

Subcontracting Linkages in India's Informal Economy

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ABSTRACT

Subcontracting relations have often been considered a key channel to facilitate growth in traditional informal enterprises and enable them to transition into larger, modern enterprises. Such relations are expected to strengthen with economic growth. Using nationally representative survey data for the Indian informal manufacturing sector, this article examines the nature and patterns of subcontracting linkages for informal family-based household enterprises over the high-growth period of 2001–2016. The article estimates the net accumulation fund (NAF) for these enterprises, which measures their ability to accumulate, and studies the transition possibilities of subcontracted enterprises over time. Results show that the NAFs of subcontracted enterprises remained much lower than those of non-subcontracted ones, with the disparity growing over the growth period. A vast majority of subcontracted household enterprises are embedded in relations that are akin to a traditional putting-out system, with little control over their production processes. Female-owned enterprises and those located within the household are more likely to be in such put-out relations. Average NAF for put-out household enterprises has been lower than for relatively autonomous subcontracted and non-subcontracted firms, although over time the gap in NAF between put-out and non-put-out firms, and thus their differential ability to transition, has narrowed. The prevailing nature of subcontracting relations in India's informal economy, even during the peak growth period, appears to be starkly different from the dynamic linkages that are celebrated in the literature as a channel for facilitating growth and transition.

INTRODUCTION

The informal economy in India continues to provide a livelihood to the vast majority of the country's working population. Work in the informal economy is generally characterized by low productivity, low remuneration and a lack of 'decent work' conditions (Bassier, 2023; Breman, 2010; Chen, 2006; La Porta and Shleifer, 2014). Dualist theories of economic development, following Lewis (1954), predict that economic growth will create more employment avenues in the formal sector, as well as better opportunities for informal sector firms, which may then become formalized over time. This process is expected to eventually result in a greater formalization

of the overall economic structure. However, despite the high growth experienced by the Indian economy for a sustained period of more than three decades, peaking in the 2000s, the dependence of its working population on informality has seen little change. This is also true for the manufacturing sector, which is expected to be the driver of transformation processes on account of its strong backward and forward linkages (Storm, 2015; Tregenna, 2009).

Various interventions, such as strengthening the availability of credit for informal firms, providing them with better market access, and supporting human resource development for informal firm owners by improving their managerial and marketing skills, among others, have been considered in the literature as ways to aid the transition of informal firms into larger, more productive, formal firms (Hampel-Milagrosa et al., 2015; Murphy, 2007; World Bank, 2007). In this context, subcontracting linkages are expected to be one of the most important channels for facilitating such a transition by enabling better access to markets for informal firms and assisting a transfer of technology and entrepreneurial capabilities to them (Moreno-Monroy et al., 2014; Ranis and Stewart, 1999). It has been argued that if the formal sector exhibits robust growth and develops stronger subcontracting linkages with the informal sector, there would be an eventual crowding out of the low-productivity, subsistence-driven 'traditional' segment of the informal sector by the dynamic 'modern' segment, which would, in turn, become formalized over time.¹

However, during the recent period of high growth in the Indian economy, the incidence of subcontracting in the informal manufacturing sector fluctuated widely, falling from around 30 per cent in 2001 to 20 per cent in 2011 and then rising again to about 30 per cent in 2016. For the relatively larger modern enterprises, there has been a more pronounced and consistent fall throughout this period (discussed in detail below). Furthermore, subcontracted firms, on average, experienced lower productivity than non-subcontracted firms throughout the growth period, with the gap widening over time.

This raises questions regarding the *nature* of subcontracting linkages that have been prevalent in the Indian informal sector, how this nature has evolved over time with economic growth, and whether the linkages

1. 'Traditional' and 'modern' refer to the distinct segments that characterize the dual economic structure in the dualist literature (Lewis, 1954; Ranis and Stewart, 1999). The modern segment is argued to be driven mainly by the objective of profit maximization and accumulation, whereas the traditional segment is mainly driven by the subsistence needs of the households owning the enterprises. Modern enterprises are technologically more advanced, relatively more productive, and use a higher value of assets vis-à-vis their traditional counterparts. Borrowing from this literature, this article uses the term 'traditional' to denote petty household enterprises. These enterprises may, however, be created and reproduced within the contemporary economic context itself, rather than being the remnants of an archaic economic formation.

are of the dynamic kind that are likely to facilitate a transition of the informal firms. This article makes a specific intervention by examining this issue and exploring the characteristics of the informal household enterprises that participated in different types of subcontracting linkages during the period 2001–16. This period spans the peak phase of high growth in the Indian economy.² I focus on this period given the centrality of growth in facilitating a dynamic process of economic transformation.

The rest of the article is structured as follows. In the next two sections, I first engage with the existing literature on the nature of subcontracting linkages in the informal sector, and their expected role in facilitating a transformation of this sector, and then briefly discuss the data and the definitions used in this study. The following section then maps the evolution of subcontracting linkages and discusses the characteristics of subcontracted enterprises over the growth period. Building on some earlier works, a variable is constructed — the net accumulation fund (NAF) — which is a proxy for the ability of an informal firm to accumulate, grow and transition over time. Based on this, a comparison is made between the accumulation possibilities of subcontracted and non-subcontracted firms over the growth period. This analysis is then used to examine the nature of subcontracting linkages in the informal sector, and whether these linkages are of the kind that are likely to facilitate a transition of the informal enterprises. I classify different types of linkages (put-out and non-put-out), explore how they vary with specific enterprise characteristics, and investigate to what extent the differences in NAFs for enterprises embedded in different types of linkages are explained by these characteristics. The concluding section summarizes the arguments presented in the article.

SUBCONTRACTING LINKAGES AND ECONOMIC TRANSFORMATION

A less developed economy is often characterized by a dual economic structure that manifests itself in terms of the coexistence of a large, traditional, subsistence-driven, non-capitalist sector, which provides employment to a majority of the workforce, and a relatively small modern, productive, formal capitalist sector (Gollin, 2014; Lewis, 1954; Syrquin, 1988). In this context, economic development is often visualized as a transformation of such a dual economy into a homogeneously modern structure entailing a transition of the traditional/pre-capitalist/informal sector into a modern/capitalist/formal sector through economic growth, along the lines of the advanced capitalist

2. Economic growth in India began to falter from 2016 onwards, particularly with the economic shock of demonetization in November 2016, and then later with the COVID-19 pandemic that took hold in 2020.

economies (ibid.; see also La Porta and Shleifer, 2014; McMillan et al., 2017; Tignor, 2004).

The Indian economy, in which about 80 per cent of the workforce is employed in the informal economy, is often viewed as a classic example of such a dual economy (Basole, 2022; CSE, 2018). The informal economy comprises both informal enterprises and informal wage workers. There have been long-standing debates in the literature on both the character of the informal economy and its relationship with the growth process. In some parts of the literature, the informal sector is seen as comprising dynamic, micro-entrepreneurial, risk-taking enterprises, often operating at similar productivity levels as the formal firms, that can act as drivers of the growth process (De Soto, 1989; Maloney, 2004; Ulysea, 2018). The proportion of informal micro-enterprises exhibiting dynamic entrepreneurial characteristics is often constrained by the lack of a conducive business environment and limited access to avenues for human capital formation (Grimm et al., 2012). Others, however, view the informal economy as distress-driven and backward in nature, absorbing the excess labour force in the economy (Chen and Carré, 2020; Donovan et al., 2023; La Porta and Shleifer, 2014).

Much of the scholarship on informality, spanning both these contending views, argues that with economic growth the productivity and scale of informal firms can be enhanced, and their transition process facilitated, by institutionalizing measures such as enabling technology transfer and skills to the informal firms, improving their credit access, and integrating them with the larger, formal firms via subcontracting linkages (Guha-Khasnobis et al., 2006; Khan, 2019; Muralidharan et al., 2021). This view is, however, contended by a recent strand, following Sanyal (2007), which posits that the persistence of informality and of non-dynamic, subsistence-driven enterprises is rather an outcome of the contemporary growth process. It is argued that while the growth process dispossesses workers from the traditional/non-capitalist segment, it does not absorb them into the expanding capitalist segment, rendering many of them redundant or surplus for the process of capitalist growth and accumulation. To secure its livelihood conditions, this surplus population is forced to continually reproduce subsistence-driven informal economic activities (Bhattacharya, 2017; Bhattacharya and Kesar, 2020; Chakrabarti, 2016).

It has also been noted in the literature that the informal economy in India cannot be characterized as a homogeneous formation (Fields, 1990; Ghose, 2006; Kesar, 2023). One can identify an economic dualism between traditional and modern segments even within the informal manufacturing sector. The traditional segment comprises the own-account manufacturing enterprises (OAMEs), which are typically low-productivity, non-capitalist, petty-commodity production units that carry out production using only unpaid family labour without any hired workers. They are referred to in this article

as ‘household enterprises’. The modern segment is comprised of what I call ‘establishments’ — small-scale capitalist enterprises that are relatively more dynamic and micro-entrepreneurial, employing at least one hired worker.³ There is a stark difference between these modern and traditional segments in terms of their average productivity, value of assets, location, access to market, and other enterprise characteristics (Bhattacharya and Kesar, 2018, 2020; Kesar and Bhattacharya, 2020). For example, data from the National Sample Survey Office (NSSO) on unincorporated enterprises in India suggest that the median gross value added (GVA) per enterprise for the establishments in the informal manufacturing sector in 2015–16 was more than eight times higher than for the household enterprises. Such household enterprises comprise 85 per cent of the informal manufacturing sector, while the establishments comprise the remaining 15 per cent. These proportions remained unchanged over the entire 2000–16 period. Studies have also found that during this growth period, economic dualism between these two segments of the sector has become even more entrenched (*ibid.*).

