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Measuring Inclusive Growth: From Theory to Applications in North Africa

Key Messages

- In the Middle East and Africa (MENA) region, concern with inclusive growth has been nurtured by the Arab uprisings after 2010. It is noteworthy that the uprisings in the main occurred against a somewhat paradoxical background of a period of relatively improved economic performance in the region.
- Interest in the relationship between growth and equity has long tradition in economics. In recent years this interest has been invigorated with new calls for greater attention to equity and distribution to accompany economic growth.
- This document defined for this purpose a new measurement method to evaluate the inclusiveness of growth. The index is made up of ten dimensions covering relevant aspects of growth could render inclusive. They include growth; the labor force and employment; health and demography; education; safety nets; social cohesion; gender ; the environment ; spatial aspects and governance.
- In general North African countries underperformed internationally and appeared in the lower median of rankings for all countries. Tunisia was an exception, however, given that her inclusive growth index is on par with that of China, Chile, Russia and Jordan, but lower than that for South Korea and Malaysia.
- Finally, in the wider Middle Eastern context, oil economies in general performed worst in terms of the inclusiveness of growth.

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1. Introduction

'But what improves the circumstances of the greater part can never be regarded as an inconveniency to the whole. No society can surely be flourishing and happy, of which the far greater part of the members are poor and miserable.'

Adam Smith (1974: 181)

Interest in the relationship between growth and equity has a long tradition in economics. In recent years, this interest has been invigorated with new calls for greater attention to equity and distribution to accompany economic growth (for a review of earlier discussions, see Hakimian, 2013). A number of developments have contributed to this revival.

In Asia, for instance, where rapid and sustained growth has brought about a considerable dent in poverty, inequality has, however, proven much more pervasive¹. For its part, the recent 'African Renaissance' (with growth rates averaging around 6% per annum during 2001-08) has failed to create a significant reduction in poverty while inequality has been rising both between and within countries (JICA, 2012: 6). In recent decades, therefore, we have witnessed a shift of emphasis away from Pro-Poor Growth (PPG) policies in favour of policies that make growth more 'inclusive' for the benefit of 'the widest' social and economic groupings.

Reflecting this, inclusive growth now features as a key element in the long-term strategic framework of the Asian Development Bank (ADB, 2008 and 2014). The ADB has called for '...the continuation of pro-growth economic strategies – but with a much sharper focus on ensuring that the economic opportunities created by growth are available to all – particularly the poor – to the maximum extent possible' (ADB, 2007: 13-14). Similarly, the African Development Bank has recently highlighted inclusive growth as a key development objective, conceptualising it in terms of four dimensions: economic, social, spatial and political inclusion. This builds on the ADB's earlier call for broadening access 'to economic opportunities for more people, countries and regions, while protecting the vulnerable' (AfDB, 2013: 10).

A number of recent empirical studies have contributed to this change in the policy climate. While Stiglitz (2012) and Picketty (2014) have most notably shed new light on the relationship between growth and equity, the upshot perhaps has come from an unexpected source – a recent IMF study – which has found lower net inequality 'to be robustly correlated with faster and more durable growth' (Ostry et al, 2014).

In the Middle East and Africa (MENA) region too, concern with inclusive growth has been nurtured by the Arab uprisings after 2010. This interest has partly emanated from the need to understand the root causes of these upheavals and partly from the challenges in the post-uprising era which have seen mounting expectations to improve the conditions of the masses. It is noteworthy that the uprisings in the main occurred against a somewhat paradoxical background of a period of relatively improved economic performance in the region. During 2000-10, for instance, MENA's real GDP growth averaged around 4%-5% a year (Hakimian, 2011 and 2013) including in Tunisia, Libya, Yemen and Egypt, where mass revolts erupted. Yet, the region suffered from economic and social disparities with persistently high unemployment, particularly amongst the youth. The experience of the Arab region has shown how a narrow focus on growth and a failure to consider its wider ramifications can have far-reaching consequences. This has in turn put the importance of growth in perspective by reminding us of the fact that the type and pattern of growth are of significance as well.

This paper builds on my earlier work on conceptual and empirical aspects of inclusive growth in North Africa, which appeared as a Policy Brief by the African Development Bank (Hakimian, 2013). That paper focused, first and foremost, on an in-depth review of the concept of inclusive growth and its application in the North African context. The present paper extends that analysis in a number of important ways.

First, here the focus is on the methodology for measuring inclusive growth. This involves a fuller discussion of the broad dimensions (the so-called 'pillars') on which the choice of individual indicators rests as well as extending the number of countries and indicators that are used

¹ Rapid growth between 1990 and 2005, pushed down the number of those below the \$1-a-day poverty line in Asia to 604 million (from 945 million) almost halving the headcount ratio from 35% to 18%. It has been estimated that every 1% growth has been associated with an almost 2% reduction in poverty in Asia, yet income inequality has increased over time (see Ali, 2007a: 2-3 and 2007b).

in the dataset (153 countries in all). Second, a more thorough discussion of measurement steps involved in the construction of composite indicators is offered along with a discussion of the principal challenges in constructing such an index. Third, we use two five-year period averages to capture the developments in the decade before the Arab uprisings better (2001-5 and 2006-10 as opposed to 2000-02 and 2008-10 as in the first paper). Last, but not least and as discussed later, the measurement methodology is also refined to get better results (for instance arithmetic mean replaces the geometric mean method used in the first paper to allow easier interoperation of the results).

To contextualise the measurement effort, Section 2 offers a broad review of thinking on inclusive growth in conceptual and policy terms. This is then followed by a discussion of a number of common composite

indicators that are used to measure diverse socio-economic phenomena and a critical examination of their uses and limitations in Section 3. This sets a first step to measuring inclusive growth through a single composite index. Section 4 focuses on an in-depth discussion of the dimensions and the choice of indicators and methodological problems encountered for constructing such an index. The computation results are then presented and discussed followed by a critical discussion of the findings, their meaning, significance and limitations. A final section offers our summary and conclusions.

In the next section, we discuss the meaning and significance of inclusive growth and examine its broader implications for growth and development before turning to its measurement and application in North Africa.

2. Inclusive Growth: An Overview

Recent interest in inclusive growth has led to a flurry of contributions dealing with a wide range of issues from the conceptual and analytical complexities of the subject to its measurement difficulties and understanding specific country experiences. To a large extent, this reflects the fact that growth is seen as a necessary, and not sufficient, condition for a country's ability to improve the welfare of its population. The quality of growth, its sustainability as well as the degree to which its benefits may extend to the widest sections of the society have thus attracted increasing attention (see Tandon and Zhuang, 2007; Ali, 2007a and 2007b; Rauniyar and Kanbur, 2010; Klasen, 2010; and Felipe, 2010; Ianchovichina et al, 2009, among others; Hakimian, 2013, offers a broad review of the recent literature). This interest has permeated recent policy debates with equal vigour and inclusive growth now features as a common development objective for both the ADB (2008) and the AfDB (2013)².

Despite growing calls for growth to be made more inclusive, there is not as yet a universally agreed notion of 'inclusive growth'. While growth is easier to define and measure, specifying what makes it 'inclusive' is much more contentious. There is broad agreement that inclusive growth is growth for 'the benefit of most', but ambiguities and disagreements abound beyond this general idea.

Taking a somewhat narrow approach, for instance, inclusive growth can be characterised as 'growth plus declining income disparities' (Rauniyar and Kanbur, 2010). In this formulation, inclusive growth stretches the Pro-Poor-Growth (PPG) approach by adopting a wider notion of who constitutes the poor. This definition, it must be noted, excludes non-income considerations and, therefore, lends itself much more easily to measurement (Klasen, 2010: 5).

At another – opposite – extreme, inclusive growth is also sometimes loosely referred to as 'growth that benefits everyone'. In this – perhaps its broadest sense – the concept seems to imply that growth should 'benefit all stripes of society, including the poor, the near-poor, the

middle income groups, and even the rich' (Klasen, 2010: 2). This is equally problematic and highlights the fact that it is not just who is to benefit from growth but the extent and distribution of such benefits are important considerations and should not be overlooked.

Both the narrow and broad definitions, however, suffer from common limitations: they focus on income and are concerned with outcomes only. This is seen in more recent formulations of inclusive growth which seek to incorporate non-income elements too and depict it as a process and not just an outcome (Klasen, 2010).

More recent contributions have stressed the role of opportunities in generating inclusive growth. ADB's Eminent Persons Group refers to inclusive growth as 'economic opportunities' that are 'available to all – particularly the poor – to the maximum possible extent' (ADB, 2007: 13-14; emphasis added)³. In its Strategy 2020, the ADB went further by highlighting another two three pillars for inclusive growth: (a) broader access to these opportunities and (b) safety nets to prevent extreme deprivation (2008: 11-12).

There is, however, some ambiguity over the main drivers that would oversee or bring about improved access to opportunities, particularly in relation to the role of state and public policy: are market forces capable of bringing about the desired improvements in opportunities for all or is state intervention justified to improve access to these? The former approach, which is arguably a 'trickle down' version of the inclusive growth approach, is seen in the World Bank's 2006 Development Report on 'Equity and Development', which defines equity broadly as 'equal opportunities to pursue a life of one's choosing.' In a similar light, Ianchovichina et al emphasise that inclusive growth is about 'raising the pace of growth and enlarging the size of the economy' and not about 'redistributing resources' (2009: 3).

For some, safety nets and social protection as well as the provision of public and social goods are also important elements of the inclusive

² The World Bank's Commission on Growth and Development conceptualised inclusivity as encompassing 'equity, equality of opportunity, and protection in market and employment' (World Bank, 2008). In 2008, ADB's Strategy 2020 formalised interest in inclusive growth by adopting it as one of its strategic development agenda (the other two being environmentally sustainable growth and regional integration; ADB, 2008). The AfDB too has adopted it as one of its two strategic objectives for 2013-22 to broaden access 'to economic opportunities for more people, countries and regions, while protecting the vulnerable' (the other strategic priority being green growth 'to make growth sustainable'; see AfDB, 2013: 10).

³ Other ADB contributions have similarly characterised inclusive growth as 'growth coupled with equal opportunities' (Ali and Zhuang, 2007; Ali and Son 2007) or even more specifically, 'inclusive growth focuses on both creating opportunities and making the opportunities accessible to all' (Ali and Zhuang, 2007: 10).

growth package. Ali and Son (2007) refer to the provision of social opportunities (such as access to health and education) and how these may vary with income levels. Similarly, the World Bank's Commission on Growth and Development talks of inclusiveness as encompassing 'equity, equality of opportunity, and protection in market and employment' (World Bank, 2008).

Focus on process helps to broaden the scope of the debate to include social and institutional aspects of growth and development. But it also throws up new challenges. One of these is how to deal with a trade-off between processes and outcomes (Hakimian, 2013). Is growth more – or less – inclusive when improved processes result in poorer economic outcomes? This can happen, for instance, when improvements in civil rights and greater mass participation in social and political affairs (such as following a revolution) may lead to short-term setbacks to economic outcomes through greater instability and turmoil. A converse scenario is equally conceivable: if better outcomes are secured in the absence of any commensurate improvements in process, does that make the experience of growth undesirable? This can happen, for instance, with an economic boom under an autocratic regime in the absence of any real reforms or improvements in governance.

Such issues could be better addressed if we had a commonly agreed indicator for measuring inclusive growth (see McKinley, 2010, for an early measurement attempt). Unsurprisingly, some of the conceptual difficulties and challenges discussed above are also mirrored in measurement difficulties and problems. Focusing on material outcomes alone (for instance, in terms of better income and/or access to social

goods and safety net), measurement is generally easier given that such outcomes are more readily quantifiable. However, when access to and benefits from growth are envisaged in terms of processes, measurement becomes harder and more complex. According to Klasen (2010) the absence of a universally agreed notion of inclusive growth has led to a wide range of measurement indicators which vary from 'unclear' to 'straightforward' to 'technically difficult'.

