (Osborn and Woodley, 2005) Lynch stresses that in derivatives and in aleatory contracts duty of performance depends on an uncertain event external to the counterparts and not on their performance.

This need to separate the making of the index from both parties, or to establish its 'facticity' (MacKenzie, 2006) contains the seed of the standardisation of the index and of the derivatives contract. The second part of this section turns to the standardisation of derivative contracts which has typified OTC derivatives ever since the market escaped New Deal era regulation in the late 1980s, an escape made on the basis of being non-standardised. (Greenberger, 2010) Once again standardisation is associated with growth in derivatives markets and with a change in their character.

7.3.1 The reference price index underlying the derivative and the production of virtuality

Cash-settled derivatives proceed *as if* an underlying commodity-like exchange occurs: they appear to represent the net cash payment that would occur if an underlying purchase and sale have been completed. As happens so often, though, appearance is the inverse of reality, for cash settlement actually ensures that no underlying exchange occurs – only cash is delivered and no commodity, security or any other asset is involved. A cash-settled derivative simulates an M-C-M' exchange; i.e. the participants act as if, starting with money, a purchase and a sale will result in a return to money with a loss or a gain. In fact cash settlement ensures no exchange of money for commodity (M-C), or commodity for money (C-M) takes place and instead there is on a single money payment between derivative counterparts equal to ΔM, the difference between M and M'.

'When something comes to exist "in practice", but not in reality in the strict sense, it can be said to be *virtual*' (Arnoldi, 2004: 24). In this sense derivatives dealers must invest in the 'the material production of virtuality' (MacKenzie, 2007); they must bring into being something to trade in practice but not in reality. Economic sociologists have explored the material ways in which the virtual nature of financial markets comes into being in general and how the virtual asset underlying the derivative is 'made' in particular. Banknotes, debased coins and even entries in electronic databases are material, but their materiality is indirectly linked to their ability to serve as money.

Similarly, although not money, the material production of virtuality in derivatives markets has numerous physical manifestations. Examples include, but are not limited to, the banks of computer screens and the software they display (Knorr-Cetina, 2005, Knorr-Cetina and Bruegger, 2002, Pryke, 2007), the organisation of trading floors (Beunza and Stark, 2004) and the processes of risk management and credit assessment, e.g. visiting other financial institutions with which derivatives might be traded (Kalthoff, 2005).

With exchange of an underlying asset entirely missing, cash-settled derivatives counterparts require simply a change in the price at which the virtual exchanges occur. This is provided by a measurement or index, and it is this price index that is the underlying to the derivative. Herein lies the fundamental separation between trading the real underlying asset and trading with a derivative: in the former an asset or commodity is exchanged for money, in the second the underlying a measurement and it is impossible to actually exchange a measurement, it is only possible to trade derivatives on it.

This is most evident in the most developed forms of derivatives, such as weather derivatives for which delivery of an underlying asset is simply impossible (there is no asset in this case), but armed with knowledge of these forms it is possible to go back and see that the same is true in earlier forms. The analysis below moves from physically-settled derivatives to financial derivatives on an existing single security, to derivatives on a pool of securities and finally to derivatives referencing an index where no underlying asset even exists and certainly cannot be traded e.g. LIBOR-based or weather derivatives.

Starting once again with the physically-settled derivatives that pre-date the explosion of financial and OTC derivatives in the 1980s and returning to the wheat contract on the Chicago exchanges, it can be argued that social and technical processes are under way that create conditions for the emergence of the derivative (MacKenzie, 2007: 14). To a certain extent, technological advances (themselves a social process and a part of the more general development of capitalist relations) created conditions for the contract. In particular, the use of the railways and grain elevators pooled the grain of several farmers while transporting it to market, making it impossible for a buyer to say

exactly where or from which farmer the purchased grain originated. In some part, more obviously social processes created conditions for the contract: inspectors from the Chicago Board of Trade assessed the quality and the fairness of the weights and measures used, and in time the State of Illinois took up the role of independent assessor of the grain (MacKenzie, 2007).

Buyers no longer bought and inspected *the* specific grain of a certain farmer for themselves – now they bought *an* amount of *a* standardised produce to be delivered from the pooled grain stores. Based on pooling and inspecting practices, confidence in the quality and quantity of the grain to be eventually delivered into the derivative contract allowed derivatives trading on produce that not only could not be physically inspected by the buyer at the time of the transaction but might not have even been planted at the time of trading (MacKenzie, 2006). The underlying asset can be characterised not as actual grain but as an 'homogenous abstraction' (Cronon, 1991: 132, quoted in MacKenzie, 2006: 14) to a standardised quantity of a standardised quality of grain that can be traded in practice but not in reality, i.e. it is only traded virtually.

Traders must come together in financial and OTC markets, too, to define a common underlying reference price index to trade. As with commodity derivatives, the creation of the underlying reference price index requires 'facticity' (MacKenzie, 2006), i.e. to be accepted as fact. To do so the underlying reference price index must be measureable and representative of the thing it purports to trade virtually, i.e. 'in practice', and both counterparts must believe that it is free of manipulation. This facticity can be achieved by invoking groups in society beyond the dealers themselves, as seen above with the introduction of the State of Illinois.[200] Market makers in derivatives markets have often found ways to create the underlying reference price index themselves, e.g. in LIBOR-based derivatives.

[200] The state can play various roles in helping to establish facticity. Occasionally it has instigated markets such as carbon and sulphur markets. More often it has ratified existing markets to boost acceptability, investigations into the probity of LIBOR might be seen as one such example. (Murphy et al., 2012)

Even financial derivatives on a single underlying asset, such as a derivative referencing a common equity, involve referencing *a* price, not *the* price of an underlying exchange. The process of compiling a reference market price from the variety of trades that might or indeed might not have occurred in a day requires rules, i.e. modelling (MacKenzie, 2006: 21-22). A variety of techniques exist for compiling a reference price, e.g. published closing prices are often not the last trade of the day and involve calculation using the prices of a variety of trades.[201] A reference price calculated from numerous transactions underlines that even when the derivative appears to be on a single asset there is a separation between the asset and the price index underlying the derivative.[202]

Consider now derivatives on pools of securities rather than on single securities, for example government bond futures and equity index derivatives. Here the reference price forming the underlying price index for the derivative is even more clearly separated from any actual exchange. For example, a critical component in pricing government bond futures is the calculation of the so-called 'cheapest to deliver security', which may not even have been issued at the time the derivative is traded (Livingston, 1987). Similarly, it is often difficult to the point of impossibility in equity index futures to simultaneously trade the underlying pool of assets. Derivatives on the S&P500 equity index are among the oldest financial derivatives of the modern derivative era and remain some of the most popular. Trading five hundred stocks in the same moment is considerably more difficult than trading in one derivative contract.

Finally, most derivatives trading is in instruments where the link to an underlying asset exchange does not exist at all. Examples include such things as weather derivatives; the most voluminous example, however, comes from derivatives on the LIBOR (Campbell and Diebol, 2003, British Bankers' Association). Now compiled by the British Bankers' Association (BBA), it serves as a reference for more OTC derivatives (measured by notional amount

[201] Indeed it can become complex, for example as a result of attempts to manipulate closing prices (Comerton-Forde and Putnins, 2011).

[202] Moreover, and as I discuss further in Chapter 8, as the construct of the reference price becomes more established an inversion occurs such that actual prices of exchange come to be seen as diversions from the modelled price. This parallels the way that the price of commodified labour comes to be measured as diversions, 'mere sources of error', from the price of abstract labour. (Lukács, 1971: 89)

outstanding) than any other set of underlying price indices (BIS, 2011). LIBOR represents the banks' estimates of where they might borrow from each other in various currencies for various maturities and need not represent actual transactions. To avoid perceptions of possible manipulation, outliers are removed and the remainder of the estimates averaged. Thus the banks collectively create the measure that they then use to trade and profit from.

CDS offer a further example: as discussed in Chapter 1 and elsewhere in this thesis, the underlying reference price for a CDS is effectively an index that equals 1 until a committee made up of dealers and other large market participants declares a default event, at which point all trading ceases and an auction among market participants sets the final index level between 0 and 1. In other words, trading only occurs when the index = 1. Derivatives on this index are the only way in which this underlying reference price can be traded, the reference price being the committee's decision and the result of the auction.[203] Again, market participants construct the index that they use to trade. *Contra* Fehle (2006: 534) it is not only in exchange–traded markets that derivatives dealers 'collude' to design the instruments.

Even when the derivative is highly complex and / or bespoke and is not intended for further trading, it must be built upon commonly-accepted facts, e.g. published interest rates or exchange rates. Indeed, once the underlying asset is not socially constructed then a specific and private loss must be proved to the other counterpart, in which case the instrument in question ceases to be a derivative and becomes insurance. Once a specific loss must be proved or delivered, the contract in question becomes unsuited to repeated trading. By being a claim referencing movements in an index, the derivative eases the counterparts' ability to act *as if* they are trading precisely because they do not have to actually exchange anything.

To recap, the underlying to a derivative is an index, a measurement constructed by the market participants. Successful derivatives markets rely on participants

[203] Trades in the bonds which make up the pool can be modelled to produce a yield curve for that class of bonds, and this can be used as a guide to CDS pricing. Usually CDS trade at a 'basis' to bonds, meaning that there is a difference between the yield curve of the bond and the CDS.

establishing the facticity of this index between them. The index cannot itself be traded; only via derivatives can participants trade *as if* they are trading the index.

7.3.2 Standardisation and tradability

The benefits to the bank of increased tradability of derivatives and the need to establish the facticity of the reference price underlying the derivative exert pressure to standardise it. As discussed, the creation of facticity involves references that are external to the two counterparts. Moreover if the counterparts wish to trade the derivative again, which after all is the purpose of trading in derivative form in the first place (see Chapter 5), then the more widely the underlying price is accepted as fact, the easier it will be to engage large numbers of counterparts in trading.[204] The nature and purpose of the derivative and the benefits to dealers of increasing trading volumes lead to a standardisation of the underlying reference price index. This standardisation affects derivatives in a number of ways that are explored below.

Standardisation affects the underlying price index and the derivatives contract itself (i.e. the contract that references the underlying price index). It manifests in the confirmation, the basic legal document governing single derivative contracts. Increasingly, standard confirmations are published by ISDA, the organization charged with coordinating legal matters in the OTC derivatives markets and dominated by the largest derivatives dealers.[205]

The most basic way in which standardisation increases tradability is almost arithmetical; it reduces the possible contracts available, and by reducing choice, creates more potential matches. If there are, say, 100 market participants and 50

[204] It should be noted that the underlying price may only have become a 'price' by being invoked in the derivative, and may have already been an socially established fact e.g. official measurements of inches of rainfall in a weather derivative.

[205] Originally called the International Swap Dealers Association. Although ISDA boasts 803 members, 209 of these are 'primary members' and in fact a smaller group appear to hold more power than others: apart from the executive vice chairman and CEO the officers and directors are overwhelmingly employed by major derivative dealers. Officers and directors are drawn from Deutsche Bank, JPMorgan Chase & Co, Morgan Stanley, BNP Paribas, UniCredit, Citi, Société Générale, Goldman, Sachs & Co, The DE Shaw Group, PIMCO, Nomura Securities, HSBC Bank plc, Standard Chartered Bank, Royal Bank of Scotland, Barclays Capital, Mitsubishi UFJ Morgan Stanley Securities, BP, Bank of America Merrill Lynch, UBS AG, BlackRock, RBC Capital Markets, and ICBC. (ISDA, 2009a)

contracts, the chances of finding offsetting trades are small; if there are only 5 possible contracts then the chances of matching trades is greatly increased. At the level of the derivative contract, if terms are limited more participants will find offsetting trades; e.g. if counterparty A wants to buy an option with a strike price 49.5 and counterparty B wants to sell an option with a strike 50.5 they more likely to trade if only one strike of 50 is offered than if three, of 49.5, 50 & 50.5, are offered. The same is true for the choice of underlying reference price index (just another contractual term in this respect): for a given number of participants, a restricted number of possible underlying reference indices will tend to increase participants per contract specification, concentrating activity.

Neoclassical economics might portray this restriction of choice as a trade-off for market participants in which they choose a suboptimal contract in order to increase tradability (Fehle, 2006, Koch and Lazarov, 2007). This assumes, however, that the market participant has a use for the contract other than trading which determines their optimal contract, the most likely of these uses being hedging. As Chapters 1 and 5 in particular have argued, however, derivatives are trading instruments designed to facilitate repeated buying and selling. In this light standardisation is not a trade-off but a sensible collusion on the part of market participants to concentrate and therefore increase the number of potential buyers and sellers in a given contract.

The second way in which standardising the underlying reference price index can increase tradability is by making it easier to generate the level of shared knowledge required to allow two parties to transact. Carruthers and Stinchombe (1999: 354) ask how ‘heterogeneous claims on income streams associated with different sorts of assets get turned into homogeneous commodities that buyers and sellers can understand’. They find that in order to transact, buyers and sellers require some level of common understanding; knowledge has to be created socially in order for buyers and sellers to be able to reach consensus on price and for reasonably stable prices to emerge. Furthermore, this knowledge is socially created and does not need to be objective. In the case of financial instruments, the widespread belief in the benefits of diversity argued for in academic work (e.g. Markowitz, 1952), leads people to believe they have

increased shared knowledge when assets are pooled, compared to when they are not – put another way generating sufficiently common beliefs to trade a pool of mortgages is easier than generating sufficiently common beliefs to trade each mortgage individually thanks to a belief in diversification. As noted in Chapter 5, trading in pools of assets is only possible and practicable with cash-settled derivatives.

Credit markets provide an example of the process of contractual standardisation that has occurred in OTC derivatives markets (see section 1.4.2). Credit markets began as bespoke agreements for banks to hedge specific exposures that were on their balance sheets without sacrificing their client relations. After a while banks expanded their activities from using credit derivatives to making markets in them. This was accompanied by and contributed to increasing quantities of derivative trading. In time a standard instrument emerged: the CDS (Mengle, 2007). Then, via ISDA, documentation for the CDS was standardised, culminating in the big and small bang protocols introducing net cash settlement (ISDA, 2009a, 2009b) By standardizing and adapting the pool of deliverable bonds over time and then defining the auction process for cash settlement, dealers have brought into being and steadily increased the tradability of a commonly-accepted reference asset. Practices which led to increased standardisation have resulted in greater tradability.