This dualism can be diluted if enterprises in the traditional segment of the informal sector are able to grow and transition into more dynamic and productive modern enterprises. As noted above, the role of subcontracting linkages in facilitating such a transition has been widely recognized in the literature. Moreover, such linkages are often expected to become stronger with higher economic growth (Arimah, 2001; Chen, 2006; Meagher, 2013; Ranis and Stewart, 1999). This view, which has been characterized as the ‘benign’ view by Basole et al. (2015), argues that if there is high growth in the formal sector, and if the informal sector — particularly the modern segment — has stronger linkages with the formal sector, the informal enterprises will be able to grow and generate higher income, and help unleash the entrepreneurial potential of the informal firms (Arimah, 2001;

3. The capitalist and non-capitalist enterprises are distinguished in terms of the presence or absence of capital–wage labour relationships within the enterprises as well as the economic logics that govern the enterprises. The household enterprises (OAMEs) in India are usually subsistence-driven enterprises that are unable to retain sufficient funds for accumulation and further expansion, whereas establishments are able to retain such funds, albeit at a small scale (Bhattacharya and Kesar, 2018, 2020). Furthermore, for household enterprises the economic logic of the enterprise and the consumption logic of the household owning the enterprise are closely enmeshed and cannot be strictly separated, whereas for the establishments, these two aspects are often distinct: see Berner et al. (2012), Bhattacharya et al. (2013), Chakrabarti (2016), Harriss-White (2014), Moser (1978) and Sanyal (2007) for characterizations of dualism between the traditional and modern economic spaces. However, the subcontracted household enterprises, whose production processes are integrated with larger capitalist firms through subcontracting linkages and are subsumed under their operational logic, cannot be characterized to be non-capitalist in nature. I discuss these enterprises in more detail later in the article. Note that less than 30 per cent of the informal manufacturing firms in India are integrated into subcontracting linkages, while the rest (more than 70 per cent) are not.

Böhme and Thiele, 2014; Dolan and Scott, 2009; House, 1984; Ranis and Stewart, 1999). It has also been argued that if there are vertical linkages between the formal sector and the modern informal sector, then, with trade liberalization, there will be an increase in employment and wages in the informal firms due to a flow of capital from the formal to the informal sector (Marjit, 2003; Marjit and Maiti, 2006).⁴ In the Indian context, some studies find evidence of a positive relationship between the incidence of subcontracting by the formal sector and employment generation in the relatively 'modern' segment of the informal sector (Moreno-Monroy et al., 2014), while others find a complementary relationship between formal and informal parts of an industry that can be explained on the basis of agglomeration externalities and production outsourcing by formal firms (Sundaram et al., 2012).⁵

In contrast to the benign view, the 'exploitation' perspective sees these subcontracting linkages as primarily a cost-cutting strategy of the larger or formal firms, taking advantage of low wages in the informal enterprises. This view argues that a parent firm is more likely to subcontract to less productive and smaller informal enterprises in order to take advantage of the asymmetric bargaining power between parent and subcontracted firms. Moreover, such subcontracting linkages generally do not involve a transfer of technology or entrepreneurial capabilities from the former to the latter. Rather, these linkages are mostly exploitative in nature, which might further worsen the economic conditions of the subcontracted enterprises (Bremar, 2010; Elyachar, 2012; Moser, 1978; Portes, 1994; Sanyal, 2007; Tokman, 1978). Some earlier work in the context of the Indian formal manufacturing sector, such as Bose (1990) and Ramaswamy (1999), also highlighted the power asymmetries in such relations and pointed to the parent firm's ability to access cheap labour as one of the key drivers for these linkages. More recent studies exploring specific cross-sections of data between 2001 and 2011 find that non-subcontracted, family-based, informal manufacturing enterprises have performed better than subcontracted ones in terms of productivity and earnings (Basole et al., 2015; Bhattacharya et al., 2013; Raj and Sen, 2016; Sahu, 2010). Basole et al. (2015) find that informal manufacturing enterprises displaying particular characteristics that are associated with low productivity — such as being home-based, poorly endowed (in terms of asset availability) and female-headed — are more likely to enter into subcontracting relations. However, given the heterogeneity in the Indian informal sector, they find evidence of both benign and exploitative subcontracting relations. While enterprises that are smaller, located in rural areas

4. This argument has been critiqued for its inability to explain the mechanism of such capital flow (Siggel, 2010).

5. Uchikawa (2011) also finds evidence of a positive impact of subcontracting, but shows that most of this subcontracting is limited to the organized sector since the unorganized sector enterprises are not technologically developed enough to take advantages of such linkages.

and in industrially backward states are more likely to enjoy a subcontracting premium and to benefit through this process, for enterprises that are bigger, located in urban areas and in industrially advanced states the process has been less beneficial (*ibid.*).

There have thus been some important empirical interventions on subcontracting relations in the informal economy in India. However, this literature does not directly engage with the issue of the *nature* of subcontracting linkages at the pan-India level spanning all industry groups in the informal manufacturing sector, and the implications thereof for facilitating a transition of the subcontracted informal firms. This article attempts to take up this task. It begins by examining the transition possibilities of the subcontracted informal household enterprises, or OAMEs, over periods of economic growth, and then, to make sense of the results, presents a detailed analysis of the nature of linkages that are prevalent in the informal manufacturing sector.

While some of the literature summarized above, particularly the work of Basole et al. (2015), explores such transition possibilities, they have two shortcomings for our purposes. First, they provide a static analysis at a particular point in time, which is not suitable for analysing the possibilities of transition over time with economic growth. Second, they use GVA as a proxy to capture a firm's growth potential, which may not be entirely appropriate. The GVA of a family-based informal enterprise comprises two parts: (a) the amount that may be used by the firm to reinvest and grow; and (b) the amount that is retained for self-consumption by family labour working in the enterprise. To capture the firm's growth potential, this latter amount, (b), needs to be deducted from the GVA. Building on earlier works, I account for this and construct a variable, the net accumulation fund (NAF), which provides a better proxy for the ability of a firm to accumulate and grow (discussed in detail in the next section). Using the NAF, a later section will examine the growth and transition possibilities of subcontracted informal household enterprises during India's recent period of high economic growth (2001–16).

I develop this analysis to examine the core issue addressed in this article, that is, an analysis of the nature of subcontracting linkages. This calls for an appropriate characterization of different types of subcontracting relations, a study of how specific characteristics of informal enterprises are related to the types of subcontracting linkages they participate in, and an investigation into whether these linkages are of the kind that may facilitate a transition among subsistence-driven informal enterprises.⁶

6. An exploration of these issues may also help to explain why informal subcontracted enterprises are often found to be less productive than the non-subcontracted ones.

DATA AND DEFINITIONS

The analysis is based on four repeated cross-sections of enterprise-level data for the unorganized manufacturing sector from NSSO survey rounds for 2000–01 (56th round), 2005–06 (62nd round), 2010–11 (67th round) and 2015–16 (73rd round). This covers the peak of the high-growth period spanning the past three decades in India. The 73rd round of the NSSO survey (2015–16) is the latest available pan-India survey on informal enterprises.⁷ I specifically focus on the OAMEs, as these household enterprises comprise by far the largest part of the traditional, non-capitalist segment of the informal manufacturing sector. I use an internationally comparable definition of the informal sector provided by the National Commission for Enterprises in the Unorganised Sector (NCEUS) in the Indian context: ‘The unorganized [informal] sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers’ (NCEUS, 2007: 48). The NSSO dataset includes some relatively large enterprises that may not be household enterprises. For my analysis I exclude the enterprises that do not conform to the NCEUS definition.⁸ NSSO defines subcontracting as an ‘industrial activity whereby one enterprise (big enterprise/contractor) hires/contracts another enterprise (the smaller enterprise/subcontractor) to produce parts, components, sub-assemblies or assemblies, the product of which is marketed by the contractors or marketed to contractors for further value addition’ (NSSO, 2010: C10). For the analysis, all monetary values have been inflated to 2015–16 price levels, using the Index of Industrial Production deflator series for the unorganized manufacturing sector. For estimations based on the sample data, I apply the sampling weights provided by the NSSO.

Next, following Bhattacharya (2017) and Kesar and Bhattacharya (2020), I construct a variable, the net accumulation fund, which, as mentioned above, is a proxy for an enterprise’s ability to grow and expand over time. NAF is the fund retained by an enterprise *after* accounting for various costs, making payments such as wages, rent and interest, and setting aside an amount for consumption by the working owners and unpaid family labour working in the enterprise. This fund can be used by an enterprise to accumulate, reinvest and reproduce itself as a productive firm on an expanded scale. NAF for an enterprise can, therefore, be represented as: [GVA (i.e., receipts

7. The structure of the data is that of repeated cross-sections rather than a panel. Given that the survey design has remained consistent throughout the period under consideration, I am able to make comparisons of the average estimates over time.

8. For the four time points over the period 2000–16, around 95–98 per cent of estimated population (or around 92–96 per cent of the sample) of unorganized enterprises from the NSSO surveys conform to the NCEUS definition.

– expenses)] minus [wages paid to the hired workers + rent + interest + amount retained for consumption of the working owners and the household workers].

The NSSO provides data on all these variables except the amount retained by the household enterprises for consumption by working owners and unpaid family labour working in the enterprise, that is, workers who are not formally hired and, therefore, for whom no wage payments are reported (data are available for the total number of working owners and unpaid family labour for each enterprise). This implies that for the informal sector enterprises, especially household enterprises which mainly operate with working owners and family labour, the NAF cannot be directly obtained from the data. Instead, the consumption fund set aside for the working owners and family labour working in the enterprise needs to be estimated separately. However, this estimation is not straightforward. A unique feature of the informal enterprises (particularly household enterprises) is an overlap between the production space of the enterprise and the consumption space of the household (Bhattacharya et al., 2013; Sanjal, 2007). Given this overlap, the amount retained for consumption by the household workers and the amount retained for reinvestment in the enterprise cannot be strictly delineated. In other words, the entire fund retained by the enterprise, after making various explicit payments, is the net earnings retained by the household. These earnings comprise both the consumption fund for the working owners and unpaid family workers and the fund for reinvestment in the enterprise for possible expansion. The household can use this amount to augment consumption or to reinvest in varying proportions.