We can see that growing interest in inclusive growth has not been matched by success over a universal definition that can help both implement and monitor policies for inclusive growth. A variety of approaches have emerged with emphases on different aspects of the concept. Narrower concepts stress outcomes (e.g., growth plus equity) and are easier to measure and monitor. Wider concepts are multi-dimensional and hence more ambitious in scope: they stress improved opportunities for achieving better outcomes; they differentiate between processes and outcomes and they widen outcomes to include non-income aspects (social goods and safety nets). An implicit risk is that an overambitious notion of inclusive growth becomes both meaningless and impractical if it comes close to advocating 'everything for everyone'.

The next section offers a review of a broad range of composite indices or indicators which have been designed and used to encapsulate multidimensional concepts such as human development, gender inequality, water poverty, environmental performance and the like. This will set the scene for our discussion of measuring inclusive growth through a composite index which will be presented in Section 5.

3. Measurement Issues: Computing a Composite Index

A desire to quantify performance and policy outcomes has in recent years led to the proliferation of a vast array of indicators concerned with empirical measurement of economic and social development. According to Nardo and Saisana this reflects the ‘the prevailing view today... that evidence-based policy should temper, if not replace, opinion-based policy’ (n.d.: 2).

Some of these indicators are used as broad development indices while others are applied in more specific sectors or contexts. The World Bank Development Indicators, for instance, comprises several hundred indicators which are compiled for over two hundred countries annually (World Bank, 2014). Similarly, the Millennium Development Goals (MDGs) were set to achieve specific development policy targets by 2015. These have since been the subject of international cooperation and monitoring by policy makers and the UN agencies since the turn of the century (see UN, 2014) and will be replaced by Sustainable Development Goals (SDGs) that are to shape the development agenda beyond 2015.

More specific indicators have been no less popular. As we shall see below, a variety of environmental indicators deal with different aspects of climatic change and environmental sustainability; a host of water indices address availability and quality issues (Sullivan, 2002; Sullivan, C.A., et al (2003), and Sullivan and Jemmali, 2014); while poverty indicators aim to capture a broad range of social and economic variables, to name but a few. Reflecting this growing interest, there is a large literature dealing with methodologies for developing social and economic indicators (see for instance, UNICEF, 1995).

Alongside these large and diverse indicators – amounting to what Stiglitz et al (2009) have described as ‘an eclectic dashboard’ – recent years have also witnessed the growing popularity of composite indices or indicators designed to encapsulate numerically more complex and multidimensional concepts. A composite index by construct synthesises information conveyed by a large number of indicators into a single number or score, which allows ready comparisons of performance for each country across multiple dimensions⁴. This also lends itself to the construction of country league tables based on rankings in which a country’s performance can be easily tracked based on a single score rather than across a large number of indicators and dimensions. Reflecting this interest a number of methodological manuals have sought to guide the construction and use of these indicators (see for instance, OECD, 2008; Nardo et al, 2005; and Nardo and Saisana, n.d.).

The UNDP’s pioneering Human Development Index (HDI) provides such country rankings since 1990. Developed as an alternative to conventional measures of national development, HDIs offer a broader definition of well-being and provide a composite measure based on equal weights assigned to three basic dimensions of human development: income, life expectancy and education. Since 2010, UNDP also offers an inequality-adjusted score (IHDI) to capture the effect of inequality on country rankings. These two measures would in fact be identical if there were no inequalities. In that sense, ‘the IHDI is the actual level of human development (taking into account inequality), while the HDI can be viewed as an index of the potential human development that could be achieved if there is no inequality’ (UNDP, 2012).

⁴ As a measure of broad academic interest in the subject, a search on Google Scholar of the words ‘composite indicator’ in March 2015 indicated about 664,000 entries against 328,000 reported by Nardo and Saisana in January 2009 and only 992 in October 2005 (n.d.: 1).

Table 1: Human Development (HDI) and Inequality-Adjusted Human Development (IHDI) Rankings for North African Countries, 2012 and 2013

	2012		2013		2012		2013	
	HDI	HDI	HDI	HDI	Normalised ranks (min=0; max=100)		Normalised ranks (min=0; max=100)	
					HDI	HDI	HDI	HDI
Algeria	93	-	93	-	50.3	-	50.5	-
Egypt	108	119	110	115	42.2	9.9	41.4	21.9
Libya	64	-	55	-	65.9	-	71.0	-
Morocco	131	130	129	129	29.7	1.5	32.2	12.3
Tunisia	90	-	90	-	51.9	-	52.2	-
Out of (Total countries)	186	132	187	147	186	132	187	147

Source: Data on rankings are from UNDP Human Development Reports (2013 and 2014). Normalised ranks are author's calculations based on the equation:

$$S_{ji} = 100 \cdot \left(\frac{m_j - r_j}{m_j - 1} \right); \text{ where } r_j \text{ is a country's rank for indicator } j \text{ (in descending order) and } m_j \text{ is the total number of countries for which data for indicator } sj \text{ is available}$$

Table 1 gives the HDI and IHDI rankings for the five North African countries for the period 2012 and 2013. Due to data limitations, although rising, the number of countries for which IHDI are available is still generally much lower than for HDIs. We have therefore computed also the normalised ranks for each indicator to be able to make meaningful comparisons (on a linear scale of 0 and 100) regardless of the number of the countries covered in each year's dataset. The period covered is interesting since it relates to the period either during or just after the so-called Arab Spring in some of these countries.

A number of interesting issues emerge here. First, normalised HDI rankings indicate that Morocco, followed by Egypt, has the lowest of all country rankings in the region: both are in the lower half globally (Morocco's rank is around 29%-31% and Egypt's at 41%-42%). Tunisia and Algeria by contrast rank at the median level (around the 50% mark). Somewhat surprisingly perhaps, Libya's HDI comes on top, nearer the top one-third threshold for all countries (66% in 2012 and rising to 71% in 2013).

Inequality adjustments are too patchy and far from robust or stable to warrant useful comparisons here. For both Morocco and Egypt – the only two countries for which data are available – HDI rankings drop

significantly when taking inequality into account: to as low as 1.5% for the former and 9.9% for the latter in 2012. Although the scores rise significantly in the following year – jumping to almost 12% and 22%, respectively – they remain significantly below their respective HDIs indicating the pervasive effect of inequality in both countries.

HDIs have in general inspired a new generation of composite indicators which indicate general unhappiness with GDP as a measure of welfare (see Stiglitz et al, 2009 for a comprehensive review). While to a large extent these have focused on conceptualising and measuring broader and more representative indicators of welfare and happiness (see O'Sullivan, 2014: 29-30 for a review of some of these), others have extended and applied similar methodologies for measurement in more specialised and specific contexts. Given the large, and growing, number of such indicators, it is impossible to offer but a selective review here. Below, we do this on a thematic basis focusing on a few pertinent areas such as the environment, gender and social progress.

Measuring environmental sustainability and performance has been a notable area of interest for those using composite indicators. One of the earliest examples of these is the pioneering initiative by Yale and

Columbia Universities in 2000 to develop an Environmental Sustainability Index (ESI)⁵. In 2010, ESI was revised to offer an alternative index called the Environmental Performance Index (EPI). Whereas ESI focused on ranking countries on multiple components of environmental sustainability (using as many as 76 indicators), the pared down EPI now focuses on the measurement of environmental performance with the help of 20 indicators centred around the two principal objectives of: (a) improving environmental health and (b) promoting ecosystem vitality and sound natural resource management (Hsu et al, 2013 for details of the methodology and weightings used).

As with EPI in general, the popularity and application of indicators measuring environmental performance and sustainability criteria have been on the rise⁶. Table 2 provides a summary of estimated North African country ranks based on two such composite indicators produced by EPI and the Climate Change Performance Index (CCPI). The latter has a narrower focus than EPI (since it is emission based) and covers far fewer countries (61 countries which account for over 90% of the global energy-related CO2 emission). EPI by contrast covers nearly three times as many countries (178) and gives an indication of the direction and extent of improvement over the past decade (2002-12).

Table 2: Selected Environmental Performance Rankings for North African Countries, 2012-2014

	Environmental Performance Index (EPI)		Climate Change Performance Index (CCPI)		Normalised ranks (max=100; min=0)	
	2012	Improvement During 2002-12 (%)	2013	2014	EPI (2012)	CCPI (2014)
Algeria	92	+2.48	42	49	46.6	20.0
Egypt	50	+9.76	30	26	72.3	58.3
Libya	120	+4.17	-	-	32.8	-
Morocco	81	+6.66	20	15	54.8	76.7
Tunisia	52	+6.87	-	-	71.2	-
Out of (Total countries)	178	178	61	61	178	61

Source: EPI ranks data are taken from EPI (2014) and CCPI data from Burck et al (2014). Normalised ranks are author's calculations based on methodology explained in Table 1 above

It can be seen that the EPI data put both Egypt and Tunisia at the top quartile of the performance index globally (with absolute ranks of 50 and 52 respectively out of 178 countries and normalised or percentile ranks of around 71%-72%). Algeria and Morocco rank around the median for all countries for which data is available (47%-55%) and Libya appears in the bottom one third (32.8). Moreover, all five countries indicate an improvement in their environmental performance as a whole

since 2002 with Egypt coming on top (an improving index of nearly 10% or the third most improving country worldwide). CCPI data, however, cover only three of these five countries and curiously perhaps give a very different picture pertaining largely to the CO2 emissions situation for these countries: Algeria is relegated to the bottom fifth and the order for Morocco and Egypt is reversed (the former rises to the top quartile whereas the former drops to just below the sixth decile).

⁵ One review in 2003 notes over 500 sustainability-related indicator efforts: of these efforts, 67 were global (Hsu et al, 2013: 6).

⁶ Some of the better known composite indicators in this field are: Ecological Footprint and Living Planet Index (both produced by WWF with Zoological Society of London and Global Footprint Network), Better Life Index (OECD), Well-being Index (International Union for Conservation of Nature, IUCN). Among the so-called 'Green Economy Indicators' one may mention: Low-Carbon Competitiveness Index or LCCI (Climate Institute with analysis by Vivid Economics), Climate Change Performance Index or CCPI (Germanwatch, Climate Action Network – Europe) and Global Green Economy Index or GGEI (Dual Citizen). These vary a lot in their scope, key components and specific indicators used and in their methodologies and country coverage. For a useful summary and overview of these and other indicators, see Barr (2013: Annex 1 and Annex 2).

The use of similar composite indicators has also gained popularity in other fields. In the gender domain, for instance, several indices have been developed (see van Staveren, 2013, for a full discussion of five of these). Here we mention two of the principal indicators that are used to measure inequality or gaps between women and men: the Gender Inequality Index (GII) and the Global Gender Gap Index (GGI). The former has been produced since 2010 by UNDP along with its annual HDI reports and uses a method which is similar to the Inequality-adjusted Human Development Index (IHDI) albeit with different dimensions to quantify gender inequality (GII, 2014a for scope and methodology). The latter was introduced by the World Economic Forum (WEF) in 2006 and offers a framework for measuring the scope of gender disparities based

on four principal areas: economic participation and opportunity, educational attainment, health and survival, and political empowerment. Like GII, it too provides country rankings that allow for comparisons across countries and over time (GGI, 2013: 4-6 for methodology and scope).

Table 3 gives data for the North African countries for these two and another composite index which combines environment with gender to produce an Environment and Gender Index (EGI). The latter offers a combined assessment of the conditions for 'gender equality and women's empowerment in the environmental arena' based on 27 indicators which are divided into 6 categories for 72 countries⁷.

Table 3: Selected Gender Inequality Rankings for North African Countries, 2013-2014

	Gender Inequality Index (GII)	Global Gender Gap Index (GGI)	The Environment and Gender Index (EGI)	Normalised ranks (max=100; min=0)		
	2013	2013	2014	GII (2013)	GGI (2013)	EGI (2014)
Algeria	81	124	59	47.0	11.2	18.3
Egypt	130	125	52	14.6	6.7	28.2
Libya	40	-	-	74.2	-	-
Morocco	92	129	49	39.7	4.5	32.4
Tunisia	48	-	-	68.9	-	-
Out of (Total countries)	152	136	72	152	136	72

Source: Data on GII ranks are taken from GII (2014b), GGI ranks data are from GGI (2013) and EGI rankings from EGI (2013). Normalised ranks are author's calculations based on method explained in Table 1

The picture that emerges here is far from uniform or consistent for these five countries. GII – the only data source that includes Libya and Tunisia as well – puts them at the top of regional rankings: Libya at 40 globally out of 152 countries or in the top quartile on the normalised scale, and Tunisia at 48 and top one-third, respectively. The same source accords Egypt the lowest ranking (130 out of 152 countries or in the bottom

15%. This is in sharp contrast to GGI which puts Algeria, Egypt and Morocco consistently at a very low ranking of 124-129 out of 136 countries (firmly in the bottom decile globally). The inclusion of environment in the gender index, however, seems to work in favour of these three countries as EGI raises their ranks. In all and comparing Tables 2 and 3 together it appears as if North African countries score

⁷ These six categories and their weights are: Livelihood (20%); Ecosystem (10%); Gendered rights and participation (20%); Governance (20%); Gendered education and assets (20%); and Country reported activities (10%); (see EGI, 2013: 23).

better on environment (with the exception of Libya) but the gender picture is generally very weak and unhelpful to their rankings.