These processes of standardisation accompany a change in the character of credit derivatives from an instrument used by banks to adjust their credit portfolio without selling loans (where the primary concern was the payoff in the event of a credit event) to an instrument for making trading profits (where the primary concern is the payoff from buying and selling a tradable instrument in the market). In light of this analysis it is worth repeating the quote from the head of ISDA regarding sovereign CDS:

> Most importantly, the critics of the product have misunderstood the fundamental difference between CDS and insurance. While CDS is often referred to as insurance it is not. It is a traded financial product and thus participants can buy it and sell it any day regardless of whether a credit event is declared or not. Currently, even without a

> credit event in effect, an owner of protection can sell it and get paid … thereby monetising his gains and exiting his position … Quite unlike insurance, CDS can pay on any given day by unwinding the position. A credit event simply forces payouts on the same day. (Voldstad, 2011)

In most circumstances, however, Voldstad is wrong: it is not enough to sell protection to monetise gains. Profiting from a favourable price change involves trading an additional offsetting derivative; the profit is only monetised when both trades have run their course and the streams of coupons in the derivatives have been paid. Furthermore, if there is subsequently a default event in the reference credit the apparently successful trader is denied his profit: equal amounts of bought and sold protection are netted and terminated and the (differing) streams of coupons cease to be paid.[206] The next section investigates the legal documentation covering portfolios of derivatives, documentation which is very important in making it appear as if derivatives are themselves tradable claims, even to the head of ISDA.

7.4 Making portfolios of claims and counterclaims tradable

The analysis in this section starts once again with the contradiction of derivatives as bilateral and untraded claims that exist to facilitate trading. Buy and sell a security, and you are left simply with a monetary gain or loss; to buy and sell with a derivative, however, requires two offsetting claims, each a bilateral claim to future monetary flows from a counterpart. Repeated buying and selling operations result in growing pile of claims and counterclaims. The realisation of any trading profits in money does not happen immediately: by definition the derivative is finished when the last payment has been made, and conversely it is only live if future payments are remain to be paid. It is, as a result, subject to counterparty credit risks. The analysis starts by investigating the steps taken to mitigate this counterparty credit risk and reveals once again

[206] This can contribute to an inversion in the CDS price curve, as a reference credit is perceived to be nearing default because traders rush to buy additional, short-term protection. Traders aim to become over-hedged in case of default in order to compensate them for the loss of mark-to-market profits that have been recognised in the accounts before the stream of coupons is realised.

how they result in increased volumes and changes in the character of derivatives markets.

Legal documentation in derivatives markets allows participants to net, cancel and then accelerate the cash settlement of offsetting claims to various degrees, increasing market participants' ability to treat derivatives as tradable.[207] I begin by looking at arrangements developed on a bilateral basis – first close-out netting under the ISDA Master Agreement and secondly collateralisation – and then examine multilateral arrangements such as trade compression and central clearing. I end with the exchange-traded derivative which, by combining these elements, appears as and in effect is a tradable claim.

7.4.1 Bilateral agreements: netting, close-out and collateral under ISDA master agreements

By their own account, ISDA's crowning achievement was the creation of the Master Agreement in 1992 (ISDA, 2010a). ISDA master agreements are signed between the vast majority of OTC derivative market participants, in other words between dealers and other dealers and between dealers and almost all end-users.[208] The master agreement is designed to be the dominant agreement between two derivative counterparts; confirmations, the document governing individual transaction, are subsumed by its terms. In fact:

> The philosophy behind the International Swaps Dealers Association ('ISDA') documentation is that all of the confirmations entered into between the two parties together with their master agreement, schedule, and credit support documentation are construed as constituting one single contract.[209] (Hudson, 2002: 96-7).[210]

[207] It is possible both to novate and to terminate OTC derivative contracts. However, this is only carried out in a small minority of cases.
[208] While alternatives to ISDA documentation are used they do not vary greatly and are not very common. For the purposes of this analysis it is safe to analyse only ISDA agreements and assume no differences in the other cases.
[209] 'There are three tiers of derivatives documentation: the confirmation which documents each individual transaction; the Master Agreement which sets out the more general terms on which the parties agree to conduct all of their derivatives business; and the credit support document which provides for the collateralisation of the guarantee of payments to be made under specified transactions.' (Hudson, 2002: 92)

Default by a derivative counterparty that fails to honour the claim to money could result in losses to the non-defaulting counterparty – particularly if a profit on its trades has been recognised in the latter's accounts. The Master Agreement sets out to reduce the impact of counterparty default and is largely concerned with how the parties should behave in such a case. The two principle elements of the agreement are netting and close-out (explained below); these can be augmented by the posting of collateral under a Credit Support Annex (CSA) to the master agreement.

First, the core aim of the master agreement is to achieve netting. In the event of a default by one party, the agreement 'seek[s] to achieve netting across all payments made by all transactions between the parties' (Hudson, 2002: 96). Indeed this is the prime motivation, that 'the master agreement, together with all of the other documents entered into between the parties across all transactions, is to be read as constituting a single agreement' (ibid).[211] This prevents cherry-picking, a situation where the non-defaulting counterparty must pay in full on trades where it owes money but can only stake a claim to those where it is owed through bankruptcy proceedings. The Master Agreement ensures that an apparently offsetting pair of trades will be treated equally in the event of a counterparty default. Moreover, as I show below, it facilitates the collateralisation of the net present value (NPV) of outstanding trades.

Second, the master agreement allows the closing out of outstanding claims. Netting alone would require that payments from the solvent counterpart are on-going even in the event of failure to pay by the other counterpart. Close-out netting allows the acceleration of future payments to a single claim, calculated at the time of default as the cost of replacing the outstanding trades in the market. For example, the replacement value can be established by asking other market participants for quotes on trades equivalent to all or part of the defaulted

[210] Master agreements are another element of the relation between dealers and their counterparts that has become standardised thus easing trading and lowering dealing costs. The Master agreement comprises 'the *master agreement* (usually in a standard form); [and] the *schedule* to the master agreement which amends or particularises provisions'. (Hudson, 2002: 95)

[211] Placing the transactions under a single master agreement between companies avoids the dangers that an agreement netting freestanding trades might experience in different legal jurisdictions, e.g. if netting is contrary to the usual bankruptcy practices in one or more of these jurisdictions (Bliss and Kaufman, 2005: 5).

portfolio. This process allows the non-defaulting party to enter new derivatives trades to replicate those terminated by the default of the original counterparty. The non-defaulting party can then submit a claim for bankruptcy proceedings for the cost of those trades, upon which they would hope to recover some of their losses.[212]

The third element of the ISDA documentation is the use of collateral to further reduce the risk of loss from a counterparty default. As shown in the case of counterparty default, close-out netting results in a net claim on the defaulted counterpart by the non-defaulting counterpart (if the non-defaulting counterpart is overall owed money, known as 'in the money'). However the non-defaulting counterpart will only expect to recover a portion of the cost of replacing the defaulted portfolio. Collateralisation is used to reduce that credit exposure.

Collateralisation under the Credit Support Annex (CSA of an ISDA Master Agreement is unlike more traditional forms of securing credit against the assets of another firm, where typically the claimant might have a senior claim to a specific piece of machinery, a building or an inventory, for example.[213] Like the other documents, the CSA is subsumed by the Master Agreement and as a result, payments of collateral effectively represent a separate trade to be netted under the ISDA Master Agreement. On regular dates, usually daily, collateral must be delivered to the in-the-money counterpart by the out-of-the-money counterpart such that the total collateral amount is equal and opposite to the replacement or market value of the outstanding derivatives trades.[214] In the event of default, the receiver of collateral, typically cash or near-cash financial instruments, can use it to replace the outstanding and now defaulted-on trades in the market. The net claim on the defaulted party now amounts only to any

[212] Close-out also gives a precedent to derivatives counterparts over other claimants as the ability to accelerate and fix a claim is not usually extended to other, 'normal' creditors, for example to employees or trade creditors (Bliss and Kaufman, 2005).

[213] 'In insolvency, most collateral remains under the control of the bankruptcy trustee, at least initially. While secured creditors may have a claim on particular assets, their ability to immediately realize the value of the assets is subject to the procedural delays inherent in the bankruptcy process' (Bliss and Kaufman, 2005: 7).

[214] In practice, CSAs have 'minimum transfer amounts', 'thresholds' and rules on rounding such that the amount of collateral required rarely actually equals the agreed replacement value of the derivatives trades (ISDA, 2010c).

shortfall in collateral posted against the replacement value of the outstanding derivatives trades, and is likely to be relatively small.[215]

The fact that the majority of OTC derivative notional outstanding is collateralised in this way is not often remarked upon (ISDA, 2010c). Intra-dealer trades, which account for approximately a third of notional outstanding, are invariably collateralised, as are the majority of transactions between dealers and non-dealer financial firms, which account for approximately 50% of notional outstanding) (BIS, 2011). In particular, trades with hedge funds, generally high-volume traders, are collateralised, usually with an additional initial margin posted by the hedge funds to the dealer (ISDA, 2010c: 43).

Close-out netting and collateralisation under the ISDA Master Agreement are put in place with the aim of reducing the counterparty credit risk in derivatives – a risk which stems from the nature of the derivative as a claim on the other party for future money payments. In doing so it allows greater volume than would otherwise be possible for a given amount of credit risk (Bliss and Kaufman, 2005). Alternatively put, dealer banks' ability to make markets would be severely constrained if they needed to reserve and set aside capital on each trade individually and not on a portfolio basis.

Reliance on close-out netting and collateralisation, however, also affects the nature of the resulting derivatives. The very need for close-out netting gives lie to derivatives as tradable claims and highlights their nature as ongoing claims – even as they allow participants to act as if derivatives are themselves tradable. As long as the counterparts continue to pay into the derivatives and the two parties assume that they will receive the rest of the payments due, they can make calculations about the derivative as if the payment has already been received. Discounting the streams of payments, they can calculate as if the derivative claim itself has been bought or sold and therefore value it at a replacement or market value. In particular, two offsetting trades, i.e. a purchase and a sale on the same underlying reference price index, can be calculated *as if* a set stream of

[215] In the case of over-collateralisation the collateral would be returned in the usual collateral management process once the close-out replacement value of the derivatives trades had been agreed.

income will be paid and as a result a trading profit (or loss) is recognised *as if* the money has already been received.

Default by a derivatives counterpart is likely to leave the non-defaulting unhedged, because market participants buy and sell from a variety of counterparts. What appear to be matched purchases and sales become unmatched at the point of a single counterpart's default. The illusion of having bought and sold the claim, sustained by calculating on a net basis, is shattered.

Close-out netting aims to allow the non-defaulting counterparty to quickly replace the lost trades of a defaulted counterpart and rebalance their portfolio, thus allowing the market to continue functioning smoothly. Collateralisation in effect brings forward (accelerates) future cash settlement to today by paying OTC counterparts today for derivative flows due in the future. Collateralisation builds on netting and close-out but takes a very big step further to allow market participants to act as if outstanding derivative claims are themselves tradable: putting money into the account of the derivative holder at the end of each trading day as if they have sold the claim, only for them to buy it back the next morning for the same price.

Netted collateralised derivative exposures are not the same as buying and selling a security; they are closer to buying and selling a derivative claim. In a security transaction the full replacement value of the security is paid over on the first day and gains and losses are not realised in money until the offsetting transaction is made. In a cash-collateralised derivative the notional value is not paid over, and indeed it may be that no initial payment is made. Cash payments are made each day to reflect movements in the price of the underlying reference price index.[216] Collateralisation provides the cash today to replace derivative contracts in the event of default.[217]

Bilateral agreements, most notably the ISDA Master Agreement and the CSA, go some way towards giving derivative claims the appearance of

[216] Daily margin calls are by far the most usual margin frequency found in CSAs, although longer frequencies are possible.

[217] Alternatively it might be thought of as buying the portfolio of derivative claims at the opening bell and selling it again at the close of business every day, thus realising the replacement value of the derivative portfolio in money each day.

exchangeability, but multilateral agreements are required to achieve more general exchangeability. Derivative end-users (non-dealers) face a choice of fifteen to twenty very large international derivatives dealers plus several hundred smaller dealers (see Chapter 1), and will typically maintain open trades with more than one. The dealers themselves are likely to have dealing relations with the majority of other dealers. The overwhelming majority sign ISDA or equivalent confirmations, but this leaves the problem that buying from one party does not net with a sale to another (ISDA Master Agreements are bilateral). Indeed, it has been shown that part of the motivation for bilateral agreements is the ability to rebalance a portfolio made up of purchases from one party with sales to another in the case of a counterparty default. To achieve more general exchangeability of derivative claims, banks must coordinate netting, close-out, termination and cash settlement on a multilateral basis.[218]

7.4.2 Multilateral agreements: trade compression and derivative clearing

The clearest example of multilateral post-trade processing of derivative claims occurs on derivatives exchanges, where derivatives almost fully take on the appearance of being exchangeable for money. However, increasingly there are initiatives in OTC markets to achieve the same ends, and I begin here with these efforts.

Although derivative counterparts can and occasionally do terminate trades on a bilateral basis, this does not occur on a meaningful or systematic scale. Recently, however, dealers have been coordinated into systematically terminating offsetting trades on a multilateral basis, principally via a private company called TriOptima, whose 'triReduce' service works in cycles, typically covering different instrument types/currency combinations:

> Each participant submits a portfolio of trades versus the other participants in the cycle, and those trades are matched to determine

[218] There is a clear parallel between derivatives as claims on a bank and private bank credit money as claims on banks. On the one hand bank credit money does not become generally exchangeable until multilateral arrangements are put in place, above all clearing. The similarity with derivatives is strong, however derivatives are not money, most fundamentally because their very *raison d'etre* is to have a moving money price, while money cannot have a price as the numerator in the price relation.

> the [offsetting] trades eligible for compression … Once all participants have accepted the Unwind Proposal, the transactions are legally terminated. (TriOptima, 2012a)

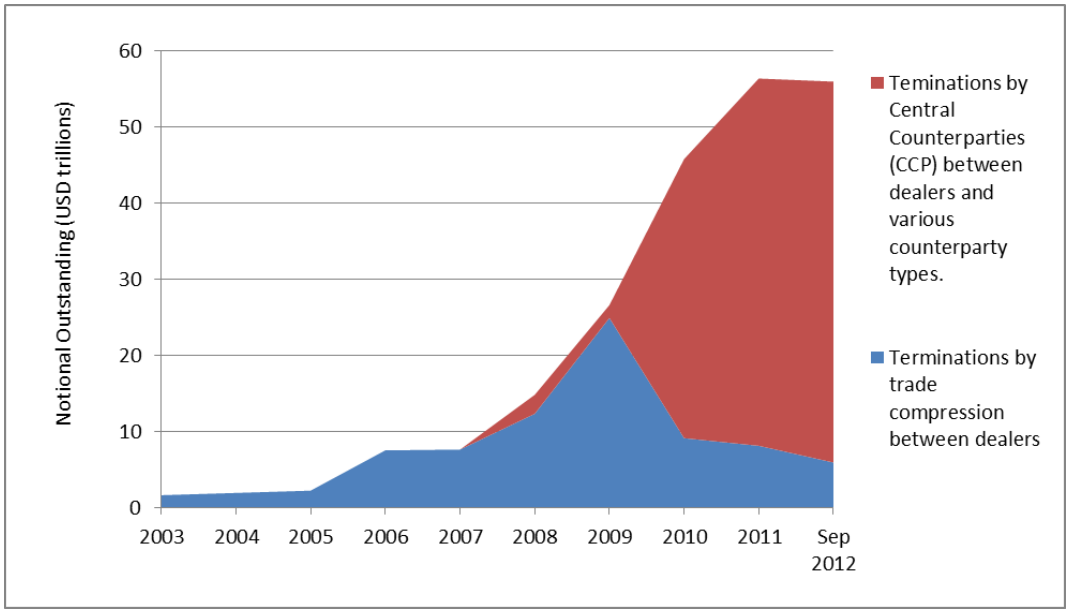
In this way a purchase and a sale via a derivative on an underlying price index, even with different counterparts, can be terminated and settled with cash. In other words, for an offsetting purchase and sale, even with different counterparts, the derivative claim has in effect become a tradable one and not a bilateral claim against a counterparty. Trade compression as this process is known, is only open to the largest players in the market, however.