For an establishment which employs at least one hired worker, the average wage per hired worker is multiplied by the total number of workers in that establishment (including the unpaid working owners and non-hired workers) to get an estimate of the consumption fund. To reach an estimate of the potential consumption fund for the household enterprises which do not employ any hired workers, I match the household enterprise to a similar establishment, and impute for the family labour and working owners a pseudo wage based on the earnings of the wage workers working in a ‘similar’ informal enterprise that hires wage labour. The matching is carried out in terms of four characteristics: GVA, location/sector (rural or urban), state zone (East, West, North, South, Northeast or Central India), and the broad industry type, based on the National Industrial Classification Code which gives a total of 16 industry types in the manufacturing sector (Table 5 later in the article lists the industry groups). To do this matching, for each of the four time points (2000–01, 2005–06, 2010–11 and 2015–16) I regress the average wage per hired worker for the establishments on these four characteristics. This allows us to estimate a vector of coefficients that captures the relation of the selected characteristics to the average wage per worker

Table 1. Distribution of Net Accumulation Fund (NAF) for Household Enterprises (at 2015–16 Prices in INR)

NAF	2000–01	2005–06	2010–11	2015–16
Mean	843	500	1801	1908
P10	–1046	–1557	–901	–1103
P25	–399	–635	–31	–216
P50	349	58	995	843
P75	1576	1163	2735	3088
P90	3253	2922	5357	6479

Notes: The left-hand column provides the percentiles (P) of the distribution.

For 2015–16, the average number of total workers in the household enterprises, i.e., the OAMEs (including the working owners and family labour working in the enterprise) is 1.3. These enterprises do not hire any wage workers. The average number of hired workers in establishments is 2.4, and the mean number of total worker (including the working owners or any family labour working in the enterprises) is 3.4.

Source: Author's calculations using 56th (2000–01), 62nd (2005–06), 67th (2010–11) and 73rd (2015–16) rounds of NSSO survey data.

for the establishments. I then use this vector to predict pseudo wages for the household enterprises.

This imputed pseudo wage can be viewed as a return for the work undertaken by working owner and family labour working in the enterprise, who would have been paid wages if they were hired as wage workers.⁹ The pseudo wage per worker is multiplied by the total number of workers in a household enterprise to reach an estimate of its consumption fund. This consumption fund for working owners and non-hired family labour is then deducted from the GVA of the enterprise, along with payments for rent and interest, to estimate the NAF of the household enterprise.¹⁰ Unlike GVA, NAF provides a direct proxy for an enterprise's ability to expand and possibly transition into a larger and more dynamic enterprise. The distribution of monthly NAF for household enterprises at each of the four time points is reported in Table 1.

9. I am interested in estimating the amount that the enterprise can *potentially* retain for accumulation after keeping aside a fund for self-consumption by working owners and family labour. This amount can, in reality, be higher or lower than what I calculate. However, I estimate a benchmark based on what the enterprise could retain if they were to pay wages to family labour if they were working as a wage worker. I expect this to be an underestimation of the consumption fund (and hence an over-estimation of the NAF), since estimates based on the nationally representative India Human Development Survey data suggest that, on average, households deriving their primary income from self-employed enterprises have a higher income than those deriving their primary income from informal wage work (Kesar, 2023). This, as I show later, only makes our results stronger.

10. For an enterprise that operates by employing only wage workers, this issue of delineating consumption and accumulation funds does not arise. For them, the amount left after making the explicit payments, including wages, can be used as accumulation fund (or net profit) of the enterprise, since no additional amount needs to be deducted for self-consumption of family labour.

Table 2. Incidence of Subcontracting in Rural and Urban Areas (percentages).

Enterprise type	Rural				Urban			
	2000–01	2005–06	2010–11	2015–16	2000–01	2005–06	2010–11	2015–16
Household enterprises	28.05	31.25	25.01	35.01	38.81	34.54	17.48	28.63
Establishments	21.51	22.51	9.86	16.11	35.24	30.57	9.89	24.32
All Enterprises	27.62	30.61	23.7	33.52	37.82	33.4	15.66	27.63

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

SUBCONTRACTING LINKAGES AND POSSIBILITIES OF TRANSITION

In this section, I briefly describe the evolution of subcontracting linkages and the characteristics of subcontracted household enterprises in the informal manufacturing sector over India's period of high economic growth (2001–16) and, using the NAF, study the role of these linkages in facilitating a transition of the traditional segments of the sector.

Characteristics of Subcontracted Household Enterprises and their Evolution

As noted above, the incidence of subcontracting within the informal manufacturing sector fluctuated across the high-growth period of 2001–16, falling from 30 per cent in 2000–01 to 20 per cent in 2010–1, and then climbing back to 30 per cent by 2015–16. Within this overall trend, there were some variations for different sets of enterprises. For the rural sector, the incidence of subcontracting fell from 28 per cent in 2000–01 to 24 per cent in 2010–11 but then rose to 34 per cent in 2015–16, while for the urban sector it fell from 38 per cent in 2000–01 to 16 per cent in 2010–11 and then rose to 28 per cent in 2015–16 (Table 2). Furthermore, between 2001 and 2016, the incidence of subcontracting has risen only among rural household enterprises, while for all other sets of informal enterprises, i.e., for urban household enterprises and for rural and urban establishments, the incidence has fallen. As noted above, this analysis focuses on OAMEs (both rural and urban) since they comprise the set of traditional, non-capitalist, family-based household enterprises.

I explore how the incidence of subcontracting may be related to different enterprise characteristics. Certain characteristics such as being located outside the household (which provides better access to markets), being headed by a male (given the broader patriarchal socio-cultural structure), and having more assets available, have been identified in the literature as favourable, since enterprises with these characteristics are likely to have higher GVAs (Basole et al., 2015; Chen, 2006; Monroy-Moreno et al., 2014; Raj and Sen, 2016; Sethuraman, 1998). Our preliminary exploration suggests that

Table 3. Enterprise Characteristics of Subcontracted (S) and Non-subcontracted (NS) Household Enterprises (HH enterprises)

Enterprise characteristic	2000–01		2005–06		2010–11		2015–16	
	NS	S	NS	S	NS	S	NS	S
Percentage of female-headed HH enterprises	21.49	47.9	30.1	65.01	38.63	69.17	41.91	72.21
Percentage of HH enterprises located outside the household	28.49	10.36	24.92	7.38	24.45	5.05	25.3	7.27
Median value of assets per worker (INR)	16,789	13,427	21,136	10,630	55,043	24,708	100,150	42,650

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

a higher proportion of household enterprises associated with relatively unfavourable and weaker characteristics are likely to enter subcontracting relations. I find that in 2015–16, 25.3 per cent of non-subcontracted household enterprises were located outside the household, while only 7.3 per cent of subcontracted household enterprises were similarly located (Table 3). Similarly, while 41.9 per cent of non-subcontracted enterprises were female-headed, the corresponding figure for subcontracted enterprises was 72.2 per cent. The non-subcontracted household enterprises also have a much higher median value of assets per worker than the subcontracted ones, with the difference rising steadily from about 1.3 times in 2000–01 to 2.4 times in 2015–16.¹¹

To more clearly explore how the likelihood of subcontracting in household enterprises varies with each enterprise characteristic, while controlling for other characteristics, I estimate the following equations using a logit maximum likelihood estimation:

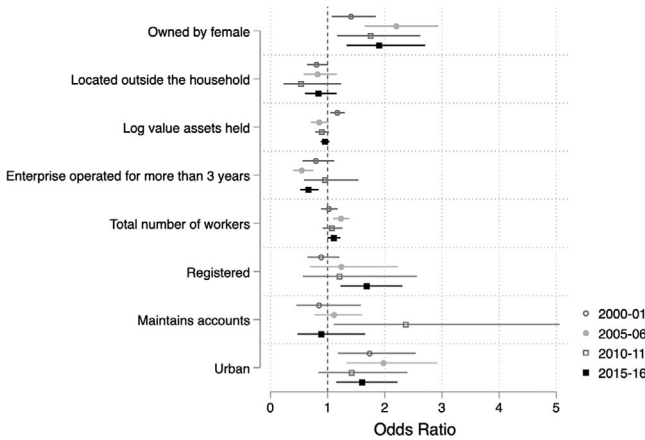
$$\Pr(\text{subcontract}_t = 1) = F(\beta_{0t} + \beta_{1t}\mathbf{X}_{it} + \mu_{it}), t = 2000 - 01, 2005 - 06, 2010 - 11 \text{ and } 2015 - 16 \quad (1)$$

$$\Pr(\text{subcontract} = 1) = F(\beta_0 + \beta_1\mathbf{X}_i + \beta_2t + \mu_i), \quad (2)$$

The dependent variable in each of the specifications is a binary variable, which takes value 1 if the firm is subcontracted and 0 if the firm is not subcontracted. A logit function models the probability of occurrence of the event (in this case being subcontracted) as a linear combination of

11. All values are reported in Indian rupees (INR) unless stated otherwise. For reference, the average currency conversion rate at PPP (INR/USD) for the years 2015 and 2016 was INR 19.62 (19.24 for 2015 and 19.99 for 2016) (OECD, 2023). I use this conversion rate for all INR to USD conversions in the text.

Figure 1. Likelihood of Being Subcontracted by Enterprise Characteristics (by time): Plotted Coefficients from Table 4



Notes: Logit maximum likelihood estimation, with binary dependent variable model. Dependent variable is a binary dependent variable: subcontracted = 1, not subcontracted = 0. Regressors include gender of the head of the household (with non-female as the reference category), location of the household (within or outside the household, within the household being the reference category), log value of assets owned or hired, age of the enterprise (less or more than 3 years, with less than 3 years as the reference category), total number of workers, registration status (with not being registered as the reference category), accounts maintenance (with not maintaining accounts as the reference category), time, sector (rural/urban; with rural as the reference category), industry groups and state zones. Odds ratio reported. Clustered robust standard errors, clustered at state levels.