More recently, the composite indicator approach has been deployed to measure and develop a more comprehensive Social Progress Index (SPI). This fairly comprehensive and wide ranging indicator epitomises the dissatisfaction with GDP as a measure of welfare as mentioned above. This is reflected in the fact that the SPI excludes GDP altogether (whether per capita GDP or GDP growth rate) as well as other economic criteria from the construction of what it considers to be ‘social’ progress. Accordingly, it focuses on four specific components to construct each of the three principal dimensions it uses to designate such progress. These are: (a) Basic Human Needs (nutrition, water and sanitation,

shelter and personal safety); (b) Well-being (access to knowledge, access to information, health and ecosystem sustainability); and (c) Opportunity (personal rights, personal freedom and choice, tolerance and inclusion and access to advanced education). The index is then constructed by applying equal weights to each of the four components and the three dimensions and computing an arithmetic average of these to estimate the SPI (a total of 54 detailed indicators are used for the 12 components used; see Stern et al, 2014 for methodology and scope).

Results are available for four of the five North African countries under study here and the latest summary data for 2014 are given in Table 4 (Libya is excluded due to data limitations).

Table 4: Social Progress (SPI) Indicator Rankings for North African Countries, 2014

	Basic Human Needs	Foundations of Wellbeing	Opportunity	Overall SPI	Normalised ranks for SPI (max=100; min=0)
Algeria	59	83	116	87	34.4
Egypt	58	66	119	84	36.6
Morocco	73	90	107	91	31.3
Tunisia	56	77	90	69	48.1
Out of (Total countries)	132	132	132	132	132

Source: SPI (2014). Normalised ranks are author’s calculations based on method explained in Table 1

Again, Tunisia comes on top with the best SPI ranking (with a close to median ranking globally or 69th position out of 132 countries). Algeria, Egypt and Morocco, however, are in the bottom third of the global social progress country distributions. It also appears that for all these four countries, the SPI is helped by better than average ‘Basic Human Needs’ rankings but is dragged down by the ‘Opportunity’ dimension. Since the indicators underlying opportunity are mainly to do with political rights and opportunities (ie, personal rights and freedom, tolerance and access to advanced education), according to this index, therefore, the region has a long way to go to benefit from

opening up and governance structures even after the recent popular uprisings.

Another notable approach which uses a composite index methodology is the UN’s Inclusive Wealth Index (IWI) which has been piloted for a group of twenty countries representing approximately three-fourth of the world’s GDP and more than half of the total population over the period 1990-2008⁸. This index aims to provide quantitative information on, and an analysis of, long-term perspectives on ‘human well-being and measures of sustainability’ (UNU-IHDP and UNEP, 2012: xxi).

⁸ These are: Australia, Brazil, Canada, Chile, China, Colombia, Ecuador, France, Germany, India, Japan, Kenya, Nigeria, Norway, Russia, Saudi Arabia, South Africa, UK, USA, Venezuela. Unfortunately, none of the North African countries is included in this study and Saudi Arabia is the only Middle Eastern country included.

The IWI seeks to measure the social value of capital assets of nations by including Natural Capital (NC) and Human Capital (HC) to the more traditional economic concept of Manufactured (or produced) Capital. The Inclusive Wealth Index is thus measured according to the following formula:

$$\text{Wealth} = P_{mc} \times \text{Manufactured Capital (MC)} + P_{hc} \times \text{Human Capital (HC)} + P_{nc} \times \text{Natural Capital (NC)}$$

Where P_{mc} , P_{hc} and P_{nc} are respective prices (weights) for each type of capital. To measure only real or changes in the physical quantities of capital stock, prices are kept constant (at US\$ 2000). One main feature of this index is that – contrary to GDP – it focuses on stock metrics (rather than flows) and thus investment is expressed in terms of real changes in the capital base of each country as follows (UNU-IHDP and UNEP, 2012: 29-30):

$$\Delta \text{Wealth} = \text{Inclusive Investment} = P_{mc} \times \Delta \text{MC} + P_{hc} \times \Delta \text{HC} + P_{nc} \times \Delta \text{NC}$$

Although still in its infancy stages, the main attraction of this index is perhaps its emphasis on the preservation of stocks as the assets base of a country and for shedding light on what happens to this base as output changes over time. This is seen, for example, from two of the key findings of the 2012 report according to which a decline in natural capital was a key source of difference in performance between IWI and growth of GDP and HDI: ‘25 percent of assessed countries, which showed a positive trend when measured by GDP per capita and the HDI, were found to have a negative IWI’ (UNU-IHDP and UNEP, 2012: 273). This is well illustrated in the case of Saudi Arabia – the only MENA country included in the index – which experienced a drop of 18% overall in its IWI despite growth in its human and manufactured capitals. This is mainly due to a massive draw down (-39%) in its natural capital (principally fossil fuels) during 1990-2008.

Last but not least, another area where the use of composite indicators has proven popular is studies dealing with water resources and scarcity.

Earlier interest in physical and hydrological aspects of water have in more recent years given way to a more multidimensional understanding which maps out water scarcity into its physical, economic, managerial, institutional and political dimensions. A large literature has emerged which emphasises the need to link up the biophysical and social worlds to produce a better assessment of water scarcity (see, for instance, Molle and Mollinga, 2003; Salameh, 2000; Sullivan et al, 2003).

One approach in this school has advocated the development of a Water Poverty Index (WPI) as a composite and multidimensional measurement of water scarcity (see Sullivan, 2002, for an early formulation). The approach has been widely adopted and extended to a wide range of countries and regions globally (Heidecke, 2006; Jemmali and Matoussi, 2013). More recently, Sullivan and Jemmali (2014) have applied it to compute a Water Poverty Index consisting of five components: (*Resources, Access, Capacity, Use and Environment*). This approach enables them to offer a different global map of water scarcity categorised by different bands of scarcity and broken down by each component.

To sum up this section, we have discussed and illustrated how composite indices have become increasingly popular in estimations of single quantitative measures of multidimensional concepts such as gender, environment, water, wealth and social progress. These indices aim to synthesise information conveyed by a large number of indicators into a single number or score, which allows ready comparisons of performance for each country across multiple dimensions. They thus lend themselves to the construction of country league tables based on rankings in which a country’s performance can be easily tracked based on a single score rather than across a large number of indicators and dimensions.

The next section applies this approach to the construction of a composite index to measure inclusive growth. Our methodology is carefully explained before presenting and discussing the findings and empirical estimations for North African countries. We then offer a critical evaluation of their uses and limitations after that.

4. Data and Methodology: Constructing a Composite Inclusive Growth Index

As discussed in the last section, composite indices have gained popularity and seen wider application in different contexts. The choice of a single measure or indicator for inclusive growth is, however, in early stages⁹. This section builds on the discussion above and offers a methodology for measuring a composite index for this purpose.

Despite the growing application of these indices, there is no agreed overall framework for computing them. Overall success will depend on several factors, 'related both to the quality of elementary data used to build the indicator and the quality of procedures used to do it' (Nardo et al, 2005: 31). But there is also broad agreement that the development of such an index will have to be guided by several criteria. Amongst the most widely applied criteria are: (a) Comparability: data used for constructing an index have to be comparable across the widest set of indicators and dataset. This can in turn reduce coverage, whether in terms of countries or indicators that can be used; (b) Accuracy: inaccuracy of data can erode the usefulness of the index as the latter is ultimately only as credible as the underlying data which it uses; (c) Flexibility: indices are useful when their construct allows for flexibility and adaptability for data changes and/or use of weights and aggregation methods especially over time; (d) Transparency: data and indicator selection as well use of weights and computation methodologies should be both accessible and readily comprehensible for users; and finally, (e) Completeness: incomplete data and missing values can affect the credibility of the computations and the usefulness of the index (Hsu et al, 2013: 18-9 for an elaboration of these in the environmental context; also Nardo et al, 2005: 32).

The OECD Methodological Handbook highlights a number of key steps that are pertinent in constructing composite indicators (Nardo et al, 2005; OECD; 2008).

First, conceptual clarity is needed to provide a sound basis for, and guide the selection of, indicators in the construction of an index. Without

a sound theoretical framework, the indicators selected for aggregation will fail 'the fitness-for-purpose principle' (Nardo et al, 2005: 10). Achieving conceptual clarity is, however, easier in some contexts than others¹⁰. As have already seen achieving conceptual clarity over inclusive growth remains a challenge – a factor that will inevitably complicate measurement and lead to different quantification approaches.

Second, data selection is another major challenge and affects the choice of indicators from a practical point of view since lack of relevant data will limit the constructor's ability to build sound composite indicators. Common concerns for the choice of data are: measurability, country coverage, relevance to the phenomenon under measurement and relationship to each other. In general, data availability is less of an issue for more standard indicators but coverage and applicability difficulties rise with more specialised requirements (such as indicators for employment structures and unemployment characteristics or for measures of poverty and inequality in contrast to standard income and health statistics). In practice, data selection can be quite subjective and given a scarcity of internationally comparable quantitative data, composite indicators often also include qualitative (soft) data from surveys and policy reviews.

Third and related to this is exploratory data analysis which should be conducted to investigate the overall structure of the indicators and to assess the suitability of the data set and to explain the methodological choices such as weighting, aggregation, etc.

Fourth, missing values need to be considered and addressed as they can affect the aggregation methodology¹¹.

Fifth, normalisation would be required in most cases to make indicators comparable. This happens, for instance, because country data coverage is not uniform for different indicators. Below, we shall see that re-scaling will be necessary to render these rankings comparable. This is necessary

⁹ See McKinley (2010) for an early example; Barr (2013) for broader discussion and a more recent example; and Ncube et al (2013) for a different approach; the discussion here builds on and goes beyond, the approach offered in Hakimian (2013). In 2011, the ADB too introduced a set of 35 indicators to fill in the gap in targeting inclusive growth in operational terms (ADB, 2011).

¹⁰ For instance, the Growth Competitiveness Index (GCI) developed by the World Economic Forum establishes a clear link between its conceptual framework and the structure of the composite indicator by defining it in terms of three broad categories: (a) the macroeconomic environment, (b) the quality of public institutions, and (c) technology. By contrast, a concept such as human happiness would be much more difficult to define and this is reflected in its measurement difficulties as well (O'Sullivan, 2014: 29-30 for a review of these issues).

¹¹ For instance, use of Factor Analysis requires full data sets and no allowance can be made for missing data (O'Sullivan, 2014: 14).

because individual country ranks in respect of certain indicators are rarely for an identical number of countries (given data problems mentioned above).

Sixth, even with good quality data and appropriate normalisation approaches, the question of how to decide weights and what aggregation methods to use are issues to consider. For instance, using additive or multiplicative aggregation methods affects the index – an issue that has received attention in the literature (see for instance, Garriga and Foguet, 2010 and Sullivan and Jemmali, 2014: 11)¹².

A last issue concerns the results. Once computed, they should be checked for robustness and sensitivity analysis should be conducted to assess the significance of each sub-component and individual indicator in the overall country performances (see Nardo et al, 2005, and OECD, 2008: 20-21, for a useful checklist and an extended discussion of these issues).

These steps or practical considerations are highlighted in the following section which draws from a choice of different indicators to construct a combined single measure for Inclusive Growth (IG) for North African countries. This will then be used to compare their performance both over time and in relation to a selection of other peer countries.