In 2009 the amounts of transactions undergoing trade compression fell (see figure 7.1 below), since then an increasing number of OTC derivative transactions are being cleared centrally. In this process OTC derivatives in standardised instruments between a majority of OTC counterparts, dealers and non-dealers (not just major dealers as with trade compression), are regularly submitted to a central clearer. The clearing house steps between the two original counterparts and splits the trade into two, novating each of the new trades such that each original counterpart now faces the central clearer. Each counterparties' relationship with the clearer is collateralised, and furthermore, as with exchange-traded derivatives, this greatly facilitates the termination of offsetting trades. As shown above, both measures increase the appearance of the claim as tradable or, more importantly, the ability of market participants to treat the claim as tradable. Central clearing extends this benefit not just to bilateral relations with ISDA documentation and dealers with trade compression but also to the market generally.

The quantity of OTC derivatives affected by these measures has increased significantly in recent years. Figure 7.1, below, shows how the total notional outstanding either compressed or cleared for interest rate swaps has grown since 2003 and the shift from compression to central clearing since the regulatory changes following the financial crisis. What is, of course, impossible to determine is the effect on gross volumes of the ability to compress and clear, the most likely presumption being that it has increased the volume of OTC derivatives trading by reducing the relative amount of counterparty credit risk

per transaction. What is more certain is that it has increased the appearance of derivatives as tradable claims.

Figure 7.1 Coordinated terminations of Interest Rate Swaps by TriOptima's TriReduce service



Source: TriOptima, 2012b

The culmination of the logic of this analysis is exchange-traded derivatives (ETD). Although each trade is initially between any two counterparts, it is executed in the knowledge that it will be cleared. As described above, trades are novated to face the exchange, which is acting as clearer; they are subject to close-out and netting provisions, offsetting trades are terminated and the whole relation is cash-collateralised. As a result, not only is credit risk reduced but the offsetting of purchases and sales results in a change in the money balance comparable to the change in money balances that result from buying and selling an asset in the typical M-C-M' relation. In short, derivatives on an exchange come very close to allowing market participants to act as if the derivative itself were an exchangeable, tradable claim – only the lingering, if usually remote, risk of the default of the exchange itself casts a shadow over this transformation, and thus this legal framework allows those trading derivatives to act as if they have traded the derivative claim.

A theoretical difference that appears to remain between ETD and centrally-cleared OTC derivatives is that ETD contracts are designed by the exchange, while OTC contracts are designed by the market participants themselves. However, competitive pressure to standardise OTC contracts to both increase volumes and facilitate compression and clearing substantially reduces this difference. Standardisation makes compression and clearing easier and cheaper. For example, 'standardisation is a low-cost way to increase the number of offsetting … [derivatives contracts] … by equalising more of the cash flows that they generate' (BIS, 2010a: 62). Accordingly most progress has been made in terminating offsetting OTC derivatives in the most standardised contracts such as Index-CDS (BIS, 2010a: 63).[219] This is apparent in the setup of derivatives exchanges that maximise the central clearing of highly standard contracts, and is becoming more apparent in the OTC markets, which are increasingly coming to resemble them.

7.5 **Conclusion**

The theoretical discussion of derivatives moves to a less abstract, and more concrete level when discussing derivative contracts. It does so in several ways. First, it develops an understanding of the essence of the derivative as a cash-settled untraded claim between two parties which emerges so that they can virtually trade an underlying reference price index that cannot otherwise be traded. Second, and under the pressure of the contradictions of this essence, it shows how these markets have grown and how the appearance of derivatives has changed. Banks as derivatives dealers develop practices by which to increase derivative trading volumes in search of increased market-making profits, and these practices have shaped the legal documentation and the growth of clearing in these markets. In addition to the growth in volume, such practices have changed the character of derivatives from an untraded and bespoke claim

[219] Index CDS have highly standardised terms. For example, in contrast to interest rate swaps, Index CDS have standard coupon amounts and dates (interest rate swaps set specific coupon amounts and dates with every new trade). In contrast to single-name credit instruments, Index CDS not only have standard dates and coupons but also a more standardised underlying reference price. There is considerably more scope for matching a limited number of indices than there is for matching the much more numerous single names underlying the index.

into a standardised claim which appears to be traded and indeed allows market participants to act *as if* the derivative claim itself is being traded.

The theoretical nature of banks as derivatives dealers, developed in earlier chapters, formed the basis for this more detailed examination of practices in derivatives markets in the last thirty years and the ways in which these practices have shaped the market's development. Having examined regulation in the last chapter and the derivative contract in this, the next chapter finishes the analysis of derivatives by discussing the role of valuation models and risk management.

8 Risk management and valuation theory: calculating for growth

8.1 Introduction

Derivative valuation models are theoretically and empirically ill-equipped to predict derivative prices and derivative risk management has repeatedly failed to prevent losses, not least in the financial crisis that started in 2007/8. Yet these practices remain critical and central to derivatives markets. In the face of this apparent paradox one might well query the usefulness of such inaccurate models (Millo and MacKenzie, 2009). This chapter poses Millo and MacKenzie's question in detail and argues that the apparently problematic features of the models are in fact useful and even essential to banks as dealers in derivatives markets, in particular by allowing them to increase derivative trading volumes.

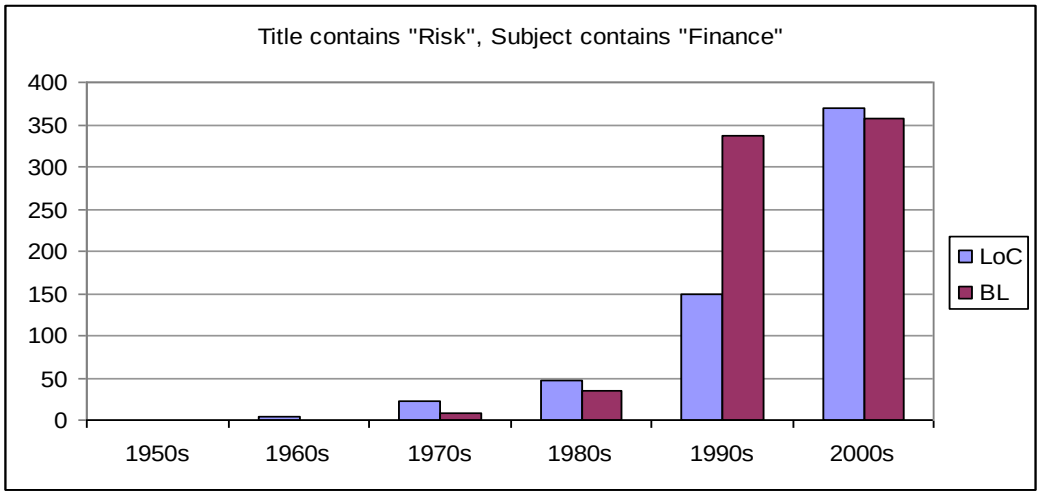
This analysis builds on the theoretical development of banks as derivatives dealers developed in earlier chapters and the nature of derivatives as cash-settled claims that have increased the scope of possible instruments and the scale of trading; elaborates on the resulting nature of derivative prices and the motivations of market participants; and enriches this analysis with an investigation of the properties of valuation models and the important insights of economic sociologists, particularly Millo and MacKenzie (2003, 2009), into the ways in which these models are used by traders.

Trading rules of thumb and trading practices pre-date the emergence of formal statistical models (Mixon, 2009). Indeed it can be argued that today's valuation models are a sanitised version of trading rules handed down in the long trading of derivatives (Haug and Taleb, 2011). Yet pointing this out only serves to show that something changed that required the formalisation of these practices, above all drawing on older statistical techniques to handle larger amounts of data (Bernstein, 1996). The growth in the scale and scope of derivatives trading,

fuelled by cash settlement and the deregulation of OTC derivatives, provides the catalyst for this change. [220]

The historical emergence of risk management coincides with the growth of derivative markets from the late 1980s onwards. A crude measure of this recent rise can be gained by counting instances of the word 'risk' in the titles of finance books in the British Library and Library of Congress. Figure 8.1, below suggests a dramatic rise in the idea of risk management in the late 1980s/early 1990s. This timing broadly coincides with the first exemption of OTC derivatives from the CEA (Greenberger, 2010), the first publication of OTC statistics by ISDA (ISDA, 2010d), reaction to the stock market crash of 1987 and the first regulatory use of the word 'derivative' (Swan, 2000: 9-10).

Figure 8.1: Instances of the word 'risk' in the British Library and Library of Congress catalogues of finance books



Source: Data accessed at British Library, Library of Congress

Valuation models and risk management practices have become increasingly important in making derivatives markets function, and in this way have

[220] A parallel can be drawn with finance theory more generally: portfolios of financial assets were traded long before Markowitz (1952) set in train modern finance theory, which today is presented as the only way to approach finance and which might be thought to principally allow the systematic trading of larger portfolios.

influenced the world that they purport to report.[221] To understand how they influence derivatives markets it is first necessary to clearly understand that they emerge because they prove useful to dealers managing large-scale derivative dealing. Put most simply, it is not possible to manage such large volumes of outstanding derivatives dealing without mathematical and statistical techniques.

Starting with an analysis of valuation models, this chapter traces a line from the features of the models that appear problematic, which are primarily their reliance on arbitrage-free pricing and simple probability distributions. Drawing on the analysis of earlier chapters, and in particular the nature of market participants trading repeatedly to capture price changes and the scope of derivative instruments made possible by cash settlement, it can be seen that the apparently problematic features of the models are in fact those that make them useful and suited to dealers' management of large trading volumes.

Moving on from valuation models, derivatives are often portrayed as allowing risk management (e.g. Froot et al., 1994), but to understand how this came about it is first necessary to understand how risk management allows derivatives. The contradiction of derivatives as untraded claims that enable trading helps to explain how valuation models and risk management help dealers to manage the pile of derivative claims and counterclaims that arise from the repeated trading of derivatives. Valuation models and risk management apply a market price to an untraded and un-tradable claim and define the terms of a new derivative to offset the risk of the existing portfolio. Doing so allows market makers to manage ever-growing portfolios of derivative claims and counterclaims as they strive to capture bid-ask spread. In this way risk management enables derivatives trading

[221] As noted above, the authors of the models seem to think that they are for pricing derivatives – in effect that they objectively report a world that they do not influence (e.g.Hull, 2009). Conversely MacKenzie makes a (qualified) case that derivative valuation models are performative, and derivatives markets come to perform derivative valuation models (MacKenzie and Millo, 2003, MacKenzie, 2006). Meanwhile Kaltoff (2005: 90) argues that 'the case of risk management shows a possible link or code switch between both perspectives: the manufacture of economic representation through practices and tools of representation shapes economic practices'. As outlined in Chapter 2 when discussing the incorporation of theory into theory, the approach here is to develop a theory of banks and derivatives that explains market makers' incentives and therefore practices that in turn illuminates both how derivatives valuation theories and models come about and how they shape future practices.

and dealing, but because it defines the next offsetting trade it appears that derivatives enable risk management.

This detailed understanding of how the models are useful explains how they become established. As volumes grow, pricing practices using models and risk management become indispensable and their use becomes entrenched. The resulting reliance on models shapes the further development of these markets, affecting both their growth and their character, and in particular derivatives, although untraded claims, come to appear tradable.[222] The result, however, is a fragile house of cards. The completed derivative remains an untraded claim, and in the event that no new derivatives are transacted, as in a crisis, it is no longer possible to assign it a price and therefore the commodity form. Valuation models and risk management become useless as derivatives revert to their basic state as untraded claims.

Section 8.2 outlines the structures of two models: that of Black and Scholes (1973) and the one-factor Gaussian copula CDO model. I point out some theoretical and empirical problems of the models and ask how these inaccurate models are useful (Millo and MacKenzie, 2009). In answer, Section 8.3 examines the nature of the prices and the motivation of participants in these markets, and the particular nature of derivatives. Section 8.4 then builds from a single trade to a portfolio, showing how the models and risk management allow dealers to build up and manage large portfolios of derivative claims and counterclaims. In doing so, derivative claims come to appear tradable, largely by taking on a price, and with it, the form of a commodity. Concluding, section 8.5 notes the fragility of this structure: large-scale trading relies on risk management, which in turn relies on large-scale trading.

[222] Ilyenkov (1977: 90) notes that '…ideal forms … have always arisen, taken shape and developed, turned into something objective, completely independent of anyone's consciousness, in the course of processes that occur not at all in the 'head', but most definitely outside it…'. Similarly Pilling (1980: 69) notes that 'the form taken by human thought … reflects man's practice' (Pilling, 1980: 69) Valuation models and risk management are the ideal form that through incorporation into practice become something objective.

8.2 Valuation models

Formalised derivative valuation models can be analysed as descendents of Black and Scholes' and Merton's pioneering papers of the early 1970s (Black and Scholes, 1973, Merton, 1973, Merton, 1974).[223] The basic structure of valuation models has not changed dramatically since, and to some extent I show this here by using both the Black-Scholes-Merton model and the standard CDO pricing model, the One-factor Gaussian copula model, to illustrate the features of the models. These two models can be seen as bracketing the modern derivative period, which broadly stretches from the introduction of cash settlement on the Chicago derivatives exchanges to the 2007/8 financial crisis.

The basic approach starts by defining the financial instrument being priced, it does so by specifying the different payments that are to be made between counterparts in different states of the world, or more precisely in different states of the underlying asset price index. These payments must then be discounted and probability-weighted. It is the choices made regarding discounting and probability distributions when using the standard models that raise questions and become the primary focus of analysis in the rest of the chapter.

In short, as I show below, the models that emerge as the standard models combine discounting and probability weighting to allow a single organisational component to emerge – volatility in the case of options and correlation in the case of CDOs – and to emphasise arbitrage-free pricing. Analysis shows that there appear to be numerous problems with the models, and yet models based on the same approach as Black & Scholes continue to be used and have grown in number and application. This suggests that there is something else useful about these models besides that which most analysis assumes for them, raising the question: What is the use of these inaccurate models? (Millo and MacKenzie, 2009).

[223] Hereafter Black-Scholes-Merton or Black & Scholes.