Source: Author’s calculations using 56th (2000–01), 62nd (2005–06), 67th (2010–11) and 73rd (2015–16) rounds of NSSO data.

the independent variables (X), and I fit the logit model for the binary response (subcontracted or not subcontracted) using maximum likelihood estimation. X is a vector of enterprise characteristics that includes the following: gender of the enterprise owner, whether the enterprise is located within or outside the household space, log value of assets held, whether the enterprise has operated for more or less than three years, total number of workers in the enterprise, whether the enterprise is registered or not, whether the enterprise maintains accounts or not, rural versus urban location of the enterprise, industry groups, and state-zone controls. Simply put, I estimate how the probability of being subcontracted varies with these various enterprise characteristics. Specification 1 is estimated separately for each time point, thereby estimating the time-specific relation between enterprise characteristics and the likelihood of being subcontracted. Specification 2 estimates the average relation over all four time points, with additional time controls to account for any time-specific heterogeneity. I report the odds ratios from Specification 1 in Table 4 and Figure 1, and from Specification 2 in Figure 2. An odds ratio > 1 suggests a positive relation between an enterprise characteristic and the likelihood of being subcontracted, and an odds ratio < 1 suggests a negative relationship. For a categorical regressor

Table 4. Likelihood of Being Subcontracted: Maximum Likelihood Logit Estimation (odds ratio reported)

	2000–01 Subcontracted (Reference: not subcontracted)	2005–06 Subcontracted	2010–11 Subcontracted	2015–16 Subcontracted
Female-headed enterprise (Reference: non-female-headed)	1.405*** (2.46)	2.200*** (5.35)	1.749*** (2.70)	1.898*** (3.55)
Located outside household (Reference: Located within HH)	0.803* (-1.90)	0.820 (-1.12)	0.532 (-1.47)	0.836 (-1.08)
Log of value of assets held (in INR)	1.166*** (2.81)	0.850* (-1.75)	0.895 (-1.62)	0.953 (-1.20)
Operated more than 3 years (Reference: less than 3 years)	0.791 (-1.34)	0.543*** (-3.74)	0.951 (-0.21)	0.662*** (-3.38)
Number of workers	1.020 (0.27)	1.230*** (3.49)	1.072 (0.85)	1.105* (1.91)
Enterprise registration (Reference: Unregistered)	0.884 (-0.78)	1.237 (0.71)	1.204 (0.48)	1.681*** (3.21)
Account maintained (Reference: not maintained)	0.846 (-0.52)	1.111 (0.56)	2.365*** (2.22)	0.885 (-0.38)
Urban (Reference: rural)	1.731*** (2.80)	1.975*** (3.42)	1.417 (1.30)	1.599*** (2.80)
Industry: Tobacco products (Reference: Food and beverages)	295.2*** (17.35)	48.73*** (8.56)	85.06*** (15.74)	79.41*** (16.67)
Wearing apparel	6.064*** (6.15)	3.257** (2.20)	3.444*** (2.09)	1.596 (0.88)
Leather and related products	8.283*** (7.58)	16.03*** (5.78)	14.58*** (5.81)	18.08*** (6.09)
Wood and wood and cork products*	4.079*** (5.02)	2.052** (2.17)	0.617 (-1.13)	1.712** (2.24)
Paper and paper products	14.41*** (8.99)	37.86*** (3.34)	7.916*** (6.62)	6.309*** (4.35)
Printing and reproduction of recorded media	12.62*** (10.07)	13.03*** (8.40)	8.159*** (2.75)	4.511*** (3.33)
Chemicals, pharmaceuticals, medicinal products*	106.2*** (10.94)	85.54*** (6.92)	18.35*** (3.21)	7.124*** (6.49)
Rubber, plastics, glass, other non-metallic mineral products	2.518*** (3.11)	3.273*** (3.50)	3.450* (1.89)	10.41*** (7.14)
Coke/refined petroleum products, basic/fabricated metal products	6.111*** (8.51)	7.129*** (4.64)	4.365*** (3.18)	2.780*** (2.59)
Computer, electronic and optical products, electrical equipment	16.84*** (6.94)	5.376*** (2.94)	1.443 (0.73)	51.35*** (6.70)
Machinery and equipment n.e.c., motor vehicles, repair*	5.022*** (4.72)	9.449*** (4.23)	2.154 (1.08)	1.582 (0.95)
Furniture and other manufacturing	15.09*** (13.09)	13.19*** (8.43)	11.32*** (3.91)	8.452*** (6.53)

(Continued)

Table 4. (Continued)

	2000–01 Subcontracted (Reference: not subcontracted)	2005–06 Subcontracted	2010–11 Subcontracted	2015–16 Subcontracted
Water/waste collection, sewage, treatment, materials recovery	24.54*** (9.46)	0.316 (-1.08)		0.310 (-2.89)
Textiles	43.24*** (16.41)	39.51*** (10.25)	47.79*** (9.89)	23.71*** (11.36)
State zone controls	Y	Y	Y	Y
Observations	145558	53116	62719	46799
Adjusted R2	38.40%	36.32%	44.34%	43.51%

Notes: Exponentiated coefficients; t statistics in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

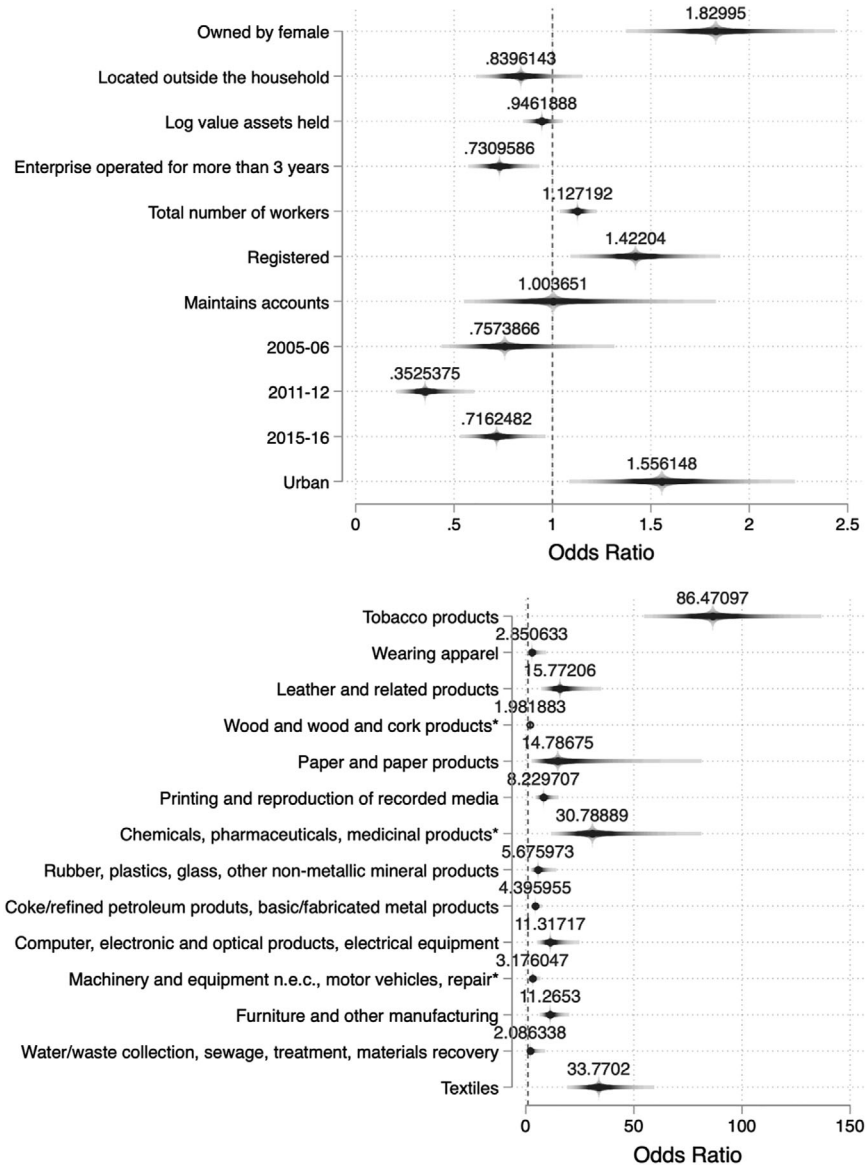
Reference denotes the reference category of the variable.

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

in **X**, the odds ratio denotes the odds of an enterprise with non-reference characteristics being subcontracted vis-à-vis the reference category, while for a continuous variable the odds ratio denotes the change in odds of being subcontracted with an increase in value of the variable by one unit.

I find that, on average, controlling for other characteristics as well as state-zone and time-invariant heterogeneities, the likelihood of being subcontracted varies most strongly with the gender of the enterprise owner, rural/urban location and duration of operation, as well as with different industry groups. On average, in the pooled sample, female-headed enterprises are 1.8 times more likely than non-female-headed enterprises to enter into subcontracting relations (Figure 2). This likelihood has increased over time, from about 1.4 times in 2000–01 to 1.9 times in 2015–16 (Table 4). Similarly, on average over the four time points, enterprises located in urban areas are 1.6 times more likely than those in rural areas to be subcontracted (Figure 2). This time-specific relation is statistically significant for three of the four time points, with odds ranging between 1.6 and 2 times (Table 4). Over the period, on average, firms operating for less than three years were 0.7 times less likely than those operating for longer than three years to enter subcontracting relations, *ceteris paribus* (Figure 2). This relation is statistically significant for two of the four time points (Table 4). For the rest of the characteristics, the relation is either not statistically significant or is significant only for one of the four time points. For example, registration status is statistically significantly (and positively) related to the likelihood of being subcontracted only for 2015–16 (Table 4). From the above, one might argue that firms that are less likely to have developed access to the market are more likely to enter subcontracting

Figure 2. Likelihood of Being Subcontracted by Enterprise Characteristics



Notes: Logit maximum likelihood estimation, with binary dependent variable model. Dependent variable is a binary dependent variable: subcontracted = 1, not subcontracted = 0. Regressors include gender of the head of the household (with non-female as the reference category), location of the household (within or outside the household, within the household being the reference category), log value of assets owned or hired, age of the enterprise (less or more than 3 years, with less than 3 years as the reference category), total number of workers, registration status (with not being registered as the reference category), accounts maintenance (with not maintaining accounts as the reference category), time, sector (rural/urban; with rural as the reference category), industry groups and state zones.