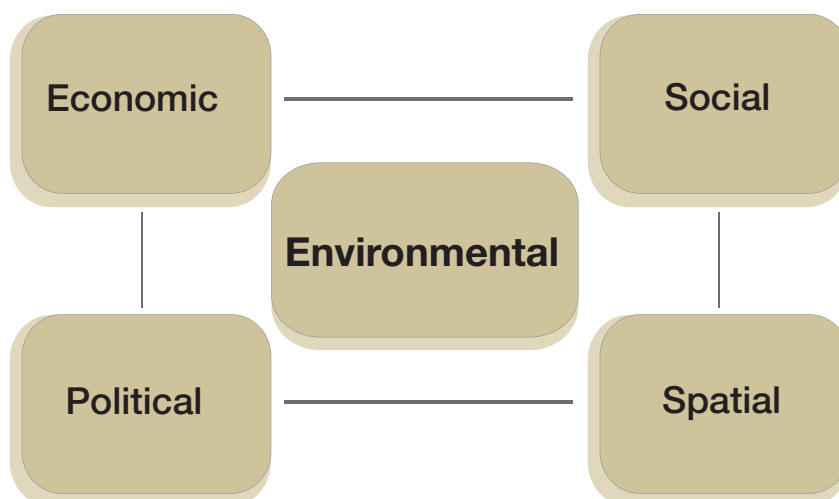
4.1 Broad Components or Dimensions

We saw in Section 3 that the construction of composite indicators is often based on the choice of broad dimensions or components. These allow for the choice of specific indicators to be justified as well as to structure and organise them into readily comprehensible analytical categories. At a higher level of abstraction, these dimensions or ‘pillars’ reflect the theoretical framework within which a multidimensional concept is measured. The same consideration applies to the measurement of inclusive growth.

In AfDB’s formulation, inclusive growth is formulated in terms of four such broad components: economic, social, spatial and political (AfDB, 2013). Similarly, the ADB has classified its inclusive growth concept within the following thematic construct or pillars: (a) income and non-income poverty and inequality; (b) creation-of-opportunities; (c) access-to-opportunities; (d) social protection; and (e) good governance and institutions.

Figure 1 shows an alternative classification which brings together five such components: economic, social, political, spatial and environmental dimensions. Each of these encompasses pertinent aspects of growth that can make growth inclusive or otherwise through the choice of appropriate sub-indicators as discussed in the next section.

Figure 1: Broad Dimensions of Inclusive Growth



¹² The HDI switched to geometric mean in 2010 although this is less intuitive than the arithmetic mean approach on which it was originally based.

4.2 Selection of Indicators

Next we further refine the components in Figure 1 above by further unpacking the first two components (Economic and Social) into narrower (sub-)dimensions. The Economic pillar now captures growth and jobs, and the Social pillar health, education, social protection and gender. We thus arrive at a more disaggregated set of ten components in Table 5 below. Of these the first seven dimensions refer to socio-economic pillars and the rest capture political, spatial and environmental dimensions. Next, a comprehensive list of 30 detailed performance indicators are drawn up to capture the various aspects of inclusive growth.

Although this gives us a useful checklist for measuring and monitoring inclusive growth, in practice real choice is constrained by data availability. With this in mind, in Table 6 we refine the list down to eight broad components and a total of 14 individual indicators. Data sources – indicated in the same table – are mostly from the World Bank’s Development Indicators (WDI) with a few others – GII, EPI and CPI –

themselves composite indices on gender inequality, environmental performance and corruption perception, respectively.

Apart from considerations of data availability, the indicators are also selected carefully to obtain a more holistic estimation of inclusive growth. They are mainly output indicators with the exception of two input indicators that are explained and justified below. Data used refer not to individual indicator values or scores but to country rankings obtained and normalised (re-scaled between 0 and 100) to take into account variations in the total number of countries for which ranks are obtained. Further, to smooth out annual fluctuations in individual ranks, five-year averages are used for the two sub-periods of 2001-05 and 2006-10 deliberately chosen because of their proximity to the events leading to the Arab uprisings in the region. This analysis can be easily updated to reflect developments the next quinquennial period (2011-15) when full data become available in due course. Further, due to data gaps, for some indicators (such as ‘Gender Inequality’ and ‘Inequality & Poverty’), we have used data as close to these periods as possible.

Table 5: Conceptualising Inclusive Growth

Broad Dimensions	Performance Indicators
1. Growth	1. GDP per capita (in PPP) 2. GDP growth rate 3. GDP per capita growth rate
2. Labour Force & Employment	4. Employment status (formal/informal) 5. National unemployment rate 6. Youth unemployment rate
3. Health and Demographic	7. Life expectancy 8. Infant mortality (under 5) 9. Public health expenditure
4. Education	1. Female to male enrolment ratios 2. Public spending on education
5. Safety Nets and Distribution	12. Income distribution (Gini index) 13. Poverty (headcount ratio) 14. Intergenerational disparities in income and wealth 15. Welfare and social security
6. Social Cohesion	16. Youth inclusion 17. Ethnic/national inclusion 18. Racial and religious harmony and tolerance
7. Gender	19. Female/male access to education 20. Female labour force participation rates 21. Female shares in parliament
8. Environment	22. Air quality 23. Water resources 24. Forests 25. Biodiversity and habitat 26. Energy sustainability 27. CO2 emissions
9. Spatial Aspects	28. Regional disparities in per capita income and wealth 29. Regional disparities in unemployment (rural/urban and coastline/mainland)
10. Governance	30. Transparency International Index

A brief discussion of each of the eight broad components used and the justification for their inclusion is given below.

Growth: Real per capita GDP growth is included to capture economic performance taking into account population growth. As a sensitivity analysis, GDP growth rate was also considered but we decided to drop it due to very high correlation with the per capita GDP growth rate values. GDP per capita itself is also not included here since our focus is on performance rather than on the level of income or size of a country's economy as such.

Labour Force and Employment: Three indicators are included to reflect on the structure of employment and to capture the scope and

extent of job creation. The first – the wage and salaried as % of total employment – indicates the extent to which those employed are located in the formal sector and are covered by contracts rather than working in family units or as self-employed. The other two indicators – adult and youth employment-to-population ratios – refer to the proportion of a country's population which are employed. These two are proxies for the extent of national and youth unemployment rates in a country. The data used here, taken from the World Bank's Development Indicators, come from ILO's modelled estimates for each country. This was necessary as the national estimates for both these indicators (also available from the Development Indicators) suffered from many missing data points.

Table 6: Selected Indicators for Computation of Inclusive Growth Index

Components (C _k)	Individual Indicators (s _j)	No of countries for which data is available (m _j)		Data Source
		2001- 05	2006-10	
Growth	1. Real per capita GDP Growth	152	153	WDI
Labour Force & Employment	2. Wage & Salaried (% of total employment)	121	112	WDI
	3. Employment-to-Population Ratios (% of 15+)	153	153	WDI
	4. Employment-to-Population Ratios (% of 15-24)	153	153	WDI
Health & Demographics	5. Life Expectancy at Birth	153	153	WDI
	6. Mortality Rate Under-5 (per 1,000)	152	153	WDI
	7. Public Health Expenditure (% GDP)	153	153	WDI
Education	8. Ratio of Female to Male Secondary Enrolment (%)	153	138	WDI
	9. Public Spending on Education (% of total)	132	138	WDI
Gender	10. Gender Inequality Index (GII)	133	134	GII
Environment	11. Environmental Performance Index (EPI)	152	152	EPI
Inequality & Poverty	12. Gini Index	97	88	WDI
	13. Poverty Gap at \$2 a day	95	85	WDI
Governance	14. Corruption Perception Index (CPI)	144	152	CPI
Total Number of Countries in the Dataset		153	153	

Sources: WDI (2014); GII (2014b); EPI (2014) and Transparency International (2014) for the CPI (Corruption Perception Index)

Gender: To capture the gender aspects of inclusivity, we rely on a composite index – Gender Inequality Index (GII) – which was introduced by the UNDP in 2010 as a substitute for its traditional Gender-related Development Index (GDI; see Section 3 above). GII shows 'the loss to potential achievement in a country due to gender inequality'. It uses a number of carefully chosen indicators to 'reflect

women's reproductive health status, their empowerment and labour market participation relative to men's' (GII, 2014a and b). Due to data limitations, we have used back-casted data for the years 2000 and 2005 to obtain an average for the period 2000-2005 and data for 2005 and 2010 to get an average for the period 2005-10, respectively.

Environment: Here too we use another composite index – Environmental Performance Index (EPI) – to capture the various and multi-faceted aspects of a country’s environmental performance. As with gender, there is no shortage of composite indicators (see Section 3 above for details). EPI is preferred to other composite indicators due to its focus on performance (rather than selected aspects of climatic change or environmental risk) and concern with outcomes rather than policies or inputs. EPI uses a number of detailed indicators to measure performance across two broad categories of: Environmental Health (with a weight of 40%) and Ecosystem Vitality (with a weight of 60%; see Hsu et al, 2013 for details of the methodology and weightings used). The former focuses on health impacts (child mortality in the age range 1-5), air quality and access to water and sanitation (See Hsu et al, 2013 for details of the methodology and weightings used). The latter (Ecosystem Vitality) embraces such indicators as water resources (wastewater treatment), agriculture (subsidies and pesticides regulation), forests (change in forest cover), fisheries (coastal shelf fishing pressure and fish stock), biodiversity and habitat (protected areas) and climate and energy (CO2 emissions per unit GDP and from electricity and heat production). Due to data limitations we have used an average for the period 2002-05 and 2006-10 respectively for each of two periods under consideration in our study (2001-05 and 2006-10).

Inequality and Poverty: Inequality is measured by the Gini index and poverty by poverty gap at \$2 a day (PPP). The latter reflects the depth as well as incidence of poverty and is measured as the mean shortfall from the poverty line, expressed as a percentage of the poverty line. Both measures are available from the World Bank’s Development Indicators although coverage is limited to 85-97 countries in our dataset only.

Governance: Finally, governance is also represented through a composite index – the Corruption Perception Index (CPI) – which is produced annually by Transparency International. This index ranks countries according to perception of corruption in the public sector based on different assessments and business opinion surveys relating to the administrative and political aspects of corruption. The questions used to compile the index relate to ‘bribery of public officials, kickbacks in public procurement, embezzlement of public funds, and questions that probe the strength and effectiveness of public sector anti-corruption efforts’ (Transparency International, 2014). Scores are assigned on a scale from 10 (very clean) to 0 (highly corrupt). Considering that CPI is perception based, it is not suitable for trend analysis or for monitoring changes in the perceived levels of corruption over time for all countries. However, due to data limitations, we have included this index for the period 2001-10 to capture governance rankings for different countries. In practice, there is a lot of variation in the number of countries for which an index is available over time with coverage rather much more limited in earlier years but improving noticeably for the more recent ones. Period averages for 2001-05 and 2006-10 are therefore worked out taking into account missing values for individual years and countries.

4.3 Missing Values

The selection of indicators as well as countries included in our dataset (153 in total) reflects careful consideration of data availability. As stated above, most indicators are readily available from standard sources such as the World Bank’s Development Indicators. However, availability decreases noticeably for some indicators such as the Gini index and Poverty Gap as well as for the Wage & Salaried (as % of total employment; see Table 6 above).