8.2.1 Risk-neutral pricing

Perhaps the biggest breakthrough in derivative pricing that Black & Scholes achieved was the introduction of risk-neutral pricing. Prior to Black & Scholes deciding on the discount rate for future cash flows was the largest obstacle to option pricing. Finance theory tells us that risk-averse investors require a risk premium, i.e. the discount rate should be higher than for less risk-averse or risk-neutral investors to compensate for the stochastic nature of the option value before expiry (or the risky payoff) (Pratt, 1964): '[T]he problem which had been an obstacle in the pricing of all kinds of options [was]: what risk premium should be used in the evaluation. The answer given by the Prize-Winners was: no risk premium at all!' (Royal Swedish Academy of Sciences, 1997)

Risk-neutral pricing, Black & Scholes' breakthrough, remains the standard approach for valuation: 'at its core, the process for valuing tranches of synthetic CDOs is the same as for any other asset: calculate risk-neutral expected cash flows and discount the cash flows using the risk-free rate…' (Smithson and Pearson, 2007: 92 citing John Hull).

Black & Scholes can calculate the option value with no risk premium in the option discount rate by showing first that it is possible to replicate the option payoff by trading only the underlying asset, and therefore second, that by trading the latter against the former it is possible to create a risk-free portfolio.

Black & Scholes (1973) denote the value of an option, w, as a function of the underlying asset price, x, and time, t:

$$w(x,t)$$

and the sensitivity of the option value to changes in underlying asset price (the first partial derivative with respect to x) as:

$$w_1(x,t)$$

They construct a portfolio of one unit of underlying asset and a number of sold options; the hedge ratio between the two being equal to:

$1/w_1(x,t)$

Thus the total sensitivity of the option positions to moves in the price of the underlying asset equals:

$w_1(x,t).-[1/w_1(x,t)]=-1$

In the combined portfolio, therefore, changes in the value of the underlying asset are offset by changes in the value of the options. For a given asset price at a given time, therefore, the portfolio is risk-free and so risk preferences are irrelevant: 'If risk preferences do not enter the equation, they cannot affect its solution … [allowing] … the very simple assumption that all investors are risk-neutral' (Hull, 2003: 245).

Critically, the portfolio that is constructed is only risk-free instantaneously and requires continuous rehedging. The second partial derivative of an option value with respect to asset price (sometimes called gamma), $w_{11}(x,t)$, and the first derivative with respect to time, $w_1(t,x)$, are typically non-zero. Therefore changes in the price of the underlying asset, x, and in time, t, require the rebalancing of the portfolio. In other words, as the price of the underlying asset moves so does the hedge ratio, $1/w_1$, and the hedge amount must be adjusted.

If the option is correctly priced according to the formula then the proceeds from (or costs of) of this hedging strategy are equal and opposite to the cost of (or revenue from) the option. For example, in the case of one call option versus a short position in the underlying asset, as the underlying asset price rises fresh sales are required from the short position in the underlying asset, and as it falls purchases must be made. The hedge requirements of the option therefore dictate a buy-low-sell-high policy in the underlying asset, the profits of which equate to the cost of the option, which is therefore valued with reference to the underlying asset.

The replicating portfolio or risk-neutral approach to financial valuation is now very widely, if not universally, applied in academic valuation models and is generally thought of as descending from Black & Scholes; it marks a key moment in academic discourse on financial instrument valuation: 'most everything that

has been developed in modern finance since 1973 is but a footnote on the BSM' (N. Taleb, quoted in MacKenzie and Millo, 2003: 109).

Risk-neutrality introduces a neat technical solution to the problem of providing a single valuation, but immediately gives rise to a number of problems concerning the nature of derivatives and the ability to rehedge. The first is that the replicating portfolio approach throws up the question: if the option, or more generally the derivative payoff, can be replicated with the underlying asset, what is the purpose or point of the derivative? Mainstream economics argues that the derivative helps to complete markets by allowing individuals with different risk preferences to share risk (Ross, 1976). This clearly contradicts the assumptions required to make the Black & Scholes model work. Derivatives must be different from trading the underlying asset in this argument: if markets in the underlying asset are as perfect as Black & Scholes require them to be then there is no need for derivatives e.g. as cheaper than trading primitive securities (Ross, 1976). Put another way, if everyone is or can act as if they are risk-neutral, why would they need to share risk? On the one hand, then, assuming that the underlying asset is perfectly tradable leaves no room for the justification of derivatives.

On the other hand, as shown elsewhere in this thesis it is impossible to trade the underlying price index to a cash-settled derivative; this provides theoretical space for derivatives but poses significant problems for risk-neutral pricing. The pay-out and therefore the price of a derivative is derived from a standardised measurement created by market participants – the underlying reference price index (see Chapters 5 and 7). The measurement itself cannot be bought and sold; only the derivatives that reference it can. This line of reasoning provides a justification for the derivative: *in extremis* the derivative exists in order to trade something that cannot otherwise be traded. At the same time this also provides problems for Black & Scholes' critical assumptions, as the replicating portfolio cannot be constructed.[224]

[224] This approach does leave room for Black-Scholes providing an arbitrage relation between futures or forwards and options on the same price index

Even skipping these theoretical problems, the assumption that the option can be continuously hedged is both critical to the valuation produced and unlikely to be met. As shown earlier, the portfolio requires continuous re-hedging as the profits (or losses) from re-hedging offset the cost (or revenue) of the option. If re-hedging is not possible, there is no reason the option value should calculable from the underlying assets. Assuming for the moment that instruments can be found to trade the underlying, the liquidity requirement for this instrument is still likely to be too high. Even if liquidity is available for most of the life of the option, if hedging fails for one moment there is a possibility of large losses on the supposedly risk-free portfolio (Haug and Taleb, 2011). Infinite liquidity and zero transaction costs are assumed, and these are not weak assumptions in the search for parsimony but are critical to the validity of the formula.

In short, risk-neutral pricing is both critical to the model's outcome and theoretically incoherent, and its critical assumption is extremely unlikely to be met in practice. Risk-neutral pricing has nevertheless become the central plank of the vast academic literature on derivative valuation and the centrepiece of practitioners' risk management practices. Before exploring this conundrum further it is necessary to turn to the second element of pricing models: the choice of probability distribution.

8.2.2 Probability distributions

When Black & Scholes turn to the probability distribution describing the process of the reference price, the first step is a move from discrete to continuous distribution. This has the effect of moving the rehedging requirement described above from periodic to instantaneous rehedging, rendering the assumption still more onerous. On the other hand, the choice of a continuous distribution opens the way for the elegance of stochastic calculus.

The model assumes a lognormal distribution for the underlying asset, and this choice is critical in rendering the equation as tractable and elegant as it is. Because the normal and lognormal distributions can be described with just the

first two moments of the distribution, the famous Black and Scholes (1973: 643) differential equation,

$$w_2 = rw - rxw_1 - ½\ v^2x^2w_{11}$$

need go no further than the second derivative. If a different distribution were used, the formula would need to continue with extra terms, e.g. $1/3\ v^3x^3w_{111}$ and so on (where v^2 is the variance on the underlying asset). This would quickly complicate both the calculation of the formula and the understanding to be gleaned from the outputs. As it is, the variance, or volatility, is isolated as a key unknown.

If the Black & Scholes option model opened the modern derivatives era, the standard CDO pricing model is the latest big contribution. Over thirty years since Black & Scholes was published, the two models share the same basic structure. The standard one-factor or Gaussian copula model, developed mainly from a paper by Li (2000), is the market's standard model for pricing and communication. More complex models exist and are used (see below for some examples), but the family of models is best understood by reference to the standard Gaussian copula model in the same way that more sophisticated option pricing models are discussed in relation to Black & Scholes. As with the Black & Scholes approach, the model defines payoffs given different states of the world, assigns probabilities to those states and discounts appropriately. The model aims to give the equilibrium valuation for a CDO tranche, and the key challenge is to define the joint distribution of losses; in the end, as in Black & Scholes' model before, the model chooses elegance and simplicity over complexity.

The model starts with individual default distributions. A key step for Li (2000) was the move from a discrete default probability at time *t* to a distribution of default, which he captures with the idea of a survival time. In the first major simplifying assumption, the default or survival time distributions are then mapped to a normal distribution using a percentile-to-percentile transformation.

The next step combines the individual default distributions, 'copula function is a simple and convenient approach' to doing so when taken together with a

dependency structure (Li, 2000: 12). Having previously mapped individual distributions to standard normal distributions it is possible to define a copula that combines all of the individual assets using a copula correlation matrix of pairwise correlations (Li, 2000: 16). The theory now faces the problem that as the number of assets (*n*) rises this matrix quickly becomes large. Each new asset requires (*n*-1) correlations. This becomes onerous from both an input and a calculation perspective.

The model makes its next simplifying assumption by moving from an *n*x*n* correlation matrix to a factor model.[225] Default times are made dependent on some latent variable, the underlying factor taken to be the 'state of the economy' (Vasicek, 1987: 2), the 'default environment' (Hull et al., 2009) or similar factors. As with the Capital Asset Pricing Model (CAPM), this provides a neat solution to the compilation of huge correlation matrices; each asset now only requires one correlation input rather than (*n*-1), greatly simplifying the definition of inputs and calculation.

The final step is to turn the cumulative default distribution into a loss distribution from which tranches can be priced. This makes use of the second great benefit of the factor model: any given draw from the default distribution is conditionally independent. This allows aggregation using the binomial, which is of great practical benefit thanks to its relative simplicity (Hull and White, 2004, Wang et al., 2008). Using simulation it is possible to associate each draw with a number of defaults and therefore with repeated draws to construct a distribution of defaults.

In running this final simulation, three further simplifications are made. Recovery on defaulted assets is assumed to be fixed at 40%. The individual asset default distributions, often gleaned from the market spread curves, are put aside and a single price for the basket of assets is used to determine the spread for all. Finally – and critically, as explored later – individual correlations are also put aside and a

[225] Financial economists encountered a similar problem when first looking at efficient portfolios following Markowitz's (1952) breakthrough paper, and dealt with it using the approach taken by the CAPM model, i.e. with a factor model (e.g. Sharpe, 1964). The same route is taken in the standard CDO model and indeed in most of its extensions.

single average correlation is used across all assets (Hull and White, 2004, Wang et al., 2008).

To summarise the approach to defining the distribution of payoffs, then, the distribution of the pool of assets in the CDO is theoretically modelled by combining the individual loss distributions of each asset, expressed as time to default. To make this problem tractable, numerous simplifying assumptions are made. The most important are: first, individual times to default are transformed to be normally distributed, giving easily definable and mathematically malleable distributions. Second, a factor model is used, much as in CAPM, which both reduces the number of correlations (from a correlation matrix of n^2 inter-asset correlations to n asset-factor correlations) and, perhaps more importantly, allows assets to become conditionally independent, making both theory and practical computation simpler. Third, the input requirements are further simplified by inputting the same average default and recovery probabilities for all assets.

Both risk-neutral pricing and the choice of simple distributions make for ease of calculation; furthermore, the distributions in particular allow the models to revolve around one key organising factor: the volatility applied to the second partial derivative with respect to the underlying price (known as gamma) in options and the single correlation that describes the relation of the assets in the CDO to the latent factor. The volatility and correlation terms that ‘fall out’ of the models are termed the implied volatility and implied correlation. As I explore below, this reduction to a single element is critical to the usefulness of the models.

8.2.3 Skew and smiles

As elegant and tractable as the models are, they are not particularly successful at predicting derivative prices; in particular, the family of normal distributions does not seem to empirically match the distribution of financial prices. This is seen most importantly in the presence of ‘skew’ and ‘smiles’.

Skew and/or smiles are observed in both the implied volatilities of options and implied correlations of CDOs. Option skew describes how implied volatilities for

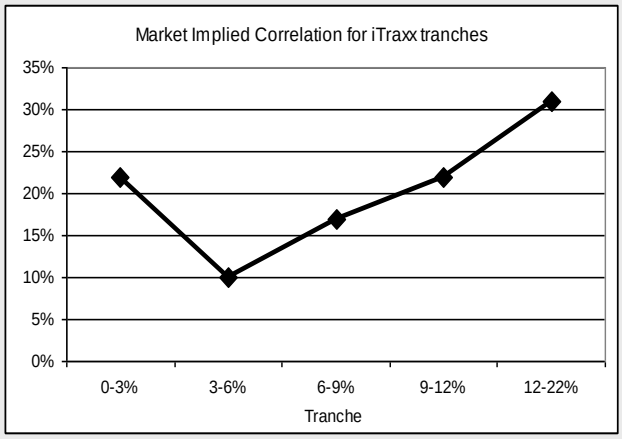
different options on the same underlying price index are not equal, such that low strike options have a higher implied volatility than those at the money or with high strikes.[226] Black & Scholes assumes one lognormal distribution of forward prices with a mean of the current forward price and a volatility as defined by the market's best guess of future realised volatility (kept in line with this best guess by arbitrage, as outlined above). All the various derivatives possible on this single underlying should theoretically be priced with the same volatility input. But observed prices imply different volatilities for different derivatives on the same underlying. This can only mean that the model is wrong; after all the reference price will only exhibit one realised volatility in the end.

In CDO tranche markets, implied correlation also displays skew/smiles (Burtschell et al., 2009). For a given CDO at a given time, only one portfolio default distribution, made up from individual default distributions combined using correlation as described, exists in the theory. However, market prices can be observed to produce a 'smile' structure to implied correlation across tranches, such that correlations for mezzanine tranches are lower than for those for equity and senior tranches. Base correlations – correlations for equity tranches of different widths – can be seen to have a skewed structure such that equity tranches with higher detachment points have higher base correlations than those with lower detachment points. These effects are illustrated in Figure 8.2 below.

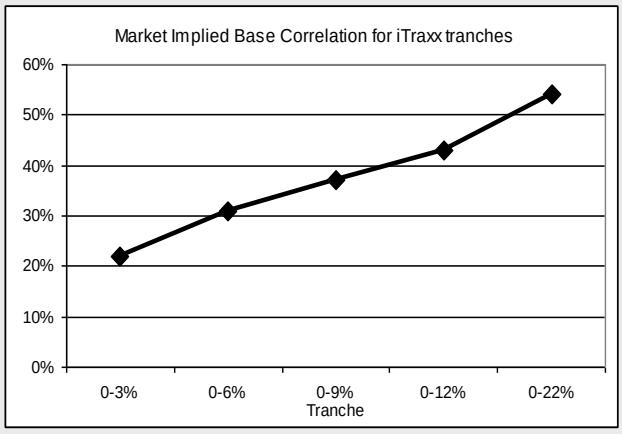
Figure 8.2: Implied Correlation Skew and Smiles

[226] For some markets such as Foreign Exchange this can be observed as a smile whereby strikes far away from the forward price both high and low have higher implied volatilities than at-the-money options.