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

relationships. For example, female-owned enterprises are likely to be in relatively disadvantageous positions in terms of their ability to access market networks, given the dominant patriarchal social norms, including those that make them more prone to be located within the household space. Similarly, enterprises that have been operational for a shorter duration of time (less than three years in this case) are less likely to have well-developed market networks.

Among the six major industry groups in the informal manufacturing sector — apparel, tobacco products, textiles, food and beverages, furniture and other manufacturing, and wood and cork products — which together account for about 87 per cent of the sector and 90 per cent of all household enterprises in the informal manufacturing sector, the incidence of subcontracting, that is, the proportion of household enterprises in an industry group that are subcontracted, has been particularly high in tobacco products and textiles. For example, in 2015–16, 85 per cent and 59 per cent of household enterprises in these sectors, respectively, were subcontracted (Table 5). This is also captured in the regression analysis, with both these sectors having very high odds of being subcontracted. Other manufacturing industry groups, such as leather and related products, rubber and plastic products, chemical, pharmaceutical and related products, and computer, electronic and optical products, also experienced high incidence of subcontracting, but they account for a very small proportion of the total enterprises in the informal sector. I control for any industry-specific effects in the regression analysis throughout the article.

Subcontracting Linkages and the Potential for Transition

The next step in the analysis is to compare the NAFs of subcontracted and non-subcontracted firms over time, which captures their possibilities to accumulate and grow. The average NAF of non-subcontracted household enterprises is much higher than that of the subcontracted ones (Table 6). For example, in 2015–16, the mean monthly NAF of non-subcontracted household enterprises was INR 2,427 (approximately US\$ 124), while that of subcontracted household enterprises was INR 846 (approximately US\$ 43). Further, over the period of analysis, this difference in the NAF has risen steeply, with the ratio of NAF of non-subcontracted and subcontracted household enterprises rising from 1.2 to 2.9. This trend has been similar across the quantiles of NAF distribution of household enterprises (Table 6). This shows that subcontracted household enterprises have lagged further behind their non-subcontracted counterparts during the growth period, and also indicates that subcontracted household enterprises had a reduced possibility for transition compared to non-subcontracted ones.

Table 5. Industry Classification of the Subcontracted Enterprises

	Percentage subcontracted among each industry			
	2000–01	2005–06	2010–11	2015–16
Manufacture of food products and beverages	3.38	3.46	1.56	4.8
Manufacture of tobacco products	90.47	70.8	72.02	84.62
Manufacture of textiles	54.31	61.65	44.25	59.22
Manufacture of wearing apparel	16.7	12.16	5.25	7.99
Manufacture of leather and related products	18.34	33.3	13.78	40.34
Manufacture of wood and of products of wood and cork, except furniture	10.55	8.07	1.22	9.38
Manufacture of paper and paper products	42.7	70.58	21.66	45.9
Printing and reproduction of recorded media	35.3	29.66	9.27	18.53
Manufacture of chemicals and chemical products, pharmaceuticals, medicinal chemical and botanical products	76.63	81.43	27.01	41.74
Manufacture of rubber, plastics products, glass, and other non-metallic mineral products	7.58	9.61	5.12	34.66
Manufacture of coke and refined petroleum products, basic metals, fabricated metal products, except machinery and equipment	16.46	16.21	5.84	8.46
Manufacture of computer, electronic and optical products, electrical equipment	39.66	12.3	1.27	54.52
Manufacture of machinery and equipment n.e.c., motor vehicles, trailers and semi-trailers, other transport equipment; repair of machinery and equipment	14.02	18.36	2.36	4.2
Manufacture of furniture and other manufacturing	32.07	30.19	15.43	26.44
Electricity, Gas, Steam and Air-condition Supply				0
Water collection, sewage, waste collection, treatment, materials recovery	47.45	0.71		1.85
Total	30.71	32.01	22.27	32.65

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

An estimate of the impact of subcontracting linkages on a firm's NAF, controlling for other enterprise characteristics, would need to account for endogeneity biases, especially for those that arise from the fact that a firm's

Table 6. NAF Distribution for Subcontracted and Non-subcontracted Household Enterprise across Quantiles (real monthly values in INR at 2015–16 prices)

Household enterprise	Non-Subcontracted (NS)				Subcontracted (S)				Difference (NS-S)			
	2000–01	2005–06	2010–11	2015–16	2000–01	2005–06	2010–11	2015–16	2000–01	2005–06	2010–11	2015–16
NAF	889	559	2040	2427	739	374	968	846	150	185	889	559
Mean	-1169	-1798	-1001	-1214	-716	-883	-579	-837	-453	-916	-1169	-1798
P10	-514	-817	-91	-200	-157	-401	137	-247	-357	-416	-514	-817
P25	327	61	1188	1460	370	45	749	291	-44	16	327	61
P50	1719	1416	3216	4094	1296	688	1441	1285	423	728	1719	1416
P75	3473	3345	5941	7743	2597	2017	2532	3117	875	1329	3473	3345
P90												

Note: The left-hand column provides the percentiles (P) of the distribution.
Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

decision to enter subcontracting relations is not completely random and may depend on the NAF itself. Such an analysis would require identifying an appropriate instrument to account for the issue of endogeneity. The available data, however, do not provide for such an instrument that would allow us to segregate a firm's decision to subcontract from its NAF. While some attempts have been made in the literature towards this (particularly in Basole et al., 2015, which examines the impact of linkages on GVA for a single time point, i.e., 2005–06), the instrument that is used (location of the enterprises: within or outside the household) may not be robust, as I discuss in the Appendix. Nevertheless, to assess how the results hold up over the entire growth period, particularly when I use NAF instead of GVA, I carry out a similar exercise, the results of which are also reported in the Appendix. I find that over the period of analysis, on average, controlling for other enterprise characteristics as well as for industry, time and state-zone specific heterogeneities, the subcontracted household enterprises retain a NAF which is about 69 per cent *lower* than the NAF of non-subcontracted household enterprises (Appendix Table A1). This result should, however, be interpreted with due caveats as mentioned above and as discussed in detail in the Appendix.

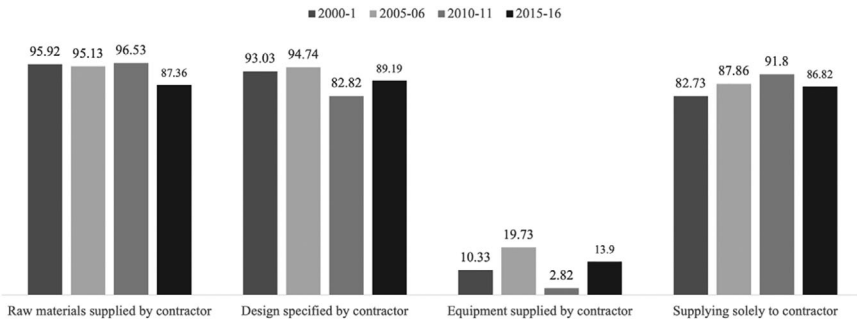
The analysis reported in this section shows that the subcontracted household enterprises have lagged behind the non-subcontracted ones in their ability to retain NAF, and, consequently, in their potential to transition into larger enterprises, even during the period of high economic growth. This leads us to critically examine the *nature* of subcontracting linkages that is prevalent in the Indian informal manufacturing sector that may help to partly, but importantly, explain the lack transition possibilities for the subcontracted enterprises.

NATURE OF SUBCONTRACTING LINKAGES

Characterizing the Nature of Linkages

Some authors argue that subcontracting linkages might be beneficial for informal subcontracted firms if these enterprises have relative *autonomy* in their relationship with parent firms. Such autonomous linkages may ensure that subcontracted enterprises have better access to inputs, markets and credit, may lead to 'decent work' conditions for the self-employed, and may reduce possibilities of an exploitative, dependent relationship between parent and subcontracted firms (Chen, 2006; ILO, 2002; Kantor et al., 2006; Meagher, 2013). It has also been argued that subcontracted enterprises may have better growth possibilities if they are part of networks that allow them to strategically participate in the decision-making process (Sacchetti and Sugden, 2003).

Figure 3. Characteristics of Subcontracted Household Enterprises (%)



Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

The analysis in the previous section shows that, over the peak growth period, the subcontracted household enterprises in the informal manufacturing sector had less possibility to grow and transition over time than the non-subcontracted ones. While the non-subcontracted household enterprises may be categorized as autonomous enterprises, for the subcontracted ones the degree of autonomy varies depending on the nature of their linkage with parent firms/contractors. I now focus on the subcontracted household enterprises to examine their degree of autonomy or dependence, and how this relationship has evolved over the growth period.

I find that subcontracted firms have remained highly dependent on parent firms/contractors in a number of ways (Figure 3). A vast majority of subcontracted household enterprises receive raw materials from contractors (87 per cent to 97 per cent over the period), have designs of their products specified by contractors (83 per cent to 95 per cent), and supply the entirety of their produce to contractors (83 per cent to 92 per cent). Transfer of technology to subcontracted firms through these linkages has remained very low: the proportion of subcontracted household enterprises having equipment supplied by contractors fell from 10 per cent in 2000–01 to less than 3 per cent by 2010–11, increasing to about 14 per cent by 2015–16. In fact, most household enterprises do not use any hired tools and machinery, with about 96 per cent of them only using their own tools.

Thus, in such subcontracting relations, almost all variable inputs required for production are provided by parent firms, while production and labour processes are carried out by subcontracted firms. Dependence on home-based tools keeps the cost of operation low, but may not lead to an upgrading of the subcontracted firm's technology. Access to unwaged family labour working in the household enterprises, and to household tools and other resources used by these enterprises

without incurring any additional cost, are likely to be major incentives for larger firms to enter subcontracting relations with the household enterprises.