Table 7: Missing Values for 'Inclusive Growth' Indicators, 2001-05 and 2006-10

	2001-05	2006-10	Total Missing Data Points	
			N°	% of Total
North Africa				
Algeria	Poverty; Inequality	Poverty; Inequality	4	1.3
Egypt	-	-	0	0
Libya	Public Spending on Education; Wage & Salaried; Poverty; Inequality	Public Spending on Education; Wage & Salaried; Poverty; Inequality	8	2.6
Morocco	-	-	0	0
Tunisia	-	-	0	0
GCC States				
Bahrain	Poverty; Inequality	Poverty; Inequality	4	1.3
Kuwait	Poverty; Inequality	Poverty; Inequality	4	1.3
Oman	Poverty; Inequality; GII	Poverty; Inequality; GII	6	2
Qatar	Poverty	Poverty	2	0.6
Saudi Arabia	Poverty; Inequality; Wage & Salaried	Poverty; Inequality; Wage & Salaried	6	2
UAE	Female enrolment; Public Spending on Education; Poverty; Inequality	Female enrolment; Public Spending on Education; Poverty; Inequality	8	2.6
Other Middle East				
Iran		Poverty; Inequality	2	0.6
Iraq	Public Spending on Education; Wage & Salaried; Poverty; Inequality	Public Spending on Education; Wage & Salaried	6	2
Israel	Poverty	Poverty; Inequality	3	0.98
Jordan	Public Spending on Education	Public Spending on Education	2	0.6
Lebanon	Poverty; Inequality; GII	Poverty; Inequality; GII	6	2
Syria	-	Poverty; Inequality	2	0.6
Turkey	-	-	0	0
Yemen	-	Poverty; Inequality	2	0.6

Sources: Author's calculations (see Appendix Table 1)

Availability also varies over time with data missing for certain periods for different countries. Table 7 below summarises missing data for the 14 indicators used for each of the MENA countries for both the 2001-5 and 2006-10 sub-periods. It can be seen that in North Africa, the gaps are most serious for Libya (with eight missing data points) and, to a lesser extent, for Algeria (with four missing data points). This is in sharp contrast with Egypt, Tunisia and Morocco all of which have full datasets in this regard. Elsewhere, the UAE and Oman lead with the biggest data gaps (with eight and six missing data points, respectively) followed by Iraq and Lebanon (each with six missing data points).

In general, missing data reduce the estimation accuracy. This is specially an issue for the Inclusive Growth index since the gaps for 'Poverty & Inequality' indicators seem widest, which are arguably at the centre of any such computations. The results therefore have to be interpreted carefully.

4.4 Aggregation

Additive or multiplicative aggregation methods have been much discussed in the literature and are widely used (see, Garriga and Foguet, 2010; Sullivan and Jemmali, 2014). A multiplicative method computes an overall inclusive score for each country (IG_i) as a geometric mean of all its different indicators (equation 1), rescaled into standardised values (equation 2):

$$IG_i = \sqrt[n]{S_{1i} \cdot S_{2i} \dots S_{ji}} \quad (1)$$

where:

($i = 1, \dots, m$: country i included in the dataset);

($j = 1, \dots, n$: indicator j included in the dataset). As shown in Table 6, $m=153$ countries and $n=14$ indicators in our dataset.

S_{ji} is a standardised score for the rankings obtained in respect of indicator j for country i . Standardised scores are obtained using the following formula (for indicator j for each country i):

$$S_{ji} = 100 \cdot \left(\frac{m_j - r_j}{m_j - 1} \right) \quad (2)$$

where r_j is a country's rank in respect of indicator j in (descending order) and m_j is the total number of countries for which data for indicator s_j is available. This takes into account the variable number of countries for which data is available for specific indicators. In general, data limitations reduce country coverage for some variables such as inequality and the structure of employment (percentage of the wage and salaried in total employment) and, to a lesser extent, gender inequality (GII). It is arguable that missing data of this nature could bias the rankings in favour of less developed countries in which disparities in these areas are more serious.

The arithmetic mean approach, however, is more intuitive which is why we have adopted it in this study too (Hakimian 2013, used the geometric mean method). This can be computed by averaging the sum of the normalised values for each indicator s_j for country i , each component and each indicator within that component are equally weighted.

$$IG_i = \sum_{j=1}^m W_j \cdot S_{ji} \quad (3)$$

where:

($i = 1, \dots, m$: country i included in the dataset), $m=153$ countries;

($j = 1, \dots, n$: indicator j included in the dataset).

The difference between the present study and the last paper (Hakimian 2013) goes beyond the calculation method and includes differences in data coverage as well as the choice of indicators and the dimensions of inclusive growth. The previous study used a database of 193 countries and comprised 13 indicators. This paper has streamlined the database to include a selection of 153 countries for which key data are available and for which missing data could be minimised (see Section 4.3 above). We use 14 indicators based on a broader choice of dimensions and categories. The additional dimensions used are: 'Environment', 'Gender' and 'Inequality'. The two approaches also differ in that the earlier paper used three-year moving averages for 2000-02 and 2008-10, respectively, whereas the current one uses five-year averages for 2001-05 and 2006-10 to better capture changes over the decade before the Arab uprisings.

Table 8: Aggregation Methods Based on Different Indicator Weights

Components (C _k)	Individual Indicators (s _i)	Weights (%)
Growth	1. Real per capita GDP Growth	12.5
Labour Force & Employment	2. Wage & Salaried (% of total employment)	4.17
	3. Employment-to-Population Ratios (% of 15+)	4.17
	4. Employment-to-Population Ratios (% of 15-24)	4.17
Health & Demographics	5. Life Expectancy at Birth	4.17
	6. Mortality Rate Under-5 (per 1,000)	4.17
	7. Public Health Expenditure (% GDP)	4.17
Education	8. Ratio of Female to Male Secondary Enrolment (%)	6.25
	9. Public Spending on Education (% of total)	6.25
Gender	10. Gender Inequality Index (GII)	12.5
Environment	11. Environmental Performance Index (EPI)	12.5
Inequality & Poverty	12. Gini Index	6.25
	13. Poverty Gap at \$2 a day	6.25
Governance	14. Corruption Perception Index (CPI)	12.5
Total		100

Notes: * Equal weights for all indicators ($w_i = 1/14 = 7.15\%$)

** Equal weights are assigned to each component ($=1/8 = 12.5\%$) and then to each indicator within that component depending on the number

The index is computed with equal weights applied to all components (1/8) which is then equally spread between each indicator within that component. This results in $w_k = \frac{1}{8} = 12.5\%$ for 'single indicator' components such as 'Growth', 'Gender', 'Environment', and 'Governance'. For the three indicators under 'Health & Demographics' and 'Labour Force & Employment' weights are smaller: $w_j = \frac{1}{8 \times 3} = 4.17\%$. Similarly, a weight of 6.25% applies to the two indicators making up 'Education' and 'Inequality & Poverty'.

4.5 Data Exploration

Before proceeding to compute the IG index, we conduct an exploratory data analysis to examine possible relationships between the selected indicators. Tables 9.1 and 9.2 offer Pearson Correlation matrices for the 14 indicators in our analysis for both periods. Values indicating high correlations (in excess of 0.70) are highlighted in bold for ease of reference.

It can be seen that some indicators have high Pearson correlations with others. This is particularly evident for some of the composite indices used such as GII, EPI and CPI. For instance, GII which indicates gender inequality shows a very high and positive correlation with life expectancy, child mortality, structure of employment (% of wage & salaried), EPI, poverty gap and CPI. Some of this could be due to possible overlap between composite indices as they are typically made of a number of sub-indicators. For instance, GII is constructed from the following:

- Maternal mortality ratio
- Adolescent fertility rate
- Population with at least secondary education, female/male ratio
- Shares in parliament, female/male ratio
- Labour force participation rate, female/male ratio.

Here the most obvious or direct possible overlap with our chosen indicators is the female/male secondary education ratio (we use enrolment ratios). However, it is much more likely that, indirectly, many

of these indicators are influenced strongly by other factors not present in our selection, most notably the level of economic development and per capita income levels, which no doubt affect the country rankings in our dataset.

Similarly, as we saw in Section 3 above, EPI is constructed from a total of 20 indicators which centre around two principal components: (a) improving environmental health and (b) promoting ecosystem vitality and sound natural resource management. A close examination of these indicators reveals no direct or evident overlap with those used for calculating GII (see Hsu et al, 2013 for details)¹³. Again, a more credible cause for these high Pearson correlations is likely to do with the level of income and development level attained in different countries.

There is a remarkable similarity in the computed Pearson correlations between the different indicators over the two periods in our study, suggesting that the correlations are enduring and not period-specific.

¹³ The only exception is Child Mortality (under-5), which also features in our selection of indicators. The overall weight for this indicator in the construction of EPI is 13% (against 7.15% under Method 1 and 4.17% under Method 2 in our calculations – see Table 8 above).

Table 9.1: Pearson Correlation Matrix for Indicators of Inclusive Growth (2001-05)

	GDP per capita	Life Expectancy	Child Mortality Rate	Public Health Expenditure	Wage & Salaried	Employment to- Population (15+)	Employment to- Population (15-24)	Female/ Male Enrollment	Public Spending on Education	GII	EPI	Gini Index	Poverty Gap	CPI
GDP per capita	1.00													
Life Expectancy	-0.09	1.00												
Child Mortality Rate	-0.03	0.94	1.00											
Public Health Expenditure	-0.09	0.59	0.67	1.00										
Wage & Salaried	-0.10	0.76	-0.86	0.64	1.00									
Employment/ Population (15+)	-0.13	-0.27	-0.30	-0.27	+0.31	1.00								
Employment/ Population (15-24)	-0.21	-0.16	0.24	-0.13	-0.28	0.87	1.00							
Female/ Male Enrollment	0.01	0.46	0.51	0.43	0.46	-0.27	-0.27	1.00						
Public Spending on Education	-0.05	-0.25	0.38	0.51	0.49	-0.21	-0.16	0.29	1.00					
GII	0.15	0.83	0.89	0.66	0.78	-0.13	-0.06	0.47	0.32	1.00				
EPI	0.01	0.85	0.91	0.62	0.82	-0.27	-0.21	0.47	0.34	0.82	1.00			
Gini Index	0.54	0.14	0.26	0.02	0.25	-0.29	-0.32	-0.19	0.00	0.32	0.22	1.00		
Poverty Gap	0.29	0.77	0.88	0.47	0.85	-0.60	-0.62	0.44	0.25	0.76	0.82	0.38	1.00	
CPI	-0.18	0.72	0.78	0.67	0.78	-0.14	-0.03	0.40	0.49	0.72	0.76	0.02	0.52	1.00

Source: Author's calculations.

Table 9.2: Pearson Correlation Matrix for Indicators of Inclusive Growth (2006-10)

	GDP per capita	Life Expectancy	Child Mortality Rate	Public Health Expenditure	Wage & Salaried	Employment to- Population (15+)	Employment to- Population (15-24)	Female/ Male Enrollment	Public Spending on Education	GII	EPI	Gini Index	Poverty Gap	CPI
GDP per capita	1.00													
Life Expectancy	-0.24	1.00												
Child Mortality Rate	-0.29	0.93	1.00											
Public Health Expenditure	-0.28	0.53	0.61	1.00										
Wage & Salaried	-0.45	0.66	-0.81	0.55	1.00									
Employment/ Population (15+)	-0.04	-0.25	-0.31	-0.23	-0.17	1.00								
Employment/ Population (15-24)	-0.11	-0.15	0.24	-0.06	-0.08	0.87	1.00							
Female/ Male Enrollment	-0.08	0.42	0.44	0.30	0.21	-0.25	-0.26	1.00						
Public Spending on Education	-0.29	-0.26	0.35	0.57	0.40	-0.22	-0.11	0.23	1.00					
GII	-0.30	0.83	0.90	0.62	0.75	-0.13	-0.07	0.34	0.35	1.00				
EPI	-0.31	0.85	0.90	0.58	0.76	-0.29	-0.22	0.42	0.34	0.82	1.00			
Gini Index	0.16	0.05	0.17	-0.07	0.19	-0.33	-0.34	-0.20	0.05	0.13	0.07	1.00		
Poverty Gap	0.08	0.74	0.88	0.39	0.81	-0.60	-0.63	0.51	0.22	0.76	0.83	0.34	1.00	
CPI	-0.36	0.73	0.77	0.65	0.67	-0.15	-0.07	0.36	0.40	0.75	0.75	-0.12	0.46	1

Source: Author's calculations.

5. Computations and Results

Table 10 presents a summary of our estimated scores for the 'Inclusive Growth Index' (IG) for the five North African countries for the periods 2001-05 and 2006-10 along the lines explained above. It also compares them with similar data computed for a select number of Middle Eastern countries (including the GCC states) and other developing country peers. A number of interesting patterns emerge here.

First with the exception of Tunisia, all North African countries underperform internationally considering that they appear in the lower median of all countries (on a scale of 0 to 100). In North Africa, Tunisia is followed by Egypt with Algeria and Morocco coming at the bottom of the pecking order for both periods (Libya's results have to be taken cautiously given the missing data discussed above).

Tunisia (with scores for both periods over 60) overtakes the index for China, Chile, Russia, Israel and even South Korea (Tunisia has in fact the highest estimated score among the selected countries reported in this Table).