Tranche	Market Implied Correlation for iTraxx tranches
0-3%	22%
3-6%	10%
6-9%	17%
9-12%	22%
12-22%	31%



Tranches	Market Implied Base Correlation for iTraxx tranches
0-3%	22%
0-6%	31%
0-9%	37%
0-12%	43%
0-22%	54%



Source: Burtschell et al., 2009

What is most important with regard to skew, however, is that the model itself is still used to communicate the relative price levels. Skew is part of the standard language of CDO and option markets, despite the model apparently implicating itself in the process. Skew is an understood and continuing feature of these markets only because the standard models are used to express it and only exists and persists because the standard models continued to be used.

Numerous alternatives to the standard models have been proposed, typically elaborating on them with more sophisticated mathematics – e.g. using more complex distributions or additional factors – but they have not managed to

dislodge the simpler models as the standard approach. For example, changing probability distributions can sometimes appear to reduce skew, so in CDO models the standard normal might be replaced with, for instance, students-T (e.g. Andersen et al., 2003), double-T (e.g. Hull and White, 2004), Marshal-Olkin (e.g. Giesecke, 2003) and so on.[227] Secondly, additional factors have been added to the usual one-factor model (e.g. Gregory and Laurent, 2004), or indeed the factor model can be replaced with other devices (Duffie and Gârleanu, 2001, Hull et al., 2009). Regardless of their success or otherwise in consistently predicting future prices, none of these models has replaced the standard model.

Bound up with the phenomena of skew and smiles, the models have proved resistant to crashes that appear to disprove their worth. During the crash of 1987 the possibility of re-hedging option positions dried up and therefore the option valuation models ceased to be either used or useful (Yamada and Primbs, 2002, MacKenzie, 2004). Black-Scholes-Merton option valuation models reacted by incorporating skew (MacKenzie, 2004, 2006). This part of the riddle extends to risk management more generally, which somewhat paradoxically appears to grow more entrenched each time it is found wanting, for instance in 1988 after the LTCM/Asian/Russian crisis, after the dotcom losses and the most dramatic of all, after the 2007/8 crisis.

In short, the models purport to provide valuations for derivatives (Hull, 2009), yet despite appearing not to be very good at this either theoretically or empirically, they continue to be used. Indeed the phenomenon of skew shows that the models are not accurate for predicting prices, and simultaneously that they remain centrally important to these markets; moreover they are resistant to crashes, which again appears to disprove their worth. In both the use of risk-neutral pricing and the choice of distribution they appear to value elegance, tractability and simplicity over accuracy, and this presents a riddle.[228] One answer to the riddle is that models are in fact doing something other than they advertise. In

[227] For a comparative analysis see Burtshell, Gregory & Laurent (2005).

[228] As Gregory & Laurent (2004) note: 'The Gaussian copula model seems to have become an industry standard for pricing.' They remark that its appeal is 'partly due to its ease of implementation via Monte Carlo simulation' and its tractability. They then explore drawbacks to the applicability of the one-factor Gaussian model.

particular, they may be useful in ways other than those they profess, and may be more constitutive of markets than they appear. So what is the usefulness of these inaccurate models? (Millo and MacKenzie, 2009).

8.3 Prices in derivatives markets and the role of models

In searching for an answer to this riddle it is worth asking why derivatives markets need models, when other established markets do not. This section shows that the features of the model identified above as problematic are actually useful for the management of growing volumes of derivatives trading; in particular, they allow traders to translate between the recorded money prices of completed transactions and the potential prices of new transactions. In this translation, arbitrage-free pricing and the relatively simple nature of the probability distributions are a great help.

That they should need mathematical models to make this translation stems from the particular nature of derivatives markets and derivatives themselves. This is shown by drawing on the theory of derivatives developed in earlier chapters, further elaborating on the nature of price and the motivations of participants in these particular markets, and enriching the analysis with economic sociologists' observations on the use of these models. Prices in derivatives markets are found in the following analysis to be disconnected from production and value, to exhibit great volatility and arbitrariness and to be greatly affected by the ebb and flow of demand and supply from market participants aiming to capture short-term price moves by buying and selling. Combined with the particular nature of derivatives, this reveals the central use of valuation models to connect the prices of completed transactions with the prices of potential new transactions, and in doing so, to allow dealers to operate on a large scale.

8.3.1 The role and nature of prices in securities and derivatives markets

Chapter 4 introduced banks, as securities dealers, as makers of securities markets who, mobilising otherwise idle money from around the economy, direct it to profitable ends thus generating additional surplus value out of which they are paid. They do this by issuing and sustaining claims to monetary value (in this

case, securities). Securities claims do not involve an engagement with labour but are rather a division of surplus value among capitalists. The establishment of joint-stock capitalism makes it increasingly possible to make an analytical distinction between capital as property and capital as process. In this split, surplus value is divided: securities, representing capital as property, are paid interest while capital as process is paid profit of enterprise (Chapter 4). This split, and therefore the price of securities, is purely one of demand and supply between capitalists and as such lacks a centre of gravity such as the one that as the struggle between capital and labour provides to the rate of profit (Chapter 4).

Marx points out that not only can things such as a promise to pay have a price without value but also that price plays a critical role in their form. In his discussion of value and price in the opening chapters of *Capital*, Marx notes that commodities have both a value and a price and that there can be a 'quantitative incongruity' between them (Marx, 1976: 193). Critically for derivatives, the possibility of a quantitative incongruity opens up the possibility of:

> [a] qualitative contradiction**,** with the result that price ceases altogether to express value, despite the fact that money is nothing but the value form of commodities. Things which in and for themselves are not commodities, things such as conscience, honour, etc., can be offered for sale by their holders, and thus acquire the form of commodities through their price. Hence a thing can, formally speaking, have a price without having a value (Marx, 1976: 193).

Promises to pay such as securities and derivatives can therefore have price without having value, again emphasising the distance of this price from central tendencies such as the rate of profit; importantly, through price they can assume a commodity form without being commodities.

The next analytical stage, discussed in Chapter 5, has shown how institutional investors emerge, and in doing so how the category of securities trading developed in Chapter 4 can be split into trading to profit from price changes and trading to invest or recover otherwise idle funds. The growing importance of

institutional investors means that trading concerned with capturing price movements becomes increasingly important in securities markets. The nature of securities markets gives rise to institutional investors that emerge to reduce the asymmetry between investors and banks as dealers. Institutional investors are able to pool liquidity and restrict liquidity demands on their liabilities, which isolates their actions in securities markets from liquidity concerns. As a result their actions in securities markets become concerned more with capturing price movements by buying and selling than with depositing and withdrawing liquidity. Banks as dealers are equally concerned with capturing price movements as their primary form of profit takes the form of a bid-ask spread.

In this way the nature of securities markets' prices, dictated overwhelmingly by the actions of market participants buying and selling to profit from price changes, is taken a stage further. In the first stage, simple securities exchange, the securities was already distanced from outside pressures and especially from production, being purely the result of a division between capitalists. In the second stage, with the emergence of Institutional Investors aggregating individual investors and pooling liquidity, the liquidity management aspects of simple securities exchange are greatly reduced. Individual lenders are essentially shut out of acting in the markets themselves, and as a result the price is now overwhelmingly determined by market participants concerned solely with capturing price moves by buying and selling (Chapter 5).

In derivatives markets, which develop out of securities markets focused on trading for price change, the isolation of price from effects other than the ebb and flow of demand is even more starkly presented. The cash-settled derivative excludes the possibility of an exchange of an underlying asset for money; most importantly, this includes the exchange of promises to pay. As a result cash settled derivatives cannot extend credit, and the needs of borrowers and the ebb and flow of their hoards and borrowing requirements are also largely excluded from the activities of the market itself. Market participants are explicitly trading only to capture price moves in the underlying price index. In short, the cash-

settled derivative makes the division inherent in securities markets discussed in the previous stage concrete (see Chapter 5).

The three stages outlined above theorise the successive distancing of the price and actions in financial markets from production and a corresponding increase in arbitrariness and unpredictability. The appearance of these markets is captured by Keynes.[229] Even in the 1930s he was able to write that 'the energies and skill of the professional investor and speculator are mainly occupied … not with making superior long-term forecasts of probable yield of an investment over its whole life, but with foreseeing change in the conventional basis of valuation a short time ahead of the general public' (Keynes, 1997: 154-5).

Keynes famously compares:

> professional investment … to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole. [To succeed in such a market] it is not a case of choosing those which, to the best of one's judgement, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what the average opinion expects the average opinion to be. (Keynes, 1997: 156)

Keynes argues that this behaviour drives out longer-term investing: 'He who attempts it must surely lead much more laborious days and run greater risks than he who tries to guess better than the crowd how the crowd will behave; and given equal intelligence, he may make more disastrous mistakes.' In an age of institutional investors and extensive benchmarking of fund managers' performance, Keynes' last point in the section I am quoting has perhaps even more pertinence now than it did then:

[229] The volatile and arbitrary nature of price and the actions of market participants trying to capture movements in that price, of course, also prompt the use of the casino as metaphor, most famously in Strange's (1986) *Casino Capitalism*.

> Finally it is the long-term investor … who will in practice come in for the most criticism, wherever investment funds are managed by committees or board or banks. For it is in the essence of his behaviour that he should be eccentric, unconventional and rash in the eyes of average opinion. If he is successful, that will only confirm the general belief in his rashness; and if in the short run he is unsuccessful, which is very likely, he will not receive much mercy. Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally. (Keynes, 1997: 156-8)[230]

Neoclassical financial economics also concurs with this basic appearance of financial price, i.e. as unpredictable, albeit with different theoretical underpinnings. Prices appear to follow a 'random walk', where the price today is the best guess of the price tomorrow; in essence, price moves in financial markets cannot be predicted (Rutterford, 1993, Fama, 1965). This appearance is consistent with the theory of financial prices developed above and the theory developed by neoclassical economics to explain it, namely the efficient market hypothesis (EMH) (Fama, 1970). The theoretical thrust of the EMH, however, namely that 'information [about the underlying processes paying into them] is immediately reflected in stock prices' (Malkiel, 2003), is almost the opposite of that proposed above, where arbitrariness reflects a disconnection from the economic rather than an accurate reflection of it.

This subsection has stressed the volatility of financial prices because, as I will show, this aspect of them is critical for uncovering the uses of financial models. However, it must also be noted that they also contain tendencies to regularity, not least links to the underlying economy. While securities' prices are removed from value they nevertheless remain a claim on an underlying process, including those

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[230] Keynes's disapproval of the resulting state of financial markets: 'There is not clear evidence from experience that the investment policy which is socially advantageous coincides with that which is most profitable', strongly echoes Hilferding on the same subject: 'The fact that speculation is unproductive, that it is a form of gambling and betting … does not run counter to its necessity in a capitalist society … but simply testifies against the way in which this society is organised' (Hilferding, 1981: 138-9).

processes producing surplus value. At the macro level they 'cannot move for long in a direction contrary to the rate of profit' (Lapavitsas, 2003: 27). Similarly, for derivatives the construction of an underlying price index ensures a separation from actual trading in the underlying; nevertheless there remains a connection if the measurement is to appear valid and to attract trading. So, for example, despite recent wrongdoing LIBOR is related to the rates at which banks lend, and the price of an abstract ton of standard quality grain is related to the price that a farmer will obtain when selling his particular grain.[231] Moreover, high trading volumes and arbitrage-free valuation models themselves bring a degree of regularity and transitivity to financial prices.

The point is, however, that the nature of prices in these markets, in particular their distance from production, admits increased possibility for 'volatility and arbitrariness' (Lapavitsas, 2003: 27). In a market where participants are concerned with capturing price moves and recall derivatives markets are constructed explicitly to allow participants to do so, it is this volatility and arbitrariness that is most important, for it is in volatility that trading profits are made.[232] It is also critical to explaining the role of valuation models and risk management.

8.3.2 Completed vs. potential exchanges

In markets where the price has a large element of volatility and arbitrariness and in which the principal aim of participants is to gain from capturing price moves by buying and selling, the ability to know the price at which the latest transactions have occurred is vital. Especially as a market of this sort becomes

[231] As noted in Chapter 5, the quantities of different derivatives traded is also related to activities in the rest of the economy. Derivatives reflecting sports outcomes, for example, are less widespread than those connected to interest rates. Institutional investors (and dealers, inasmuch as they hold portfolios of claims) trade derivatives as part of the business of holding an inventory of assets, which to a large degree reflect the funding requirements and therefore the activity in the rest of the economy.

[232] Holzer and Millo (2005: 240) argue that financial markets' 'instabilities are increasingly related to processes *internal* to the markets and to the organisations operating within them – rather than to *external* events' (emphasis in original). This change is prompted by changes in the practices of market participants, e.g in Holzer and Millo's study a reduction in the use of 'fundamental analysis' is brought about by a rise in program trading (2005: 233-4). This argument runs against the standard neo-classical argument that 'arbitrage generally serves the useful function of bringing asset prices closer to fundamental values' (Shleifer and Vishny, 1990: 153).

more established, buying at a price higher than others are selling (or selling lower than others are buying) gives others the opportunity to profit and, assuming that the trade is reversed at the market price, sustains a loss. As Keynes (1997: 155) notes: 'the actual, private object of the most skilled investment today is "to beat the gun", … to outwit the crowd and to pass the bad, or depreciating, half-crown to the other fellow'. CDS, where the underlying asset index remains at 1 (representing no default and 100% recovery) while trading is ongoing, again provide an excellent example; to buy and sell CDS for a profit it is critical to know where the market is trading.[233]

Although the category of arbitrage owes more to neoclassical notions of complete markets than to the analysis developed here, the notion of arbitrage can help to identify the importance of market participants trading in line with others.[234] Prices must be arbitrage-free, or market participants face paying over money capital to those who can take advantage of price differentials. To avoid losses, the price of potential new trades must be consistent with the prices of the most recently-completed transactions.

Marx highlights this dual role of price in completed and potential transactions. First, price can describe exchanges that have actually been made, namely the price that provided the seller with money: 'to enable it to render its owner the service of a universal equivalent, [the commodity] must be actually replaced by gold' (Marx, 1976: 197). Second, price can describe potential future prices: 'to establish its price it is sufficient for it to be equated with gold in the imagination' (ibid). This establishment of the price 'in the imagination' is important. The seller of derivatives must 'lend them his tongue, or hang a ticket on them, in order to communicate their prices to the outside world' (Marx, 1976: 189). The distinction is critical to understanding the role of derivative valuation models which, as I

[233] See Chapters 1, 5 and 7 for more details. Trading ceases in CDS once a default event has been declared.

[234] As Working (1953) shows the categories of hedger, speculator and arbitrageur are rarely observed separately. A farmer who uses derivatives to hedge price moves in a type of produce has chosen not to sell when the produce is ready to come to market or to find a buyer for her specific inventory and fix the price in advance. In this way she is at once hedging, speculating and arbitraging. Analytical space for such categories seems only possible in a theory centred around complete markets, where a hedge (with derivatives) is synonymous with selling forwards.

show below, mediate back and forth between the two types of prices. However, to understand why derivatives require a mathematical model to do this it is necessary to contemplate the complexity that derivatives bring to the task and in particular the variety of instruments on the same underlying price index that they make possible.