These dominant features of linkages, whereby raw materials are provided by the contractor while subcontracted firms supply the *entire* production output to parent firms/contractors, make these subcontracting relations akin to a *putting-out* system.¹² In such a system, the subcontracted firm loses its identity as an independent production unit, becoming more like an extension — almost an appendage — of the parent firm, without formally being part of it. While the subcontracted firm remains spatially separated from the parent firm, its autonomy over important aspects of the production process (such as quantity of output, design of the product, raw materials to be used) is taken over by the parent firm. Given that in our data the parent firms are identified as ‘bigger firms’, they are likely to be either informal establishments, i.e., firms in the relatively ‘modern’ segment of the informal sector, or formal sector firms. In these cases, the logic of the ‘traditional’ enterprises, driven by consumption need (Harris-White, 2014; Sanyal, 2007), gets subsumed under the accumulation and growth-oriented logic of the parent firms.¹³ Under such putting-out relations, these household enterprises can no longer be classified as non-capitalist in nature; rather, their production processes are integrated with the capitalist firm, even though they are not formally made a part of the latter.

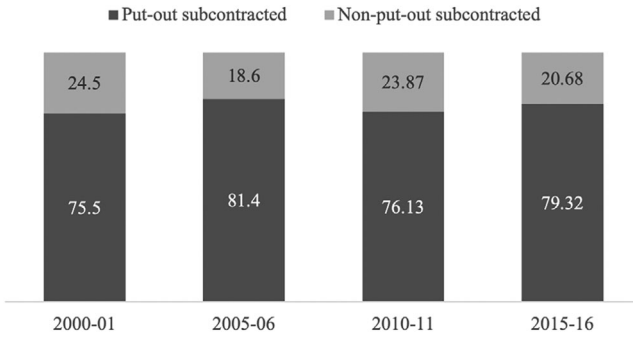
In the following analysis, I characterize household enterprises that (a) procure raw materials from, (b) have designs specified by, and (c) supply entire output to parent firms/contractors as put-out firms.¹⁴ Parent firms may use the supplied output either as inputs in their own production processes or as final output for sale. I consider those subcontracted

12. See Basole and Basu (2011), Bhattacharya et al. (2013) and Bhattacharya and Kesar (2020) for discussions on putting-out arrangements in the Indian informal manufacturing sector.

13. There has been much debate in the critical literature on the categorization of informal firms according to whether they follow an independent, autonomous non-capitalist economic logic, or gear themselves towards satisfying the economic interests of the capitalist segment (with varying degrees of autonomy), or are completely dependent on and subsumed under the capitalist segment (Harris-White, 2014; Sanyal, 2007). There is, however, likely to be a wide heterogeneity among the informal firms ranging from: (a) independent family-based units that are governed by their autonomous economic logic and are not integrated with the capitalist enterprises; (b) subcontracted enterprises that retain some autonomy over production and sale; (c) put-out subcontracted enterprises that are completely dependent on parent firms for inputs and raw materials as well as for sale of the final output, making the working owners and family workers in these enterprises effectively disguised wage workers (Bhattacharya and Kesar, 2020; Kesar et al., 2022).

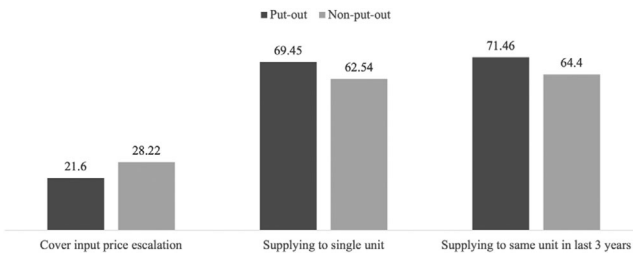
14. I do not include equipment supplied as one of the characteristics to identify autonomy/dependency of a subcontracted firm on its parent firm since most of the dependent subcontracted enterprises (about 70 per cent) do not use plants or machinery to carry out their production, working with basic tools and equipment. This is reflective of the labour-intensive nature of subcontracted work.

Figure 4. Subcontracted Household Enterprises: Proportion of Put-out and Non-put-out Firms (%)



Source: Author’s calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

Figure 5. Characteristics of Subcontracted Enterprises under Putting-out and Non-putting-out Relations, 2010–11 (%)

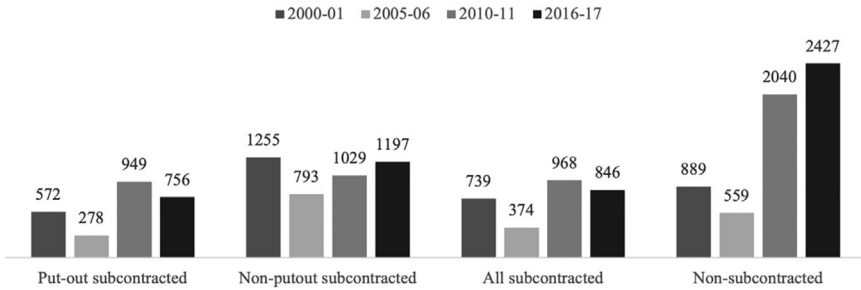


Source: Author’s calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

household enterprises that do not satisfy *all three* criteria of a put-out firm mentioned above to be relatively autonomous, i.e., non-put-out subcontracted household enterprises. I find that for all four time points in the study, more than three quarters of the subcontracted household enterprises (ranging between 76 and 81 per cent) can be characterized as operating under putting-out relations (Figure 4). These put-out firms also display other forms of longer-term dependence on parent firms/contractors. Put-out household enterprises are more likely than others to supply to a *single* contractor, to supply to the *same* contractor for a relatively long period of time, and to be in relations that do not cover for input-price escalation (Figure 5).

The put-out firms appear to be completely dependent on their parent firms without any autonomy over production and sale. However, while they are contracted by parent firms almost as wage workers to carry out production without any control over inputs, production process, or final output, they do not become an internal part of the parent enterprise as

Figure 6. Monthly Average Net Accumulation fund (NAF) of Put-out, Non-put-out, Subcontracted and Non-subcontracted Enterprises (at 2015–16 prices in INR)



Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

workers. The put-out enterprise, rather, becomes a kind of hybrid between an enterprise and a worker, through the process of subcontracting, as has also been noted by Sanyal (2007). The following section explores how the potential for subcontracted household enterprises to accumulate and transition over time varies depending on the nature of linkages and firm characteristics.

Accumulation Possibilities and Nature of Linkages

Here I examine how the ability of subcontracted firms to grow and accumulate (captured by the NAF) varies across put-out and non-put-out household enterprises (see Figure 6). Further, I use an ordinary least squares (OLS) regression on the pooled sample of repeated cross-sections of enterprises over the growth period to estimate the average difference in NAF between the put-out and non-put-out firms, controlling for sector-level, state-level and industry-level and time-specific heterogeneities (Table 7, columns 1 and 2). I do not make any causal claims here.

$$\text{NAF}_i = \beta_0 + \beta_1 \text{Putout}_i + \beta_2 t_i + \text{controls}_i + \mu_{it} \quad (3)$$

On average, the NAF retained by a put-out household enterprise is significantly lower than that of the non-put-out ones (as well as that of the non-subcontracted household enterprises) (Figure 6). This difference has somewhat narrowed, albeit inconsistently, over time. For example, in 2000–01, the mean NAF retained by the non-put-out subcontracted household enterprises was approximately 2.2 times higher than that of the put-out household enterprises, while in 2010–11 and 2015–16 it was 1.1 and 1.6 times, respectively. The OLS estimation also shows that non-put-out firms

Table 7. Difference in NAF between Put-out and Non-put-out Subcontracted Firms

	(1) NAF	(2) NAF	(3) NAF	(4) NAF
Put-out	-470.5***	-142.2**	-680.6***	-266.4**
(Reference: Non-put-out)	(131.9)	(59.98)	(99.39)	(130.1)
Time 2005–06	-339.8***	-326.4**	-512.7**	-466.6**
(Reference: 2000–01)	(119.2)	(132.3)	(198.9)	(187.9)
Time 2010–11	212.6*	329.8***	-335.2	-22.95
	(108.8)	(99.30)	(221.8)	(207.6)
Time 20015–16	133.8	202.6	38.62	182.6
	(201.7)	(209.1)	(390.4)	(389.5)
Put-out # Time 2005–06	–	–	227.4	180.5
			(232.3)	(172.9)
Put-out # Time 2010–11	–	–	720.7***	460.6***
			(183.0)	(153.7)
Put-out # Time 2015–16	–	–	131.1	30.60
			(280.6)	(258.8)
Constant	1114.3***	1996.9**	1273.1***	2064.9**
	(119.2)	(785.4)	(130.9)	(847.8)
Industry controls	No	Yes	No	Yes
State zone controls	No	Yes	No	Yes
Rural/urban control	No	Yes	No	Yes
Observations	56721	56721	56721	56721
Adjusted R2	0.022	0.125	0.024	0.126

Notes: Cluster robust standard errors clustered at state-levels in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

retain a higher NAF than put-out firms. On average, controlling for over-time variations, put-out firms retained a monthly NAF of around INR 470 less than non-put-out firms (Table 7, column 1), which accounts for about half the average monthly NAF of non-put-out firms for 2015–16. Once state and industries are controlled for, the difference is about INR 142 (Table 7, column 2).

On average, the more closely a subcontracted firm is aligned with its parent firm, the lower is its ability to grow and transition. Thus, put-out firms are most aligned with parent firms and are most likely to be governed by the operational logic of the larger parent enterprise; they also have the least possibility among different types of household enterprises (including non-subcontracted and relatively autonomous subcontracted household enterprises) to grow and transition.

It is worth probing what type of firms enter such non-autonomous subcontracting relations and the implications thereof. To explore this, I undertake two exercises. First, for the set of subcontracted household enterprises, I estimate how the likelihood of being put-out versus being non-put-out varies based on enterprise characteristics (Specification 4). I use a logit maximum

likelihood estimation and report the odds ratios (Figure 7).

$$\Pr(\text{Put} - \text{out} = 1) = F(\mathbf{a}_0 + \mathbf{a}_1 \mathbf{X}_i + \mathbf{a}_2 \text{controls}_i + \mu_i) \quad (4)$$

where \mathbf{X} is the vector of enterprise characteristics and controls including the state zones, industry groups and time points.