A second observation concerns the IG performance trend over the whole decade. Here, the calculation seems to suggest that Algeria's IG index deteriorated whereas the other four countries either improved

or maintained their scores between 2001-05 and 2006-10. In both periods, Egypt did best followed by Morocco and Tunisia.

We can gain more insight by examining the data more closely for other Middle Eastern and developing countries. Amongst the GCC states, Saudi Arabia, followed by Oman, appear to have been least inclusive in both periods. In terms of performance over time, Bahrain and Kuwait did badly over the two periods. By contrast, Oman showed the greatest improvement.

Elsewhere in the Middle East, Iran, Syria and Yemen recorded a deteriorating trend. The biggest improvement is recorded by Iraq between the two periods indicating the difficulties and challenges of the early years of the war period after 2003. For most Middle Eastern countries the IG index suffered. The worst performer was Yemen which saw between 30%-40% deterioration in its IG index.

Among other LDCs, too, a number of interesting results emerge. Among BRICS, China and Brazil are the strongest performers and indicate appreciable improvement in their IG score over the periods under study under both methods. This is in sharp contrast to South Africa, Russia and India, where the record is mixed. Somewhat surprisingly perhaps, Malaysia records a deteriorating trend over the two periods.

Table 10: Estimated 'Inclusive Growth' Scores, 2001-05 and 2006-10, Normalised Ranks (min=0; max=100)(a)

	2001-05	2006-10	Change (%)
North Africa			
Algeria	35.9	32.1	-10.6
Egypt	43.3	46.7	+7.9
Libya	34.1	34.3	+0.6
Morocco	43.8	44.9	+2.5
Tunisia	61.4	62.3	+1.5
GCC States			
Bahrain	49.0	45.7	-6.7
Kuwait	56.8	40.3	-29.0
Oman	31.2	41.0	+31.4
Qatar	46.7	56.5	+21.0
Saudi Arabia	35.5	40.8	+14.9
UAE	41.0	44.6	+8.8
Other Middle East			
Iran	44.0	32.2	-26.8
Iraq	11.1	25.4	+128.8
Israel	59.8	61.9	+3.5
Jordan	52.9	54.0	+2.1
Lebanon	29.2	36.8	+26.0
Syria	49.6	33.4	-32.7
Turkey	45.0	46.9	+4.2
Yemen	27.9	16.9	-39.4
Selected LDCs			
China	49.6	55.0	+10.9
Chile	59.2	58.1	-1.9
Brazil	45.3	50.4	+11.3
India	34.3	36.2	+5.5
Indonesia	37.4	40.2	+7.5
South Korea	59.5	59.4	-0.2
Malaysia	68.4	59.0	-13.7
Mexico	49.2	51.4	+4.5
Russia	57.2	50.4	-11.9
South Africa	36.8	41.7	+13.3
Top 5 Countries			
	2001-05	2006-10	
1	Iceland	Slovakia	
2	Slovenia	Poland	
3	Sweden	Sweden	
4	Estonia	Iceland	
5	Hungary	Denmark	
Bottom 5 Countries			
	2001-05	2006-10	
153	Iraq	Chad	
152	Congo, Dem. Rep.	Eritrea	
151	Liberia	Guinea	
150	Afghanistan	Sierra Leone	
149	Togo	Yemen	

Note:

(a) Based on Normalised Country Rankings for indicators specified in Table 6. Mean values of ranks estimated are based on arithmetic means (for details and methodology, see Appendix Tables 1 & 2)

Sources: Author's estimates based on data from WDI (2014); GII (2014b); EPI (2014) and Transparency International (2014) for the CPI (Corruption Perception Index) as specified in Appendix Tables 1 & 2

The general picture emerging here seems to suggest that oil economies experienced deterioration in their IG scores over the period 2001-05 and 2006-10. Amongst these the most notable ones are: Algeria, Libya, Bahrain, Kuwait, Iran and Russia. At the high end of the IG index, the same table also indicates that Scandinavian countries have well performed (Iceland, Sweden and Denmark). Some East European countries showed a strong perform (Slovakia and Poland).

Interesting contrasts also arise between the results of the present study and that reported in my previous paper (Hakimian 2013). In the latter, all North African countries were found to have attained an improvement in their IG index. By contrast, this study indicates a different picture for Algeria which, as we saw above, has recorded a fall in its index. Moreover, whereas both studies confirmed that Iran and Syria were among the few MENA countries that experienced a reduction in their growth

inclusivity, the present study sheds further light on the oil economies' experience as a whole, which – as mentioned above – fare badly between 2001 and 2010 (Kuwait, Bahrain, Iran and Algeria in particular). Another interesting contrast emerges in the case of Yemen, which showed improvement in the previous study but records a big drop under both methods used in the current study, as reported above. It goes without saying that we consider the findings of the present study as being more robust since it extends the scope, coverage and methodology of the last study considerably.

Table 11 gives the North African countries' overall position in inclusive growth international rankings. Morocco and Egypt are ranked around 80 with an improvement between the two periods. Algeria and Libya are ranked beyond 100. Tunisia does even better coming in the top 30 countries globally with others at a safe distance behind.

Table 11: Inclusive Growth Ranks for North African Countries, 2001-05 and 2006-10

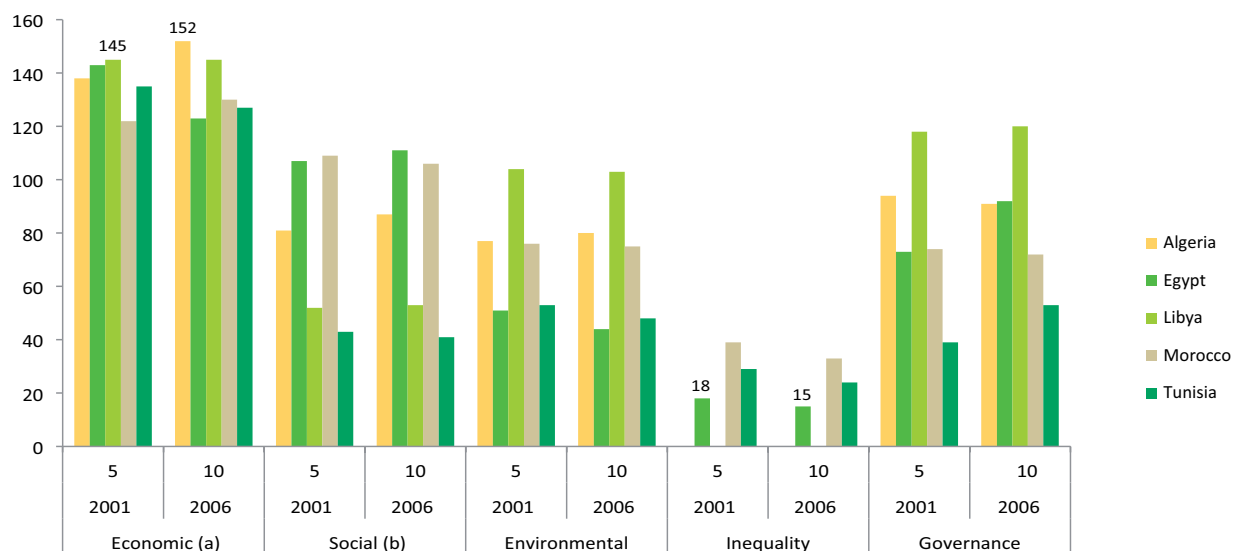
	2001-05	2006-10
Algeria	106	122
Egypt	84	74
Libya	116	114
Morocco	82	78
Tunisia	29	20

Sources: Author's estimates (see Appendix Table 3)

Figure 2 breaks down this broad picture into the components or dimensions of inclusive growth underpinning our calculations. These are: Economic (growth and the labour market indicators); Social (health

and demographic, education and gender indicators); Environmental (EPI); Inequality (Gini and poverty gap indicators) and Governance (CPI). In this case the same weight is given to the various sub-indices.

Figure 2: Comparative Performance in Components of Inclusive Growth, North African Countries, 2001-05 and 2006-10



Notes:

- a. Includes these indicators from Tables 6 and 8: GDP per capita growth and Labour Force & Employment (Wage & Salaried as % of total employment); Employment-to-Population Ratios, % of 15+; and Employment-to-Population Ratios, % of 15-24).
- b. Includes these indicators from Tables 6 and 8: Health & Demographics (Life Expectancy at Birth; Mortality Rate Under-5, per 1,000); and Public Health Expenditure, % GDP; Education (Ratio of Female to Male Secondary Enrolment, %; and Public Spending on Education, % of total) and Gender (GII).

Source: Author's calculations

It can be seen that the 'Economic' aspect of these countries' performance puts them at an unfavourable comparative position internationally: Algeria's is the worst at near bottom (ranked 152 out of 153), followed by Libya (at 145) with others lower than 120. As we shall see this is mainly due to inferior performance in labour market indicators (structure of labour market and jobs creation). Comparative performance improves in respect of other components with Tunisia again performing best. Perhaps ironically the performance of the three countries for which data is available (Egypt, Morocco and Tunisia) is best in respect of the 'Inequality' component coming in the top one-third of international rankings. Somewhat ironically, Egypt comes on top positioned only 15 globally in terms of this component in 2006-10 (from 18 in 2001-05).

The next section takes a closer look at relative performance of these countries by focusing on individual indicators and offering a more detailed sensitivity analysis of these.

5.1 Sensitivity Analysis and Policy Relevance

Figures 3.1 and 3.2 offer sensitivity analysis for the 14 indicators we used in the construction and estimation of our IG indices for 2001-05 and 2006-10. In these figures, a baseline of 100% indicates no change

and each data point shows the re-estimated IG if a particular indicator were to be excluded from the calculations (given a weight of zero). Figures above 100% (baseline) indicate the indicator has a negative effect on the overall index since its elimination (as shown in these figures) will improve the index. The opposite is true of figures below 100% (i.e., they have an overall positive effect over the IG index since their elimination lowers the IG score).

The results here reinforce our earlier findings in respect of the broad components of inclusive growth. In general, the employment indicators which defined the 'Economic' component (especially employment-to-population ratios) have the largest (negative) impact in all these five countries. This is especially true of Algeria and Libya.

On the other hand, we see again that the inclusion of the inequality indicator (Gini) improves Egypt's overall performance. By contrast, almost all five countries do well in respect of the education indicators whose elimination lowers their IG index (this is especially pronounced in the case of Libya and Algeria). Last but not least, Morocco shows a more varied pattern since its IG index shows sensitivity to the structure of employment as well which indicates a smaller percentage of wage workers (and more family workers) in its labour force.

With regards to policy, as shall see below, critics of composite indicators are wary of hasty conclusions based on ‘mechanically constructed’ composite indicators as they can be misleading for policy purposes. The value-added of such composite indicators is, ultimately, in their ability to capture real performances. With regards to our findings above, two points stand out with policy implications in the North African context. First, as is widely known, labour market issues (job creation and lowering

especially youth unemployment) remain a key challenge and the principal route to achieving inclusive growth. Second, the performance of these countries (with the exception of Tunisia) is consistently lack-lustre across a wide range of dimensions and it would require a concerted effort to improve their inclusive growth track record. A focus on one or two selective dimensions will not be sufficient to improve their comparative ranks. Both these are born out also by the earlier study (Hakimian, 2013).