8.3.3 Increased scope of derivatives brings added complexity

The task of ensuring that the price of potential new trades is in line with latest completed trades is both critical for derivatives, as discussed above, and at the same time made more complex by derivatives' very nature. Derivatives exist to allow market participants to act as if they are buying and selling an underlying asset, the price of which (the only element that matters for the derivative) is represented by the underlying reference price index. To achieve this the derivative has the form of a claim, yet the properties of the claim make knowing the market price more complex. This happens in two ways.

First, because the claim is a bilateral relation between parties, it has specific characteristics which may cause its price to diverge from an identical instrument or trade with a different counterpart; e.g. counterparts present different counterparty credit risks, have different power relations and so on. For now, however, the analysis sets this problem – as indeed the models themselves do, although I return to it later – and concentrates on the difficulties introduced by the second effect of derivatives being a claim.

Second, claims massively increase the array of possible instruments on a given underlying asset. The biggest effect of the introduction of cash-settled derivative claims was the vast increase in the scale and scope of trading (Chapter 5). This is true of the possible instruments even on the same underlying reference price index. First, derivatives extend trading out into the future, theoretically making possible a infinite number of maturities. Even in practice there are a vast number of possible maturities for the simplest of transactions, e.g. a forward purchase/sale. Secondly, more complex claims are possible, most obviously perhaps by introducing optionality. This again massively increases the number of

instruments available to trade in the same underlying asset: even among simple options on the same underlying reference price index with the same expiry, a vast number of strike prices can be used in both put and call options. In both OTC and ETD markets the number of possible derivatives is very large, and in any given time period – a minute, a day, a week, or even a year – there is no practical possibility that a completed price can be observed for all of them.[235]

What makes this vast array of instruments troublesome is that they have a vast array of possible money prices, making life complicated for market participants attempting to propose new prices consistent with those just traded. The prices of this array of instruments must be related, as they are all different ways of acting *as if* participants are buying and selling the same underlying; but even very closely-related instruments can have very different money prices, e.g. even with the same expiry and the same strike, a put and a call will have completely different money prices. If a trader is to avoid being passed the 'bad, or depreciating, half-crown' (Keynes, 1997: 155) he must be able to price them consistently.

In earlier times this problem was circumvented because the range of instruments being traded was constrained, allowing a reverse of the pricing convention;

> On modern option exchanges, an option contract is specified with a given strike price and the price of the option (the premium) is negotiated between buyer and seller. In nineteenth century option markets, the convention was reversed. Option contracts were sold for a fixed price, but the strike price was negotiated between buyer and seller. … The fact that the strike price was the one free variable in the contract may have simplified any rules of thumb used by option sellers. (Mixon, 2009: 176)

[235] On a derivatives exchange this range is finite, as the exchange effectively constrains competition in the creation of new contracts (Fehle, 2006). In OTC markets, while the number of possible transactions is theoretically infinite, standardisation has effectively served to greatly reduce the number of plausible transactions (see Chapter 7).

The most important implication of this historical convention, however, is that a fixed money price dramatically reduces the number of instruments being traded to two: the put and call costing the fixed premium.

In modern markets, market operators need to find a way to ensure that potential new prices are consistent with recently-completed prices; prices must be compared, but may have very different money amounts. This is where the two main attributes of the models comes to the fore: they are arbitrage-free, and they make commensurate an array of money prices by using a common pricing factor, e.g. implied volatility or implied correlation, as the next section explores.

8.3.4 Running valuation models backwards and forwards

Valuation models purport to produce derivative prices as an output, but in the first instance, prices observed in the market must serve as an input. The observed price is translated into an implied volatility or implied correlation by the model. This is then input to the model, which is run in the opposite direction to deliver prices for possible trades that have not yet taken place. In this way the model acts as a pivot or means of translating between the observed prices of completed trades and the prices of different instruments on the same underlying that arise in the imagination of the trader for future possible transactions, as I now discuss.

The parameters of the various valuation models are often divided into those that stem from the definition of the instrument,[236] those that are taken to be observable, and those that are taken to be unobservable. Observable parameters generally include the risk-free interest rate and, given the requirement for facticity (MacKenzie, 2007) explored in the last chapter, the price of the underlying. Those that are generally thought to be unobservable come down to two key figures: the money price of the instrument and a factor that falls out of the specification of the model, e.g. volatility for Black-Scholes and correlation for CDOs (Mayhew, 1995). Yet the model cannot produce a solution with two unobservable parameters. While future prices are unobservable, the money prices of completed transactions are observable. Conversely, the implied volatility or

[236] Which, for example are input as boundary conditions into the Black-Scholes formula and as parameters into the simulation for the Gaussian copula model.

implied correlation, even of completed transactions, is not capable of being observed; the model can only calculate it from completed transactions.

As a result there are two logical phases with respect to the model and prices: in one the model is run backwards, and in the second, forwards (or perhaps vice versa). While this back and forth action continuously compares old and prospective new prices, analytically the starting point is with the money prices of completed exchanges. In the first phase, observed prices of actual transactions are an input and model works to reduce the vast array of possible instruments (e.g. different put-call, expiry, strike combinations) to a single organising factor (e.g. implied volatility). The potentially very different and incomparable money prices of different instruments on the same underlying are translated into common currency, e.g. implied volatility or correlation. In the second phase, the organising parameter, e.g. implied volatility or correlation, is input and prices are produced for potential future trades. Once the money prices of existing trades in a variety of instruments have been translated into a comparable metric in the first phase, a trader can run the model in the other direction to produce new prices for new trades (e.g. any put-call/strike/expiry combinations) to revalue existing trades or to propose new ones.

The riddle posed by the success of inaccurate models begins to be answered. Dealers do not face the market as price-takers in perfect markets; instead they must make the markets themselves. The array of possible derivatives that can be struck, even on a single underlying reference price index, means that dealers must propose consistent prices on related instruments even though the quantitative money prices (of consistently-priced instruments) may be completely different. To do this requires, first, an arbitrage-free model, which is provided by risk-neutral pricing. Second, the array of potential prices should be reduced to a single factor, addressed primarily through the choice of distribution. The choice of lognormal distribution in the Black-Scholes ensures that only one term is left as organising principle: implied volatility. Similarly, the Gaussian copula reduces the complexities of varying tranches to a single parameter: implied correlation. After the sophisticated modelling of the Gaussian copula and more complex

models, the crude approach of a single average correlation for each asset in place of a specific correlation figure for each can now be seen as central to making the model useful.

8.4 Using 'these inaccurate models': from single trade to portfolio management

The preceding sections have analysed how the form of valuation models makes them useful to market makers, drawing on the particular nature of derivatives markets established in earlier chapters. The section above focused on a market maker calculating prices at which new purchase and sales transactions might occur. This section starts first with the pricing of a single trade; however, the business of both dealers and institutional investors is buying and selling to profit from price moves. Once again, the contradictory nature of derivatives as untraded claims to facilitate trading is critical here. The first trade is not sold, rather a second trade is undertaken which, it is hoped, will offset the first. Next, therefore, the analysis must look at how the model can produce a potential price for this second, offsetting trade. Critically, this operation not only prices the offsetting trade but revalues the first, allowing an untraded claim to acquire a price and the commodity form. Third, the analysis shows how valuation models also produce risk measures, and in doing so define and price offsetting trades, not on a trade-by-trade basis but for entre portfolios. Fourth, I highlight some more practical ways in which models have aided the growth of derivative portfolios and markets. Once again, derivatives risk management practices are seen to arise from the particular nature of derivatives markets and not from the general nature of trading things *per se*.

8.4.1 The first trade: hanging a ticket on new trades

The analysis begins with a market maker coming to market to sell derivatives. To do this he must 'lend them his tongue, or hang a ticket on them, in order to communicate their prices to the outside world' (Marx, 1976: 189). As I have shown, valuation models allow translation, without providing an opportunity for

arbitrage, between the prices of completed trades and prices of trades being proposed.

Mackenzie (2006) shows how growing derivatives volumes led to Black & Scholes becoming used in this way in option markets. Individual dealers practised in the art of derivative pricing can make prices on a small number of derivatives positions. However, as derivative volumes and the number of instruments being traded grow, traders are unable to keep track of the multitude of money prices available for different instrument types (e.g. put-call, expiry, strike) on the same underlying reference price index, and require more formalised methods to allow them to quote consistent prices for different instruments.

As a result, Black & Scholes comes to be used to promote consistency between traded and prospective prices by reducing the number of parameters required for comparison. At first this is carried out using paper sheets printed each morning (MacKenzie, 2006: 156-162). The sheets show the money prices for different implied volatilities and strikes (measured as distance in and out of the money) for different expiries.[237] Traders are able to use the sheets to translate back and forth between prices expressed in terms of money and of implied volatility. By observing trades, the trader can find out the volatility at which the market is trading and, knowing current prices in implied volatility terms, can provide a money price for different strike/expiry combinations on the same underlying from the sheet. In time, paper is replaced with calculators and pocket computers.

Similarly, in the trading rooms of dealer banks where OTC trades are priced the first stage is to enter market prices into the model. The model, housed on computers, is then able to produce possible prices for new and different trades consistent with the last observed prices enabling traders to update the prices of observed trades in order to update (and advertise) possible future prices.

To make things easier, traders sometimes trade and communicate solely in terms of the model; for instance, options traders might communicate in terms of implied volatilities. First, this saves time in translation and is based on a standard model

[237] At the O'Conner trading firm the sheets were known as 'pilgrims' or ''grims', so reliant on them were the traders for direction.

so that all traders understand that certain Black-Scholes volatility (or correlation or other factor) equates to a certain amount of money. Second, the price in implied model terms is not as volatile as the money price. Here, the issue is less the array of possible instruments but the volatility of other inputs – thus if interest rates move or times passes the money price of the instrument moves ,even when the implied volatility or correlation remains stable. For instance, in the nascent CDS swaption markets of the mid-2000s transactions were much fewer and generally took longer to execute than the volatile and frequently-traded CDS that they reference; partly for this reason, CDS swaption prices were often quoted by market makers in terms of volatility and not money prices.[238]

8.4.2 The second trade: revaluation

Participants in derivatives markets aim to capture price changes. In such a market a purchase (or a sale) must often be followed by a sale (or a purchase). In derivatives markets, 'selling' an existing position means entering into a new trade that is equal and opposite to the first. The use of the models in doing so is not so different from the procedure above. The model is used to 'hang a ticket' on a potential new trade; the difference is that the terms of the new trade are dictated not by a client's request (or a new perceived opportunity in the market) but by the trade that the party pricing the trade has already completed – the first trade described in section 8.4.1 above.

Critically, although existing derivative transactions are rarely sold, valuing a new and offsetting trade appears to be a revaluation of the existing trade at market prices as if it could actually be sold. Partly because of the infrastructure of the market (including regulation, contracts and clearing – see Chapters 6 and 7), two trades to buy and sell the underlying asset index can be treated *as if* they exactly offset each other; as if the second is a sale of the first. This ability to offset allows the existing derivative, which is not a traded thing, to be assigned a current

[238] 'The market standard for pricing [CDS Swaptions] is an adaptation of the option pricing model developed by Black and Scholes in the 1970s' (Curien, 2006). In theory this means that the underlying is assumed to have a lognormal distribution, which is unlikely to be true of credit spreads. In practice it facilitates communication, e.g. between market participants, and risk management as it allows CDS Swaption traders to make use of existing option pricing software and conventions (Spinner, 2004).

market price that is equal to the potential new (equal and opposite) trade. Partly by being assigned a current market price, the untraded claim takes the commodity form (without being one (Marx, 1976: 193).

This assignation of a price to an untraded object and the resulting adoption of the commodity form is a pivotal point in this analysis, not least because it allows risk management of the completed transactions. The material roots of the models and risk management can be seen in dealers' adaptation to the growing scale of derivatives markets. The models not only become indispensible, but also further facilitate the growth of the market and help derivatives to appear as tradable claims themselves.

Before moving on, it is worth noting the way in which the models move to centre stage. At first, the model price is seen as a deviation from real, i.e. completed, prices of derivatives transactions. As the pricing of new trades becomes increasingly reliant on the use of valuation models, the model price moves to centre stage and model-generated prices appear to be *the* market price. The prices of completed transactions, i.e. those that actually render the seller money and constitute the liquidity that makes it possible for the model to function now come to be seen as diverting from the 'true' or model price.[239]

Closely related to this, the last section noted that the derivative claim makes pricing more complex, first because of the scope of possible instruments (analysed above) and second because the form is a bilateral claim between parties with different credit perspectives, different powers and so on. The analysis so far, and indeed the workings of the model, leave aside this second point and disregard differences in the prices of completed transactions due to counterparty-specific elements.

In fact counterparty-specific deviations from the model price occur to both the model's inputs and its outputs. Traders collecting observed market prices must undertake modelling to estimate the mid-price from observed prices which,

[239] Lukács notes how a similar phenomenon occurs with the widespread emergence of wage labour, where prices become more regular and as a result come to be seen as a dispersion around an ideal and not the opposite (Lukács, 1971: 89).

particularly in OTC markets, differ for reasons specific to the relation between counterparts, e.g. their creditworthiness or market power.[240] Similarly, as traders come to market (e.g. as they take to the exchange pit with their pricing sheets, or the electronic equivalent) they are armed with the model's mid-price However, trades rarely occur at mid-price – the dealer after all makes money from charging the bid-ask spread. The trader therefore starts calculating the actual price to be quoted for a new trade by adding to or subtracting from the model mid-price in order to incorporate a bid-ask spread. In OTC markets, dealers then further add to the mid-bid or mid-ask spread by adding a premium for counterparty credit risk (known as the credit charge), their margin and so on.

8.4.3 A portfolio of trades: risk management

I have shown above how valuation models can find the current market price of a trade to offset a completed transaction. But if market participants, especially dealers, had to match completed trades one-for-one with new trades, the volumes transacted would be constrained as they sought to find perfect matches. Risk-management techniques grow out of valuation models by calculating the new and offsetting trade, not on a trade-by-trade basis but for a portfolio of trades.

The problem of defining and pricing offsetting trades for an entire portfolio is similar in nature to that of pricing a single trade; the difference now is that the quantity of each completed transaction is added to the problem of price outlined above. As noted above, traders could keep track of the market price if a single instrument were being traded, as the conversion from completed to potential new prices would be trivial and there would be no need for mathematical models. Once the increased scope and complexity of instruments made possible by derivatives is admitted, however more formal models are required. Similarly, when considering a single instrument it is possible for a trader to keep track of the net position because the quantity of contracts traded is additive. Once the scope and complexity of derivatives is admitted, however, a model is again

[240] Calibration of the model parameters, e.g. volatility surfaces, to completed market prices is an important task for trading desks, particularly with regard to complex instruments (Benhamou, 2007).

required to make the positions additive. As above, this can be analysed first by varying maturity only and second by adding complexity such as optionality.