Second, I estimate to what extent the difference in NAF between put-out and non-put-out firms (after controlling for any differences emanating from state-, sector-, industry- and time-specific heterogeneities) can be explained by various enterprise characteristics. I do this by decomposing the difference in NAF through a three-way Oaxaca–Blinder decomposition and estimating the crude difference that can be *explained* on the basis of put-out and non-put-out household enterprises having different endowments of firm characteristics (Table 8). The enterprise characteristics (\mathbf{X}) that I consider include gender of enterprise owner, location of the firm (within/outside the household), registration status of the firm, whether the firm maintains accounts, sector (rural/urban), whether the firm has operated for more than or less than three years, total number of workers, and total value of assets.

The gender of the head of the household and the location of the firm significantly explain whether a subcontracted household enterprises is put-out or not (Table 8). On average, a female-owned subcontracted household enterprise is about 1.7 times more likely to be put-out relative to a male-owned one, *ceteris paribus*. A subcontracted household enterprise that is located inside (outside) the household is about twice (half) as likely as those located outside (inside) to be put-out vis-à-vis being non-put-out (Figure 7). Most other enterprise characteristics do not exhibit a statistically significant relationship with the likelihood of being put-out. This resonates with various case studies that find a concentration of home-based women workers in subcontracting relations in informal manufacturing industries in India (Carr et al., 2000; Chen et al., 1999; Rani and Unni, 2009).

From the second exercise, I find that the gender of the enterprise owner and the location of the firm also stand out as the most important characteristics in explaining the difference in NAF between put-out and non-put-out firms. For example, the gender of the enterprise owner explains about 79 per cent and the location about 24 per cent of the difference in NAF (endowment component reported in the detailed decomposition panel in Table 8).

This points to the significance both of the feminized nature of put-out subcontracted processes, and of the use of the household space for the enterprises participating in such processes, which allows the parent firm to access and commonize household resources without incurring any explicit cost. While being embedded in such relations is likely to provide an assured access to market and inputs for female-owned household enterprises located within households that may otherwise find such access difficult to attain,

Table 8. Decomposition (Oaxaca–Blinder) of Difference in NAF between Put-out and Non-put-out Firms

Overall				
Non-put-out	1148.7*** (88.34)			
Put-out	668.1*** (29.16)			
Difference	480.6*** (93.05)			
Endowments	533.7*** (58.70)			
Coefficients	-172.1** (67.97)			
Interaction	119.0* (71.42)			
Detailed decomposition	Endowments	Percentage	Coefficients	Interaction
Female-headed enterprise (Reference: non-female-headed)	378.7*** (39.02)	78.8%	53.32 (135.8)	-19.37 (49.35)
Located outside household (Reference: Located within HH)	114.9*** (29.17)	23.91%	-12.64 (10.91)	-39.18 (34.15)
Log of value of assets held (in INR)	78.18*** (19.81)	16.27%	2962.7*** (628.3)	99.17*** (31.66)
Operated more than 3 years (Reference: less than 3 years)	-0.724 (1.900)	-0.15%	324.3 (216.5)	-2.290 (5.949)
Number of workers	-81.92*** (23.31)	-17.05%	-180.1 (137.9)	-22.23 (18.08)
Enterprise registration (Reference: Unregistered)	54.55*** (16.82)	11.35%	-17.86* (10.59)	-22.44 (14.19)
Account maintained (Reference: not maintained)	3.383 (2.606)	0.70%	0.875 (6.076)	0.496 (3.456)
Urban (Reference: rural)	1.551 (4.833)	0.32%	77.76** (36.70)	23.14* (12.34)
Time dummy 2005–06 (Reference: Year 2000–01)	3.669* (2.090)	0.76%	-21.45 (24.74)	3.096 (3.826)
Time dummy 2011–12 (Reference: Year 2000–01)	8.518** (4.147)	1.77%	-32.79* (18.37)	-6.049 (4.379)
Time dummy 2015–16 (Reference: Year 2000–01)	0.317 (2.342)	0.07%	-31.37 (88.11)	2.456 (7.112)

(Continued)

Table 8. (Continued)

Detailed decomposition	Endowments	Percentage	Coefficients	Interaction
State zones controls	Yes	8.31%		
Industry controls	Yes	-14.02%		
Constant	53.32 (135.8)		-2509.9*** (734.2)	
Observations	57940			

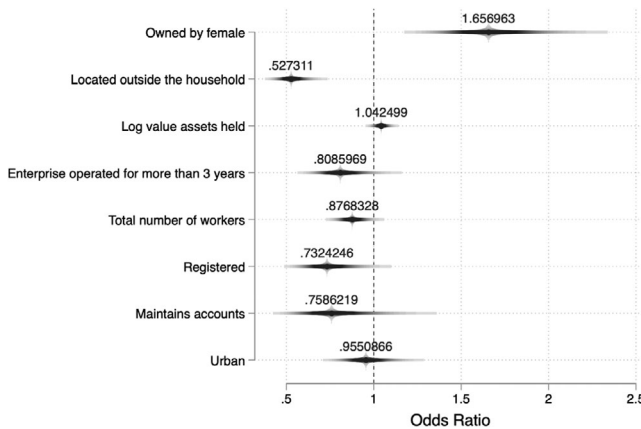
Notes: Cluster robust standard errors clustered at state-levels in parentheses.

* p<0.10, ** p<0.05,*** p<0.01.

Reference denotes the reference category of the variable.

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

Figure 7. Likelihood of Being Put-out among Subcontracted Firms (odds ratio) over Pooled Cross-sections of Data for 2000–01, 2005–05, 2010–11, 2015–16



Notes: Logit maximum likelihood estimation, with binary dependent variable model. Dependent variable is a binary dependent variable: put-out = 1, non-put-out = 0. Regressors include gender of the head of the household (with non-female as the reference category), location of the household (within or outside the household, within the household being the reference category), log value of assets owned or hired, age of the enterprise (less or more than 3 years, with less than 3 years as the reference category), total number of workers, registration status (with not being registered as the reference category), accounts maintenance (with not maintaining accounts as the reference category), sector (rural/urban; with rural as the reference category). Additional controls include time points, industry groups, state zones. Odds ratio reported. Clustered robust standard errors, clustered at state levels.

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO survey data.

the possibilities for these firms to accumulate and transition into larger enterprises remain low (in absolute terms as well as relative to non-put-out household enterprises) on account of these characteristics. Furthermore, such patterns of put-out subcontracting relations may effectively subsidize the production costs of the parent firm given the relatively lower bargaining

power of women and the parent firm's ability to access the households' commons resources.

However, it should also be noted that autonomous subcontracting linkages have not necessarily offered consistently better opportunities for household enterprises to grow and transition over time. While in the initial part of our period of analysis (2000–01 and 2005–06), non-put-out household enterprises had the highest NAF among the different types of household enterprises (put-out and non-put-out subcontracted as well as non-subcontracted enterprises), the difference narrowed or even reversed over time. For example, in 2000–01 and 2005–06, the average NAFs of non-put-out household enterprises were 2.2 times and 2.9 times, respectively, the NAFs of put-out firms, and 1.41 times and 1.42 times, respectively, the NAFs of non-subcontracted household enterprises. However, the average NAF of non-put-out household enterprises fell to about 1.6 times the NAF of put-out firms in 2015–16 (and almost equalized in 2010–11), while its relationship with the NAF of non-subcontracted household enterprises went into reverse. For 2010–11 and 2015–16, the average NAF of non-put-out firms was equivalent to about half of the NAF of the non-subcontracted enterprises.¹⁵

Over the period of analysis, while the NAF of non-put-out subcontracted household enterprises registered a decline or became stagnant, that of the non-subcontracted household enterprises and (to a *much* lesser extent and somewhat inconsistently) the put-out subcontracted household enterprises have risen. Thus, over the growth period, non-put-out subcontracting relations have not remained associated with a better possibility to grow and transition for household enterprises relative to put-out subcontracting relations or being non-subcontracted.

CONCLUSION

Subcontracting relations have often been considered in the literature as one of the key channels that might facilitate growth in traditional informal enterprises and enable them to transition into larger and more modern enterprises. Such relations are expected to strengthen with economic growth. In this article, I examine the nature and patterns of subcontracting linkages for informal household enterprises, or own-account enterprises, in the Indian informal manufacturing sector between 2000–01 and 2015–16,

15. Introducing time interactions in our OLS regression (Specification 3 above), I find that the monthly NAF of non-put-out household enterprises is significantly higher (by INR 266) than that of the put-out ones (controlling for sector, state zone and industry groups), but the relation reverses for 2010–11, with the former becoming significantly lower (by INR 196) than the latter (Table 7, columns 3 and 4).

covering India's period of high economic growth. I construct a variable, the net accumulation fund (NAF) of an enterprise, which measures the ability of an enterprise to accumulate, grow and transition over time, and use it to analyse the transition possibilities of subcontracted household enterprises. I find that the accumulation possibilities of subcontracted household enterprises have remained much lower than those of non-subcontracted ones, and this difference has increased over the growth period.

Building upon this, I examine the nature of subcontracting linkages that have been prevalent in the informal manufacturing sector. I find that these linkages are principally characterized by a high degree of dependence of subcontracted enterprises on their parent firms, both for receiving inputs and supplying outputs. Around three-quarters of subcontracted household enterprises are embedded in relations that resemble a traditional putting-out system, in which firms receive all their raw materials and design specifications from parent firms and supply their entire output back to the latter. Moreover, only a very small proportion of subcontracting enterprises receive any tools or equipment from the parent firm, while most use home-based tools to undertake production. Household enterprises operating under such put-out relations retain very low amounts of NAF. In putting-out relations, the subcontracted firms are more like an extension of the parent firms, with little control over the production process. Given the nature of such relations, these firms are most aligned with their (relatively larger) parent firms and are more likely to be governed by the operational logic of the latter. Results show that put-out enterprises have the lowest average NAF of all kinds of household enterprises, including non-subcontracted and non-put-out subcontracted ones, making them least likely to grow and transition. Female-owned household enterprises and those located within the household space are more likely to operate through put-out relations, as these linkages allow them to access markets and inputs that may otherwise be unavailable to them. For the parent firms, on the other hand, such linkages enable them to lower their costs of operation by contracting work to home-based, female, own-account workers who are likely to have lower bargaining power, and by gaining access to non-commodified household resources, such as unwaged family labour, household tools, household space, etc. I find that, during the growth period, enterprises in non-put-out and relatively more autonomous subcontracting relations had, on average, a higher NAF (and thereby increased potential to grow and transition) than those in put-out and less autonomous relations — although this difference has significantly narrowed over time. For the first part of the growth period, autonomous subcontracted household enterprises had a higher NAF than even the non-subcontracted firms, but this relation reversed later.