Figure 3.1: Inclusive Growth Sensitivity Analysis (2001-05)

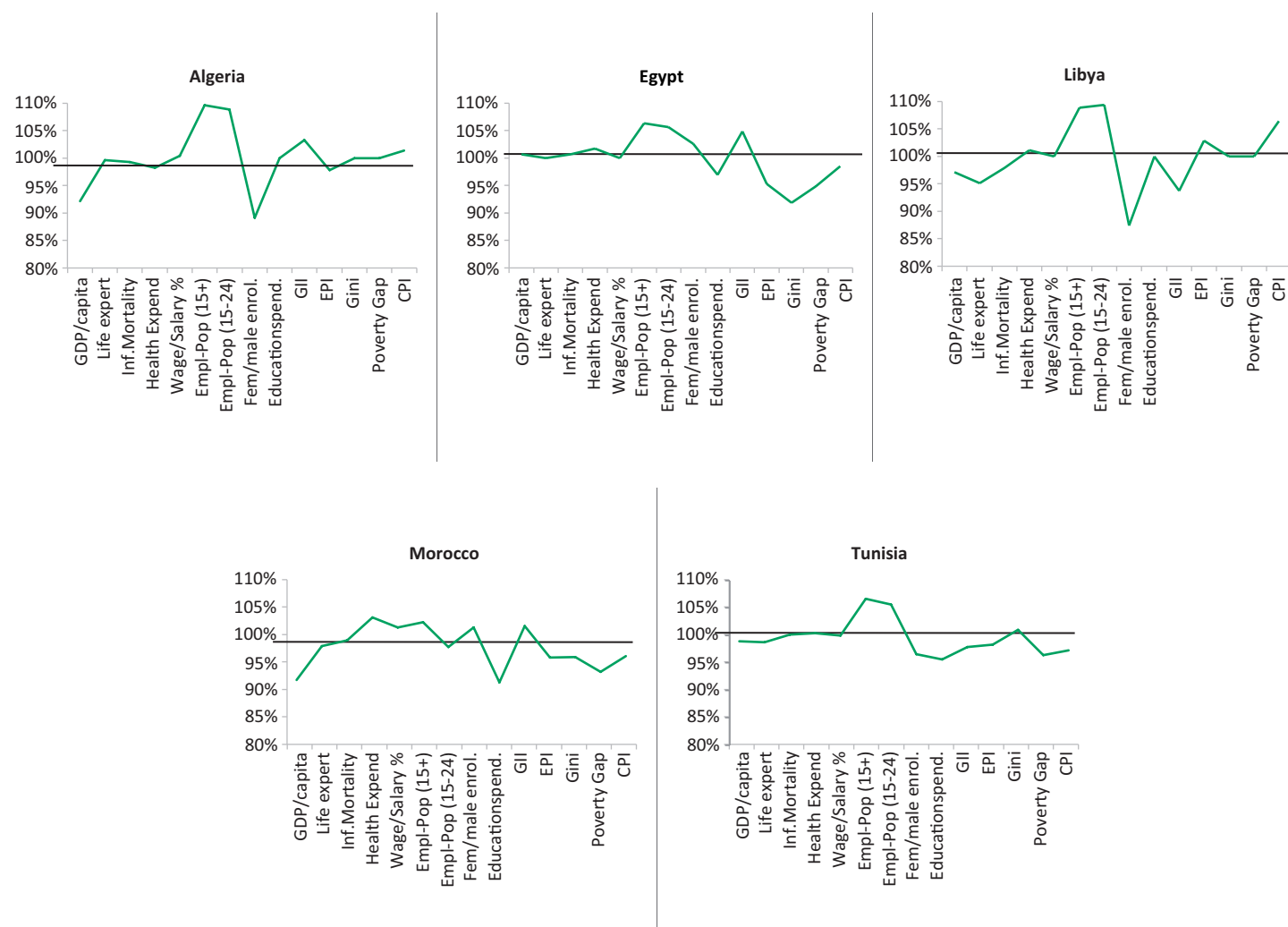
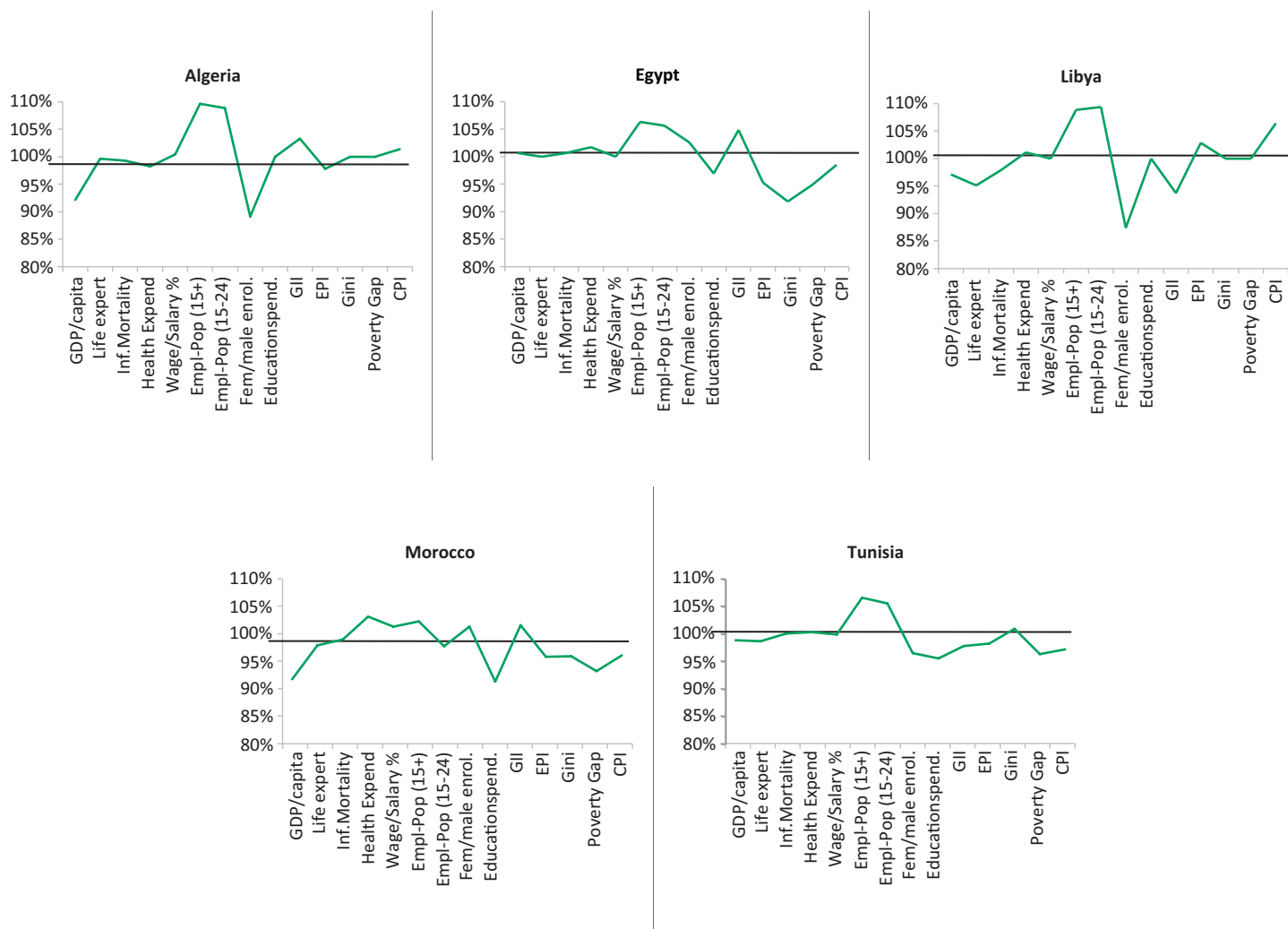


Figure 3.2: Inclusive Growth Sensitivity Analysis (2006-10)



Source: Author's calculations based on Inclusive Growth computations as in Appendix Tables 1 and 2. Figures above 100% as baseline indicate a particular indicator has a negative effect on the overall IG score and hence its elimination (as shown in these figures) will increase the index. The opposite is true of figures below 100% (i.e., the particular indicator has an overall positive effect on the IG score if its elimination pushes IG below 100%).

5.2 Uses and Limitations

We have so far offered a review of composite indicators utilised in a variety of fields (Section 3) and applied our own methodology to estimate such as index for inclusive growth for different countries over the two periods of 2001-05 and 2006-10. Our methodology was based on an aggregate average ranking of 153 countries in total in 14 selected areas combining growth with other dimensions such as health and demographics, labour markets, gender, environment and governance. The choice of the two sub-periods was informed by a desire to understand the nature of growth experience in these countries in the

decade leading to the Arab uprisings. The results for North African countries were presented in Section 5.

As we have seen, the main virtue of composite indicators is their ability to summarise complex processes in an efficient way to benchmark country performances. But such a 'virtue' may be also perceived a disadvantage, which is why it lies at the heart of the controversy over their uses (and abuses).

Table 12 below summarises the main pros and cons for composite indicators. It can be seen that the perceived advantages are mainly to

do with the parsimony in the use of data and its presentation: on one hand, they help summarise complex data by providing a short cut to many separate indicators and on the other hand they make the task of assessing and monitoring country performances, across countries or

over time, easier. As such they have a strong policy appeal and tend to be popular with policy makers who can use composite indicators to set targets and to communicate easily and effectively with the public over holistic topics.

Table 12: Pros and Cons of Composite Indicators

<ul style="list-style-type: none"> • Can summarise complex or multi-dimensional issues in view of supporting decision-makers 	<ul style="list-style-type: none"> • May send misleading policy messages if they are poorly constructed or misinterpreted
<ul style="list-style-type: none"> • Easier to interpret than trying to find a trend in many separate indicators 	<ul style="list-style-type: none"> • May invite simplistic policy conclusions
<ul style="list-style-type: none"> • Facilitate the task of ranking countries on complex issues in a benchmarking exercise 	<ul style="list-style-type: none"> • May be misused, e.g., to support a desired policy, if the construction process is not transparent and lacks sound statistical or conceptual principles.
<ul style="list-style-type: none"> • Can assess progress of countries over time on complex issues 	<ul style="list-style-type: none"> • The selection of indicators and weights could be the target of political challenge.
<ul style="list-style-type: none"> • Reduce the size of a set of indicators or include more information within the existing size limit 	<ul style="list-style-type: none"> • May disguise serious failings in some dimensions and increase the difficulty of identifying proper remedial action
<ul style="list-style-type: none"> • Place issues of country performance and progress at the centre of the policy arena 	<ul style="list-style-type: none"> • May lead to inappropriate policies if dimensions of performance that are difficult to measure are ignored.
<ul style="list-style-type: none"> • Facilitate communication with general public (i.e. citizens, media, etc.) and promote accountability 	

Source: Nardo et al (2005: 8)

Critics are, on the other hand, concerned that the quality of data used and estimation methods applied may mask important issues and lead to poor or inappropriate policy options. Two broad areas of criticism have emerged.

On one hand, some have taken up issues with the near obsession with country rankings (the so-called ‘tyranny of international index rankings’) that emanates from the estimation and use of composite indicators. From this perspective, too much faith is placed on the accuracy of these rankings. Allowing for uncertainty, for instance, Høyland et al (2012) have shown that the link between rankings and indicators on one hand and real performance on the other might in fact be very ‘fuzzy’ (2012: 2). Their discussion of three common and widely used composite indicators (Doing Business, the Human Development Index and Freedom House) shows that the rankings in the top and bottom ends are more stable but the middle 80% are subject to considerable uncertainty (2012: 8). For these authors too much reliance on ‘mechanically constructed’ indicators can be misleading for policy purposes since they are poor proxies for capturing real performance.

Another line of criticism has been articulated by those concerned with the value-added of these ‘mashed up’ indices in offering real policy insight. Ravallion (2010) acknowledges their appeal in ‘collapsing multiple dimensions into just one, yielding unambiguous country rankings,’ but warns that their ‘meaning, interpretation and robustness are often unclear’ (2010: 2) especially compared to monitoring the components of what has been termed ‘a large and eclectic dashboard’ of separate indicators (Stiglitz et al, 2009, p.62). Each one of the key indicators on a car’s dashboard (for instance, fuel level, oil pressure and battery level) convey important data about the car’s roadworthiness and safety in their own right. Hence, mashing up all of these into a single index as a general indication of a car’s ‘well-being’ would not be helpful (Ncube et al, 2013: 14). By analogy, policy makers will be better off considering the dashboard of all the development indicators that go into a single policy index. Two problems have been identified in this respect.

The first and main problem is ascribed to the lack of a clear and sound aggregation function often resulting in ‘a composite index for which the producer is only constrained by the availability of data in choosing

what variables to include and their weights' (Ravallion, 2010: 3). We encountered this issue above in our discussion of the choice of appropriate dimensions, sub-indicators within them and problems involved in the choice of weights. Since there is no consensus over these, the computations methodology and assumptions made have to be made very clear and transparent and the results have to be interpreted with care and caution.