Take, for example, a portfolio of securities: a purchase of 200 million and a separate purchase of 300 million of a given security requires an offsetting sale of 500 million. The same is true of a CDS on the same underlying with the same expiry. As soon as the possible scope of derivative instruments, even on the same underlying, is brought to bear, however, things become more complex. Derivatives can have different maturities, so, for example, a purchase of 200 million of a 5-year CDS and a purchase of 300 million of 2-year CDS does not result in an unambiguous single sale of 500 million in either instrument in order to offset the first two trades. The range of maturities in less standardised products is even more bewildering, for example in interest rate swaps. Now add optionality – e.g. a put and a call with different strikes; it is clear that without a model the trader cannot offset these positions unless on a trade-by-trade basis.

Valuation models solve this problem because they provide the sensitivity to moves in the underlying reference price index, or in other words the hedge ratio required by risk-neutral pricing, in order that the derivative position can be replicated with trades in the underlying.[241] Critically, these hedge ratios are additive. To continue with options as an illustration, the hedge ratios produced by Black & Scholes are additive, and therefore the aggregate hedge ratio of various purchases and sales of puts and calls on different strikes and expiries can be calculated. Similarly, the hedge ratio of potential new trades can be calculated. In this way the trader can select an appropriate quantity of an instrument in order to adjust the aggregate sensitivity of his portfolio to moves in the underlying reference price index. The valuation produced by the derivatives models have sensitivities to other factors beside the underlying reference price index, and valuation models produce sensitivities to a variety of input parameters – known as ‘Greeks’ for the use of Greek letters in their naming conventions (Hull, 2009).

[241] Millo and MacKenzie highlight how the dual output of the models, both in prices (as seen above) and in sensitivity to moves in the underlying reference price index, makes them so useful (Millo and MacKenzie, 2009).

Risk management and valuation theory: calculating for growth

Given the nature of derivatives as future cash flows, sensitivity to interest rates and time are important examples.

Greeks also include sensitivity to the single organising parameter in the model, e.g. implied correlation or implied volatility. What started the analysis as a device to translate between the money prices of completed and potential prices has become in turn an index to be bought and sold. As with derivatives' underlying reference price indices, it is impossible to buy implied parameters themselves; it is only possible to trade more derivatives. Initially this is via derivatives that reference the same underlying reference price index, e.g. a portfolio of bought options on the S&P 500 will be long implied volatility – selling options on the S&P 500 will offset this sensitivity to implied volatility. In a second stage, however the implied volatility itself can be measured, standardised, formalised and published as an underlying price index upon which derivatives can be struck; in the case of the S&P 500 this is the Vix volatility index (Zhang et al., 2010).

By summarising the portfolio in this way the model provides the specification on a portfolio basis (and not on a trade-by-trade basis) of new trade or trades that offset those that have gone before, or in other words that constitute the sale to the original purchase (or the purchase to the original sale) on a portfolio basis. The model allows risk management of the portfolio. Now it is possible to see the inversion that occurs with the widespread establishment of derivatives trading and risk management. In the first instance it is risk management that allows the growth of derivatives trading by allowing the management of large-scale trading and portfolios. With the widespread establishment of model-based derivatives trading, however, it is derivatives trading that allows risk management. The practice of trading a large portfolio using the valuation models has bought about the objectification of risk management, and with it an inversion.

8.4.4 Portfolios in large organisations: division of duties and communication

More concretely formalised valuation and risk management has played a vital role in the growth of these markets in the context of the very large dealers and institutional investor firms that constitute the derivatives market, allowing a

division of duties within individual banks through communication and coordination (see Chapter 7 for a similar role played by contracts) and communication outside the firm, above all to liability holders (see Chapter 6 for a discussion of risk-based regulation as a means of communicating with liability holders).

Turning first to the models' usefulness internally, there is an additional advantage to their use when it comes to growing derivatives business in the context of a large organisation: in order to trade derivatives on a large scale it is necessary to divide up the work (see Chapter 7). Valuation models and risk management are among the practices that emerge to manage this division of labour. For example, valuation models allow traders to report their overnight positions to management, and one of their early roles was to allow management to aggregate trading positions across several traders, and indeed across exchanges (MacKenzie, 2006).[242]

The new banking activities of securities and derivatives dealing, and the possibility of catastrophic losses from them as highlighted by the stock market crash of 1988, also created the need for increased external reporting by dealer banks. Banks took steps to mitigate the risks of new activities and, as importantly, needed to be seen to do this by liability holders (see Chapter 6). Risk management is used to communicate with and maintain the confidence of liability holders in a number of ways. For example, valuation at market value is the backbone of fair value accounting for financial reporting (Financial Accounting Standards Board, 2007), and modelling forms a critical component of the regulatory capital requirement, e.g. VaR and exposure at default (EAD) calculations (BIS, 1996, 2006).

8.5 Conclusion: price, the commodity form and liquidity

Valuation models and risk management are bound up with the increase in derivatives trading witnessed over the last 30 or so years, but they are also

[242] The division of labour necessary for operating derivatives dealers on a large scale and the devices that emerge to manage this coordination illustrate the more abstract idea that man acting socially creates ideals that take on an objective force (Ilyenkov, 1977, 2012, Pilling, 1980,).

entirely reliant on continued trading. This reliance results in an inherent fragility in derivatives markets which are built on valuation models and risk management.

This chapter has shown how the expansion of banking activities to include first securities and then derivatives dealing, the rise of institutional investors to face them in financial markets and the resulting character of derivatives markets gives rise to a need for valuation modelling and risk management practices. These practices emerge in the face of, and to facilitate a growth in, derivative trading volumes, motivated by banks' dealing profits.

First, derivatives markets require a device by which to translate the money prices of an array of possible trades into a common currency. This need stems from a combination of two elements. First, markets in which participants aim to capture gains from price moves by trading with one another, and where prices display high degrees of arbitrariness and volatility. Combined with, second, the enormous range of possible instruments, even on the same underlying reference price index that cash-settled derivatives make possible.

As noted throughout this thesis, the central contradiction of derivatives is that they are untraded claims to facilitate trading. In these markets, where trading occurs to capture price changes, a purchase is usually accompanied by a sale, but because derivatives are untradeable this must occur via a new offsetting derivative claim. Valuation models allow the calculation of a price for the offsetting trade, whether completed or only calculated in the imagination of the trader, that can be applied to the existing untraded claim. On acquiring a price, the untraded derivative takes on the commodity form, further enhancing its tradability, not least because now the trader can use valuation models to risk-manage her existing trades on a portfolio rather than a trade-by-trade basis. By using the formal mathematical properties of the valuation models, traders have become able to manage large portfolios of derivatives and greater trading volumes. Derivative valuation models, and by extension risk management, are bound up with the growth and changing character of derivatives from untraded claims to claims, which themselves appear to be tradable.

This is a fragile construction because it is circular: large trading volumes in derivatives markets are both a precondition and a result of valuation models and risk management. Derivatives markets rely on valuation models and risk management, and valuation models and risk management rely on active trading. If trading is interrupted, for example by a crisis, the models' calculations become meaningless and, as derivatives revert to their basic state as untradeable claims, useless.

If there is no trading, there is obviously no need to produce prices for potential new trades. It becomes impossible to apply the price of an equal and opposite potential new trade to existing transactions: mark-to-market valuation of existing trades is not possible if there is no market. Hedge ratios, or Greeks, become impossible to calculate if it is not possible to calculate a valuation – indeed there is no sense in calculating the sensitivity to market price moves if there are no markets. In short, the calculations of valuation models and risk management models, which make derivatives trading possible on a large scale, become meaningless if there is no ongoing trading. In fact this was clear from the first exploration of risk-neutral pricing above – Black-Scholes must be acted out to make it true, and inability to trade the replicating portfolio invalidates the calculation. A cessation of trading such as might happen in a crisis, and as indeed did occur in many parts of the US residential mortgage markets in 2008, renders the calculations of valuation models meaningless and risk management practices impossible, as offsetting trades cannot be completed.

Valuation models and risk management enable the derivative to transcend its basic nature as a claim and allow market participants to treat it as a 'thing'; taking on the form of a commodity that appears to be bought and sold in the market. But without ongoing trading the derivative reverts to a claim on another party settled by the underlying reference price index, and valuation must begin on another basis entirely such as historical cost or the current level of the underlying reference price index.[243] The problem with such an approach to managing

[243] Of course in many instances the underlying reference price index is itself calculated or modelled from market prices. In this case even this calculation may become impossible or difficult.

derivatives is that it is antithetical to the nature of derivatives, which are instruments that emerge to facilitate trading and can only be differentiated from other financial instruments on this basis.

Finally, then, there is something paradoxical about risk management when viewed from the perspective of international bank regulators and bank liability-holders: to calculate potential losses in times of market disruption it assumes the continued presence of working markets, and as a result is likely to be found wanting exactly when it is most needed by bank liability holders or regulators. The answer to this apparent riddle is that the models perform a very useful role for those who practice risk management: they increase the latters' ability to manage large portfolios and high trading volumes and thereby their profits. Those practicing derivatives trading and risk management need something that is useful to them most of the time rather than something to protect them against occasional crashes (Millo and MacKenzie, 2009).

9 Conclusion: making markets for themselves

9.1 Introduction

When seeking to understand what derivatives are and how the markets for them came to be so large compared to the broader economy, two related approaches are most commonly heard. First, the more theoretically and firmly neoclassical argument is that derivatives complete markets (Ross, 1976). There are several problems with this approach, among which three merit mention here. First, it does little to help understanding of the financial crisis that began in 2007/8. The complete markets argument suggests that approximately US$600 trillion of notional outstanding in OTC alone was not enough derivatives, that the markets were not complete enough.; a more common understanding of the crisis argues that these markets and their size were very much part of the problem. Secondly, and typically for neoclassical theory, it is a static explanation that does not explain how or why derivatives markets changed when they did. Third, it offers no insight into why these particular markets need banks at their centre. Even Alan Greenspan (former Chairman of the Federal Reserve, 1987-2006) admits this might not be the best theory of financial markets (Andrews, 2008).

The second common and related approach, invoked on occasion by both heterodox and orthodox economists, argues that the breakdown of the Bretton Woods agreement led firms to hedge, and derivatives emerged to help with risk management, leading to today's derivatives markets. While at least historical and describing a process of development, this approach also struggles to get to the heart of derivatives markets. One complaint against it is that it cannot explain the size of these markets, the turnover of which is several times that of world GDP and world trade; another is that almost none of the phenomena to be explained involve firms hedging.

Beyond from these two problematic explanations, Marxist and heterodox writers, unsurprisingly, offer richer accounts of derivatives but tend to focus on the ways in which derivatives and capitalism are changing one another, looking outwards from derivatives markets to their relation with accumulation more generally. How

derivatives and broader society are affecting each other (especially how derivatives are changing society) is a, if not *the,* critical question and this chapter finishes with some of the ways in which further research could address this area.

To analyse the ways in which derivatives affect society and accumulation more generally, a thorough understanding of derivatives themselves and their process of development, in particular in the last 30-40 years is necessary. There does not appear to be an approach that provides a logical and detailed construction in theory that corresponds to actual observations of derivatives markets; there is no theory that is more inward than outward-looking and focuses more on what derivatives are than on how they have changed the world, although the former will help explain the latter. This is the task that this thesis set itself: to clear a path through existing theories to arrive at an understanding of derivatives markets that accords with reality. Only with such an understanding does it becomes possible to understand detailed practices in derivatives markets and then to explore their relation with accumulation more generally, and indeed to form policies that confront it.

Approaching the construction of such a theory, it soon becomes clear that a theory of derivatives also needs to be a theory of banks. This finding further confirms the lack of theories that can explain derivatives today: the existing theories of banks tend not to treat banks as derivatives dealers, and existing theories of derivatives tend not to treat them as a banking activity. New theory has to cut a new path, and in doing so, fill in a gap in existing theory. The first thing that this thesis has shown is that whatever they were before, and whatever they become in the future, in the last 30 to 40 years derivatives have become a banking activity. That derivatives are a banking activity should not be surprising. The general and financial press confirm it daily, whether reporting the collapse of Lehman Brothers, Goldman Sachs' deals with the Greek government, (Robinson, 2010) or Deutsche Bank's dealing in CDS (Alloway, 2010). Researchers know it too: in the quote that opens this thesis, the authors visited banks' trading floors (Knorr-Cetina and Preda, 2005: 43-4). With this thesis we can begin to know theoretically as well that derivatives are a banking activity .

The second thing that this thesis has shown is that derivatives are for trading. The behaviour we observe in derivative markets is trading; repeated buying and selling to capture and profit from changes in price. Theoretical analysis shows that the derivative form that has developed was developed by banks, and is suited to trading. The trading behaviour that can be observed is not accidental. Not only is buying and selling for a profit the basis of dealer bank's bid-ask profit, it is also the source of dealer and institutional investor profit as a result of taking positions in derivatives. In contrast to the notion of trading, hedging, arbitrage and speculation are only of secondary use in understanding derivatives markets and do not offer any analytical purchase on what these markets are really about. Almost all derivative activity involves aspects of all three and as a result they are useful mainly descriptively as commonly-understood words.[244] Like much of neoclassical economics, from which they derive, these terms do not probe beneath appearances.

Again, the fact that derivatives are a trading activity involving repeated and often frenzied buying and selling should not be surprising. The press and financial press confirm this regularly with reports covering the wide spectrum from the enormous official statistics to the images of trading floors that provide the daily backdrop to market reports. Economic sociologists know it too: Knorr-Cetina and Preda's (2005: 43-4) traders 'strap themselves to their seats … their eyes will be glued to [their] screens,… in what appears to be total immersion in the action in which they are taking part'. Again, with this thesis it can also come to be known theoretically that derivatives are for trading, showing moreover that this facility for trading arises from the nature of derivatives as claims which are the domain of banks.

Thirdly, the present theory of derivatives and banks as dealers provides a base for the exploration of more detailed aspects of derivatives markets behaviour and for further exploration of the relationship with accumulation more generally. Much of the academic theory about derivatives focuses on price. Prices in derivatives markets are not the focus of this thesis, but having built a theoretical framework

[244] For example Gowan uses the term 'speculative arbitrage' to describe Wall Street bank activity. In many ways it is a useful way to describe their activities, but as these activities also include an element of hedging it is also possible to describe them as 'speculative arbitrage hedging', which brings us back to where we started.

for understanding derivatives in general it is possible to provide insights into derivatives prices and the theories that surround them and their uses. The framework can also build a theory that leads to understanding other, more concrete aspects of derivatives markets such the legal documentation used and the evolution of bank regulation.