Given that a vast majority of household enterprises entering subcontracting relations do not have much possibility to accumulate, grow and

transition, it is likely that they are motivated by household consumption needs, which may otherwise be difficult to meet. This makes these enterprises somewhat akin to the petty production units that comprise the non-capitalist segment in the informal economy, which, as Sanyal (2007) argues, get reproduced with economic growth rather than withering away. However, as Sanyal notes, as these enterprises enter subcontracting linkages, they lose their autonomous non-capitalist character. Depending on the nature of linkages, the subcontracted enterprises may either be completely subsumed under the parent capitalist firm, transforming the working owners and family workers of such enterprises into disguised wage workers; or they may be integrated with the capitalist firm, while maintaining some autonomy and without being completely subsumed, through a process of dispersion of the capitalist segment (*ibid.*; see also Kesar et al., 2022). As we have seen from our analysis, subcontracting relations among informal household enterprises in India have predominantly been of the former kind. In sum, the nature of subcontracting relations prevalent in the informal economy in India, even during the peak growth period, appears to be starkly distinct from the dynamic linkages that are celebrated in the literature as a channel for facilitating growth and transition.

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APPENDIX

As noted in the main text, an estimation of the impact of subcontracting linkages on a firm's NAF using an ordinary least squares

(OLS) approach may suffer from potential selection bias and yield inconsistent estimates, given that the decision of a firm to enter a subcontracting relation is not completely random (see Heckman, 1979). A potential way to account for the endogeneity is to use an endogenous treatment regression model with a relevant exclusion restriction.

Basole et al. (2015), examining the impact of linkages on GVA for a single time point (2005–06), use the *location of the enterprise* (whether the enterprise is located outside or inside the household) as an exclusion restriction to account for endogeneity biases. This restriction implies that while the dummy for location of the enterprise impacts the enterprise's decision to subcontract, it does not impact an enterprise's GVA after controlling for other variables. Basole et al. (2015) justify the use of this exclusion restriction by arguing that while location directly impacts the decision to contract, its impact on the performance (GVA) of the firm happens only through other channels, specifically the gender of the head of the enterprise and the assets of the enterprise, which are controlled for. Female-headed enterprises are more likely to work from within the household, perform worse and earn lower returns to investment than non-female headed ones, and to have fewer market linkages and network contacts, thereby inhibiting the growth of the enterprises (Amuedo-Dorantes, 2004; Sethuraman, 1998). Further, assets of enterprises which are located outside the household have a much higher value than those located within, and are able to perform better due to higher capital intensity and worker productivity (Basole et al., 2015). Therefore, it is argued that once the gender of the head of the enterprise and the assets held by the enterprise are controlled for, the location of an enterprise does not directly impact the performance of the enterprise in the outcome equation. It may, however, be argued that this exclusion restriction is not very robust as the location of an enterprise is likely to impact its performance not only through the above-mentioned channels but simply through its impact on the enterprise's ability to access markets, and through other channels that are not accounted for.

While keeping this limitation in mind, I carry out a similar exercise to assess how the results hold up over the entire growth period. I use NAF instead of GVA, given that the available data do not allow for a more suitable exclusion restriction than location of the firm. The results of the exercise should, however, be interpreted with appropriate caveats.

I employ an endogenous treatment regression model to infer the impact of the subcontracting status, i.e., the treatment, on the NAF of the household enterprises, i.e., the outcome, over the growth decade, and use the location of enterprise (outside/inside the household) as the exclusion restriction. Other enterprise characteristics that are included as control variables include gender of the head of the enterprise, log of total value of assets held

by the enterprise, sector (rural/urban) in which the enterprise is based, whether the enterprise has been operational for more or less than three years, number of workers in the enterprise, registration status of the enterprise, whether the enterprise maintains accounts, and industry, state zone, and time controls. The model is estimated using a Maximum Likelihood Estimation.¹⁶

The regressions are carried out on the independently pooled sample of repeated cross-sections of household enterprises over the following four time points: 2000–01, 2005–05, 2010–11, and 2015–16. In Model Specification 1 noted in the main text, the variable of interest is the contract dummy, which captures the average impact of subcontracting on the household enterprise's NAF. Specification 2 introduces time interactions of the contract dummy in order to capture the impact of linkages at each of the four time points. The results of the regressions and other parameters of the model are reported in Table A1.

The analysis shows that being in a subcontracting relationship negatively impacts a firm's NAF. The estimated average treatment effect (ATE) for the subcontracting dummy — our variable of interest — in Model Specification 1 is -1.179 and it is significant at the 1 per cent level, that is, the subcontracted enterprises, on average, retain 69.2 per cent (or, $100 * [\exp(-1.179) - 1]$) less NAF than non-subcontracted enterprises, *ceteris paribus*. Results from Model Specification 2 (as noted in the main text) suggest that in 2000–01, a subcontracted firm, on average, retained 61.9 per cent (or, $100 * [\exp(-0.965) - 1]$) less NAF than non-subcontracted firms, *ceteris paribus*, without there being any significant change over the subsequent time points, except in 2015–16 when the difference narrowed to 41.9 per cent. (Table A1).

16. Let the potential outcome (here, the NAF retained by the household enterprises) be denoted as Y_i and the treatment status (here, the subcontracting status) as T_i , which takes value 1 if a firm is subcontracted and 0 if a firm is not subcontracted. Let T_i^* be a latent variable which determines the enterprise's decision to subcontract, such that: $T_i = \begin{cases} 1 & \text{if } T_i^* > 0, \text{ i.e., if the firm is subcontracted} \\ 0 & \text{if } T_i^* \leq 0, \text{ i.e., if the firm is not subcontracted} \end{cases}$ and, $T_i^* = Z_i\gamma + \varepsilon_i$ (1) i.e., where Z_i is a ' $k \times 1$ ' vector of characteristics which affects the household enterprise's assignment into being subcontracted and γ is a ' $1 \times k$ ' vector of parameters, and ε_i is a stochastic unobserved error term. The probabilities of being in a subcontracting relation or not, conditional on the enterprise characteristics (vector Z), are given, respectively, by: $\text{Prob}(T_i = 1|Z_i) = \Phi(Z_i\gamma)$ and $\text{Prob}(T_i = 0|Z_i) = 1 - \Phi(Z_i\gamma)$. The outcome equation is given by: $y_i = X_i\beta + T_i\delta + \mu_i$, (2) where X_i is a vector of enterprise characteristics. Our coefficient of interest is δ , which captures the impact of subcontracting on the household enterprise's NAF.

Table A1. Impact of Subcontracting Linkages on NAF of Household Enterprises: Endogenous Dummy Variable Model. Dependent Variable Log (NAF); Instrument: Enterprise Location Within or Outside the Household

	(1)NAF		(2) NAF	
	Outcome equation	Selection Equation	Outcome equation	Selection Equation
Subcontracted (Reference: non-subcontracted)	-1.179*** (0.209)		-0.965*** (0.264)	
Subcontracted# Time 2005–06			0.0878 (0.155)	
Subcontracted# Time 2010–11			0.0268 (0.0733)	
Subcontracted# Time 2015–16			0.421*** (0.116)	
Located outside household (Reference: Located within)		-0.252*** (0.0451)		-0.252*** (0.0453)
Female-headed enterprise (Reference: non-female-headed)	-0.756*** (0.0614)	0.200*** (0.0473)	-0.753*** (0.0614)	0.202*** (0.0473)
Log of value of assets held (in INR)	0.188*** (0.0127)	0.00519 (0.0169)	0.189*** (0.0125)	0.00501 (0.0166)
Urban (Reference: rural)	0.288*** (0.0521)	0.279*** (0.0746)	0.290*** (0.0513)	0.278*** (0.0751)
Operated more than 3 years (Reference: less than 3 years)	0.0959*** (0.0252)	-0.0917 (0.0625)	0.0977*** (0.0253)	-0.0894 (0.0629)
Number of workers	-0.0134 (0.0248)	0.0301 (0.0430)	-0.0206 (0.0249)	0.0282 (0.0429)
Enterprise registration (Reference: Unregistered)	0.255*** (0.0443)	0.201*** (0.0657)	0.259*** (0.0445)	0.200*** (0.0654)
Account maintained (Reference: not maintained)	0.220*** (0.0510)	-0.0592 (0.112)	0.214*** (0.0551)	-0.0583 (0.112)
Time dummy 2005–06 (Reference: Year 2000–01)	-0.109 (0.0780)	-0.200** (0.0942)	-0.165 (0.163)	-0.201** (0.0945)
Time dummy 2011–12 (Reference: Year 2000–01)	0.249*** (0.0430)	-0.753*** (0.117)	0.251*** (0.0857)	-0.745*** (0.118)
Time dummy 2015–16 (Reference: Year 2000–01)	0.310*** (0.0842)	-0.374*** (0.0656)	0.0245 (0.120)	-0.393*** (0.0616)
State zone controls	Y	Y	Y	Y

(Continued)

Table A1. Continued

	(1)NAF		(2) NAF	
			(with time interactions)	
Industry controls	Y	Y	Y	Y
Constant	5.302*** (0.204)	-2.221*** (0.247)	5.227*** (0.197)	-2.214*** (0.247)
/athrho	0.543*** (0.0930)		0.541*** (0.0971)	
Insignia	0.173*** (0.0168)		0.170*** (0.0177)	
Observations	208816		208816	

Notes: Cluster robust standard errors in parentheses clustered at state level.

* p<0.10, ** p<0.05, *** p<0.01

Reference denotes the reference category of the variable.

Omitted category for above variables is 2000–01.

Source: Author's calculations using 56th, 62nd, 67th and 73rd rounds of NSSO data.

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