In short, this thesis observing that banks are at the centre of derivatives markets has developed a theory of banks as derivatives dealers, using a political economy approach that draws most heavily on Marx and Marxist political economists. Original in itself, more importantly this approach provides original insights into derivatives markets and the evolution of banks and their role as derivatives dealers. The analysis begins with the basic categories of Marxist analysis and sets out how Marx and others theorise the emergence of banks and the financial system. It does this, however, with a critical eye, aware, as earlier writers could not be, of the development of banks into, among other things, derivatives dealers. Having reviewed the existing theory of banks emerging from capitalist dealings in this way, it then extends that theory to incorporate new kinds of securities dealing and, most importantly, derivatives dealing. The theoretical picture of derivatives markets that results is a recognisable reflection of their observable reality as presented in the introduction. This theoretical development of the evolution of banks to encompass derivatives-dealing activities is the core of the thesis and not only extends existing theory but also provides a theoretical framework for further analysis. The analysis then both builds on and enriches this theoretical framework by incorporating more concrete manifestations of banks' activity in the construction of derivatives markets. Banks' practices in derivatives markets are analysed in light of the central contradiction inherent in derivatives; they are an untraded claim that emerges to facilitate trading, a contradiction that can only come to light through the theoretical framework built in previous chapters.

Throughout this thesis I have stressed that markets do not make themselves. Analysis must ask how they are made. Banks, observed initially as central to derivatives markets, have been shown to draw on the nature of their specialisation in capitalist economies to make derivatives markets, both by standing ready to

buy and sell and by providing the necessary infrastructure. A gap in existing theory is identified in the opening chapter; no theory so far has explained the centrality of banks to derivative markets. This thesis fills this gap.

9.2 **Banks making markets for themselves**

Banks have not only made financial markets; they have made those markets for themselves. They have made them for institutional investors too, but inasmuch as banks profit from institutional investors, the markets that banks make are above all for themselves. The material presented throughout this thesis shows how banks have done this in four ways, Future research can build on the theoretical analysis presented here to look outwards at derivatives' relation with the rest of society instead of focusing inwards on derivatives markets,

First, a market is an abstract construction. As stressed in Chapter 2, to understand how things have developed as they have, it is necessary to ask how they were made. This means, first, that the analysis should ask how things observed in reality have come about. Second, it must ask how the abstract construction of the market came to be made and attempt to understand how markets were made in reality by building their abstract construction.

Neoclassical theories of financial markets, and indeed some market participants treat the market as a pre-made, transhistorical construction divorced from social context; in this view the market (presumably) emerges spontaneously when restrictions on it are removed, as the most efficient way to organise society. In securities and derivatives markets this view manifests above all with the idea that the market will buy when an individual wants to sell, and sell when an individual wants to buy. Thus it is the market that completes the M-M' relation when securities are sold or offsetting derivatives positions are taken.

Interestingly, while this view might be shared by neoclassical economists and parts of the back and middle offices of dealer banks, the front office, sales and trading staff instinctively know better (MacKenzie and Millo, 2003, MacKenzie, 2006). Those involved in trading see it as a much more personal affair: a derivative trade is not executed by Goldman Sachs but by Sarah at Goldmans or Tommasso at Deutsche. Institutional investors know which dealers are strongest

in which instruments. Corporate entertainment, extortionate bills in French restaurants and above all the importance of 'colour' (see footnote 137) all attest to the fact that it is not the market but another trader, usually at a dealer bank, that buys when a trader wants to sell and sells when a trader wants to buy.

Second, banks make these markets, and moreover they them make them for themselves. First, they make markets. Analysis of the expansion of commercial banking activity begins in Chapter 4, which shows how buyers of securities are the equivalent of depositors in a commercial bank. The bank's promise to redeem the deposit on demand is a parallel its offer to return the security holder to money through exchange. It is the ability to exchange the security holding for money – to transform a particular promise to pay for a generally acceptable form of value – that marks joint-stock capitalism as qualitatively different from owning capital in partnership. Banks as market makers standing ready to buy and sell, and not the market, backstop this ability to exchange claim for money. This role of banks as market makers is even clearer in OTC derivative markets, where they stand as one counterpart to every outstanding trade (see Chapter1).

Second, they make the markets for themselves. Chapter 4 analyses banks making securities markets for borrowers and lenders; Chapter 5 shows how they increasingly make markets for themselves and for institutional investors. The rise of institutional investors insulated market participants from the ebbs and flows of depositors' liquidity and marked a point at which market participants turned in upon themselves in many ways. Trading became increasingly bound up with capturing price moves on the market, which consisted of other dealers and institutional investors intent on the same purpose.

Derivatives markets took this making of a market for themselves one step further. Where the emergence of institutional investors took lenders out of the picture, now cash settlement takes borrowers out too. Cash settlement ensures that there is no underlying exchange of money for asset; even the exchange of the borrowers' promise to pay for money is removed from derivatives markets, and with it the connection to borrowers and production. In making derivatives markets, dealers make markets that are increasingly cut off from external influences, on which

they and institutional investors can trade with each other as each attempts to capture price changes.

Third, banks make the very objects to be traded (MacKenzie, 2007). They issue and sustain claims; in fact this might be identified as the essence of banking. The claims that banks issue can be invested with properties that allow activities that would not otherwise be possible. Claims on the commercial bank come to act as money, allowing efficiency in the use of money and the collection and on-lending of idle money. This claim that can act as money allows production of surplus value which otherwise would not be possible. Securities as a claim to the income of the borrower, made liquid by the markets that securities dealers make, also make possible the production of additional surplus value through collecting and lending-on otherwise idle money.

Derivatives claims allow the trading of things that otherwise could not be traded because they do not require the actual exchange of the underlying asset; instead, they reference an index, which must be external to and agreed upon by the counterparts. So as part of making these markets, banks have to make what they are going to trade. Banks make their own indices to serve as an underlying reference price to the derivative. The largest and fastest-growing categories of derivative instruments, LIBOR instruments and CDS respectively (see Chapter 1), illustrate this perfectly.

LIBOR and its equivalents are measures, calculated mostly by private associations of bankers, that calculate an average (excluding outliers) of where banks say they think they can borrow from each other. No trades need to have actually occurred in these instruments or at these prices. This measure, calculated by banks, is then used by banks to form the underlying reference price index for hundreds of trillions of US dollars of notional amounts of derivative transactions, overwhelmingly transacted among banks themselves and between banks and institutional investors. CDS, the fastest growing derivative instrument in the 2000s, continues to trade (even more overwhelmingly than other derivatives among only financial firms) as long as a panel of dealer banks and institutional investors decides that there has been no default. If they rule that there has been a default, trading ceases and outstanding trades are terminated and settled using an

auction process in which the principal participants are usually dealer banks and institutional investors. Banks make markets, and in derivatives markets they make them from top to bottom for themselves and for institutional investors.

In many ways cash settlement based on an external measure that participants cannot individually affect (an aleatory contract) makes the derivative more akin to a wager than to insurance. In an insurance contract, loss is specific to the insured party and must be proved or the specific insured item must be delivered to the insurer. Derivatives differ from wagering because the intention is to repeatedly buy and sell with the aim of profiting from price moves, while a wager is typically a 'take and hold' position. If, among other things, they were not using our money as money capital (explored further below) we might dismiss these markets as a zero-sum game between dealers and institutional investors.

Fourth, and finally, the derivative form that arises – the claim – entails a contradiction that in many ways acts as a limit or constraint to what otherwise appears to be a limitless process of growth with bigger trades on more things more often. As is often noted in this thesis, the derivative is an untraded claim to facilitate trading. The effect of this contradiction is mainly felt as a constraint to the growth of the market. Dealer's practices in derivatives markets stem to a large degree from their efforts to build market infrastructure to overcome these constraints, and it is only thanks to these efforts that the markets have grown as they have. Once again, the fact of dealers making derivatives markets for themselves shines through the analysis of these practices.

One form of constraint resulting from this contradiction is the counterparty risk contained in derivatives claims. For the market to keep growing, this risk must be mitigated. When banks made securities markets for borrowers and lenders they were paid, by both, out of the profits that their intermediation had made possible. By making a market for themselves, derivatives-market participants have cut themselves off from their source of profit; if they are not paid from the money capital of lenders or the profit that borrowers earn with their loans, they must be paid from each others' money capital. So before trading a derivative, each counterpart must assess whether the other can pay. To sell out of a derivative position means to trade a second derivative and a third, and so on, as I have

described in this thesis. If these contracts were to stand alone they would dramatically increase the counterparty credit risk. Banks have developed legal documentation to try to minimise the effects of this piling up of claims, and in doing so they maximise the number of derivatives for a given credit risk. In a further step, derivatives are subject to central clearing, on which more below.

The fact that banks make these markets for themselves also affects the other areas studied above. Valuation models and risk management practice generally assume that there is such a thing as 'the market'.[245] Starting with a category of the market and not asking how it is made, in practice or in theory, means that 'the models *of* the market do not include the models *in* the market'[246] (Holzer and Millo, 2005: 241). Any performativity of valuation models and risk management in the markets surely stems from a market made up of participants all assuming there is something called 'a market' with which they trade and which is not one made up of and made *by* themselves.[247] In fact, as Chapter 8 shows, the models are also very useful for overcoming a second constraint that arises from the contradiction: calculating what the next move in the market should be, i.e. trading calculations in the face of a growing mountain of (untraded) derivative claims and counterclaims.

Finally, banking regulation under the Basel Accords has also been shaped by the insular nature of derivative markets. Regulation by an international committee of national representatives lacks autonomy from those it regulates, and with it authority over them. It is unduly influenced by bank practices – what else could it be affected by? These markets, made by banks for banks, appear to have few participants outside financial institutions, so there is little sense in canvassing the opinions of outsiders about how they should be run. As a result, they reflect banks' practices in overcoming the problems and constraints of the piling up of

[245] Albeit they are now beginning to include assumptions about the market being more or less liquid at different times

[246] Lukás says of economics that it is 'a closed partial system. And this in turn is unable to penetrate its own material substratum, nor can it advance from there to an understanding of society in its entirety and so it is compelled to view that substratum as an immutable, eternal "datum". Science is thereby debarred from comprehending the development and the demise, the social character of its own material base' (Lukács, 1971: 105)

[247] Once again it seems that traders themselves, as opposed to their management and the back office, know this. This could be why Haug and Taleb (2011) rail against the models and can claim that 'Option traders use (very) sophisticated heuristics, never the Black-Scholes-Merton formula'.

derivatives claims and counterclaims resulting from the contradictory nature of derivatives.

Derivatives markets are somewhat insulated from the liquidity requirements of lenders and borrowers by the nature of institutional investors and of cash-settled derivatives. The most critical connection that remains with the rest of the economy is that banks and institutional investors, for the most part, do not use their own money to trade with. They must therefore continuously act to draw other people's money into these markets, as commercial banks must continuously act to sustain their liabilities as bank credit money. Banking regulation duly sets out to convince liability holders that the risks of these activities are measured and controlled, that capital is set aside against them and that holding bank liabilities is safe as a result. Banks are making markets for themselves through regulation, too.

9.3 **Further research**

The inward-looking nature of derivatives markets explored in this analysis provides suggestions for further research looking outwards from derivatives markets and more fully investigating the relation of derivatives markets with the wider economy. The scope of analysis and the nature of derivatives markets presented here mirror one another in many ways, presenting an inward-looking view of derivatives markets and the bank practices therein. But part of the rationale for investigating these markets in the first place is their very large size in comparison to the broader economy (see Chapter1). These are not isolated practices on the margins of society; they have become a major part of advanced capitalism, not least through their role in the crisis that started in 2007/8.

One point of contact between derivatives markets and the broader economy arises from the spread of derivatives markets, made possible by cash settlement, to reference more and more aspects of daily life. This analysis has shown derivatives emerging from agricultural markets to become overwhelmingly financial, principally referencing the other financial claims that banks and institutional investors were holding and trading with each other. Yet cash-settled derivatives provide the bridge that allows these markets to reference, and influence through arbitrage, many other areas of society, e.g. commodity markets,

where cash-settlement allows new market participants and new trading practices. Cash settlement also allows derivatives on such things as natural disasters and seems likely to affect government policy as policy makers turn to market-based solutions to mitigate the cost of such events. Similarly cash settlement allows products such as GDP warrants, which have recently been issued by Greece and Argentina (Dizard, 2012a, 2012b). Having emerged from commodity markets and become financial, there now seems to be an overflowing of derivative and trading practices back into the real economy. In LiPuma and Lee's (2005: 409) terms: 'speculative capital emerges from existing forms of capital, first as its surplus and then as its competitor'.

The most pervasive and critical point of contact between derivatives markets and the rest of the economy, however, is that banks and institutional investors are using our money to make these markets in one way or another, whether we provide the money capital out of which they profit or pay for their losses. Further research might then investigate the ways in which banks and institutional investors profit in these markets using money drawn from the broader economy. This might include empirical comparison of returns to banks and institutional investors and returns to the providers of money capital. Similarly, and as a part of this, the ways in which the system appears to offer scant choice to individuals apart from becoming financialised might be investigated – which in turn raises questions about the links between politics and banks and the ways in which the growth of these markets appears to be associated with increased influence in political decisions.

Regulation, presented above as part of the mediation between banks and the broader economy, is an obvious site for further research looking outwards from derivatives markets and locating bank-based derivatives markets in the broader context of capitalism more generally. First, this might mean developing a more fundamental theory of bank regulation armed with a theory of banks. This in turn could provide some analysis of how society arrived at the derivatives markets that provide enormous returns to one part of the economy, largely from the money capital of others. As touched on above, this might include analysis of

financialisation, particularly of individuals, and more generally the links between the state, neo-liberalism and financialisation.

Much of the fragility of derivatives markets has appeared to come from banks' efforts to overcome the constraints imposed by the contradictory nature of the derivative form (the untraded claim to facilitate trading). The motivation for these efforts, by definition, is based in bank profits that stem from the growth of these markets; hence the prioritisation of growth over safety. As discussed in the thesis, if trading stops, these markets become unmanageable. Systemic risk and too-big-to-fail mean that the broader economy will bail out derivatives markets in such a situation. Regulation has repeatedly attempted to improve the safety of growing quantities of derivatives, but in doing so has only facilitated further growth. Further research might probe this problem and ask in particular if the move to central clearing is just another instance of this or marks a qualitative change that effectively makes derivative claims tradable. Moreover, it might go on to ask: 'What is the role of large but safe derivative markets?' Measures such as central clearing improve participants' safety and can be likened to improving road safety for Formula 1 drivers: putting in tyre walls, improving the surface and taking out the chicanes to allow faster speeds. But even if regulation protects the bystanders, it is legitimate to enquire into the purpose of such speed. Might it not be better to slow traffic down, putting in the equivalent of speed bumps, chicanes and speed cameras? Further still, might society not be better off with a pedestrian zone?

This thesis started with and has focused heavily on banks; finally, then, further research could also focus on banks. In the realm of regulation and policy it might ask what society should demand of its banks if they were not so busy making markets for themselves with our money.

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