The second possible drawback is that country rankings – while useful at times in terms of focusing minds – can also encourage 'rank-seeking

behaviour'. This happens when countries focus on specific components of the index in which they are doing poorly as a way of improving their 'performance' in the ranking tables (Høyland *et al.*, 2010).

Despite these legitimate concerns, however, even the hardest critics of composite indicators do not favour their complete abandonment. As articulated by Ravallion, the main lesson is probably 'that the current enthusiasm for new mashup indices needs to be balanced by clearer warnings for, and more critical scrutiny from, users' (2010: 30).

6. Summary and Conclusions

This paper has contributed to the recent debates on inclusive growth by offering, and applying, a methodology for calculating a single composite index for inclusive growth for a database consisting of 153 countries for two periods in the past decade: 2001-5 and 2006-10. The choice of these two periods was guided by interest in understanding the dynamics and nature of growth in the decade before the recent political upheavals in the Arab world. The results for North African countries were presented and discussed in comparison with other peers in the MENA region as well as some other selected emerging economies.

In general North African countries underperformed internationally and appeared in the lower median of rankings for all countries.

Tunisia (with scores for both periods rising over 60) overtakes the index for China, Chile, Russia, Israel and South Korea.

In the wider Middle Eastern context, oil economies in general performed worst.

Last but not least and with regards to policy relevance, we have to heed the warnings of those who have cautioned against hasty

conclusions based on 'mechanically constructed' composite indicators as they can be misleading for policy purposes. As we have seen, the value-added of such composite indicators is, ultimately, in their ability to capture real performances. In the North African context, two points stand out with relevant policy implications. First, labour market issues (job creation and lowering especially youth unemployment) remain a key challenge and a principal route to achieving inclusive growth. Second, the performance of these countries (with the exception of Tunisia) is consistently lack-lustre across a wide range of dimensions and it would require a concerted effort to improve their inclusive growth track record. A focus on one or two selective dimensions will not be sufficient to improve their comparative ranks.

To conclude, it should be emphasised that the methodology used here should be viewed as a starting point for estimation of a single inclusive growth estimator. Both the choice of indicators selected for our purposes and weights attached to them are unlikely to meet with universal approval. Nevertheless, the methodology developed and offered here is flexible enough to incorporate other variations both for the choice of indicators and weights applied. In that respect, it is hoped that this approach will encourage wider methodological debate and can prove useful in stimulating attempts at operationalising this important concept.

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Appendix

Table 1: Inclusive Growth Scores Based on Country Rankings for Selective Indicators (averaged for 2001-05)

	Growth	Health & Demographics			Labour Force & Employment			Education	
	Real per capita GDP Growth	Life Expectancy at Birth	Mortality Rate Under-5 (per 1,000)	Public Health Expenditure (% GDP)	Wage & Salaried (% of total employment)	Employment-to-Population Ratios (% of 15+)	Employment-to-Population Ratios (% 15-24)	Ratio of Female to Male Secondary Enrolment (%)	Public Spending on Education (% of total)
North Africa									
Algeria	42	89	86	80	74	151	146	21	
Egypt	95	90	95	104	71	142	136	98	56
Libya	70	59	75	94		140	143	12	
Morocco	44	93	101	135	95	128	92	106	35
Tunisia	60	58	73	77	57	147	135	30	20
GCC States									
Bahrain	145	39	46	88	4	56	96	8	
Kuwait	34	52	48	91	2	30	101	63	25
Oman	127	51	51	87		113	122	90	77
Qatar	109	31	43	98	1	13	50	25	125
Saudi Arabia	124	55	57	76		125	152	100	12
UAE	149	40	39	125	3	16	61		
Other Middle East									
Iran	36	86	85	110		145	126	96	57
Iraq	110	88	98	141		153	149	122	
Israel	139	8	23	37	19	116	128	72	14
Jordan	45	67	74	42	36	149	147	40	
Lebanon	142	34	56	65	64	141	134	32	114
Syria	68	48	64	105	84	135	113	99	46
Turkey	55	74	83	62	80	139	103	115	105
Yemen	107	115	117	107	75	146	119	132	4
Other LDCs									
China	6	56	84	123		22	25	93	
Chile	63	26	38	75	58	114	132	55	88
Brazil	104	80	80	72	63	48	34		75
India	27	113	115	147	108	80	64	112	96
Indonesia	56	96	103	149	99	54	74	73	109
South Korea	38	28	25	84	61	65	110	69	71
Malaysia	71	57	35	118	46	62	66	23	9
Mexico	134	42	65	89	62	81	52	48	58
Russia	19	104	60	69	7	88	100	71	90
South Africa		131	111	67	37	143	150	28	48
Rank out of	152	153	152	153	32	153	153	153	132
Missing Countries	1	0	1	0	121	0	0	18	21
Total Countries	153	153	153	153	153	153	153	153	153

**Table 1 Cont'd: Inclusive Growth Index Based on Country Rankings for Selective Indicators
(averaged for 2001-05)**

	Gender	Environment	Labour Force & Employment		Governance	Inclusive Growth Index (IG _i) ^(a) (max = 100, min = 0)
	Gender Inequality Index (GII)	Environmental Performance Index (EPI)	Gini Index	Poverty Gap at \$2 a day	Corruption Perception Index	
North Africa						
Algeria	97	77				35.9
Egypt	113	51	15	30	73	43.3
Libya	44	104			118	34.1
Morocco	106	76	49	35	74	43.8
Tunisia	42	53	53	20	39	61.4
GCC States						
Bahrain	43	58			29	49.0
Kuwait	70	63			41	56.8
Oman		93			27	31.2
Qatar		39			34	46.7
Saudi Arabia	126	37			59	35.5
UAE	108	17			31	41.0
Other Middle East						
Iran	95	81	37	22	87	44.0
Iraq	133	125			132	11.1
Israel	25	34	42		23	59.8
Jordan	104	52	39	23	38	52.9
Lebanon		73			87	29.2
Syria	91	57	26	29	69	49.6
Turkey	79	70	60	24	76	45.0
Yemen	132	134	35	52	105	27.9
Other LDCs						
China	6	56		22	25	49.6
Chile	63	26	58	114	132	59.2
Brazil	104	80	63	48	34	45.3
India	27	113	108	80	64	34.3
Indonesia	56	96	99	54	74	37.4
South Korea	38	28	61	65	110	59.5
Malaysia	71	57	46	62	66	68.4
Mexico	134	42	62	81	52	49.2
Russia	19	104	7	88	100	57.2
South Africa		131	37	143	150	36.8
Rank out of	133	152	97	95	144	153
Missing Countries	20	1	56	58	9	0
Total Countries	153	153	153	153	153	153

Source: Author's calculations

Notes:

^(a) The overall inclusive scores for each country (I_i) are computed as a geometric mean for that country of the standardised values for different indicators (defined below) according to the following formula:

$$I_i = \sum_{j=1}^m w_j \cdot s_{ij}$$

where: $(i = 1, \dots, m$: country i included in the dataset);
 $(j = 1, \dots, n$: indicator j included in the dataset); and

s_{ij} is a standardised score for the rankings obtained in respect of indicator j for country i . These standardised scores are obtained using the following formula (for each indicator for each country):

$$s_{ij} = 100 \cdot \left(\frac{m_j - r_j}{m_j - 1} \right)_i$$

where r_j is a country's rank in respect of indicator j in (descending order) and m_j is the total number of countries for which data for indicator s_j is available. Methods 1 & 2 are explained in Table 8 above.

Sources: WDI (2014); GII (2014b); EPI (2014) and Transparency International (2014) for the CPI (Corruption Perception Index).

The following countries have been excluded from the World Bank's ranking tables mainly for data reasons:

1.	American Samoa	22.	Hong Kong SAR	43.	Solomon Islands
2.	Andorra	23.	Isle of Man	44.	Somalia
3.	Antigua and Barbuda	24.	Kiribati	45.	South Sudan
4.	Aruba	25.	Korea, Dem. Rep.	46.	St. Kitts and Nevis
5.	Bahamas	26.	Kosovo	47.	St. Lucia
6.	Bermuda	27.	Liechtenstein	48.	St. Martin (French part)
7.	Brunei Darussalam	28.	Macao	49.	St. Vincent and the Grenadines
8.	Cayman Islands	29.	Marshall Islands	50.	Sudan
9.	Channel Islands	30.	Micronesia	51.	Suriname
10.	Comoros	31.	Monaco	52.	Timor-Leste
11.	Curacao	32.	Myanmar	53.	Tonga
12.	Djibouti	33.	New Caledonia	54.	Turkmenistan
13.	Dominica	34.	Northern Mariana Islands	55.	Turks and Caicos Islands
14.	Equatorial Guinea	35.	Palau	56.	Tuvalu
15.	Faeroe Islands	36.	Papua New Guinea	57.	Uzbekistan
16.	French Polynesia	37.	Puerto Rico	58.	Vanuatu
17.	Greenland	38.	Samoa	59.	Virgin Islands (U.S.)
18.	Grenada	39.	San Marino	60.	West Bank and Gaza
19.	Guam	40.	Sao Tome and Principe	61.	Zimbabwe
20.	Guinea-Bissau	41.	Seychelles		
21.	Haiti	42.	Sint Maarten (Dutch part)		

Table 2: Inclusive Growth Scores Based on Country Rankings for Selective Indicators (averaged for 2006-10)

	Growth	Health & Demographics			Labour Force & Employment			Education	
	Real per capita GDP Growth	Life Expectancy at Birth	Mortality Rate Under-5 (per 1,000)	Public Health Expenditure (% GDP)	Wage & Salaried (% of total employment)	Employment-to-Population Ratios (% of 15+)	Employment-to-Population Ratios (% 15-24)	Ratio of Female to Male Secondary Enrolment (%)	Public Spending on Education (% of total)
North Africa									
Algeria	117	89	87	88	100	148	137	30	76
Egypt	35	91	91	117	72	137	127	85	95
Libya	71	56	71	132		138	140	4	
Morocco	47	93	100	130	91	131	107	111	38
Tunisia	51	57	73	81	58	143	135	19	15
GCC States									
Bahrain	148	42	48	89	3	50	96	69	113
Kuwait	151	60	50	120		34	108	58	96
Oman	39	46	55	124	2	108	114	99	85
Qatar	97	34	43	119	1	4	10	2	129
Saudi Arabia	49	51	54	97		124	153	105	34
UAE	153	40	45	134	4	17	44		
Other Middle East									
Iran	54	80	81	101	82	147	130	87	64
Iraq	53	98	103	91		152	146	124	
Israel	74	1	23	47	20	109	117	53	27
Jordan	44	71	82	35	35	149	144	43	
Lebanon	15	31	51	83	70	138	136	55	133
Syria	96	50	63	129	75	145	123	66	60
Turkey	86	67	67	55	74	141	106	109	119
Yemen	106	116	117	136	63	146	118	132	53
Other LDCs									
China	2	53	68	116		27	38	49	
Chile	79	28	44	84	54	107	115	45	97
Brazil	57	79	69	68	66	48	35		40
India	11	114	114	150	107	96	82	108	106
Indonesia	37	94	101	152	99	55	77	60	111
South Korea	52	21	19	72	59	73	124	72	69
Malaysia	76	58	39	127	49	83	84	73	65
Mexico	115	39	66	90	65	77	56	28	62
Russia	46	104	57	71	7	75	91		88
South Africa	121	139	115	67	34	142	150	38	39
Rank out of	153	153	153	153	112	153	153	138	138
Missing Countries	0	0	0	0	41	0	0	15	15
Total Countries	153	153	153	153	153	153	153	153	153

Table 2 Cont'd: Inclusive Growth Scores Based on Country Rankings for Selective Indicators (averaged or 2006-10)

	Gender	Environment	Labour Force & Employment		Governance	Inclusive Growth Index (IG _i) ^(a) (max = 100, min = 0)
	Gender Inequality Index (GII)	Environmental Performance Index (EPI)	Gini Index	Poverty Gap at \$2 a day	Corruption Perception Index	
North Africa						
Algeria	91	80.0			91	32.1
Egypt	113	44.0	10	30	92	46.7
Libya	44	103.0				34.3
Morocco	89	75.0	49	32	72	44.9
Tunisia	48	48.0	32	26	53	62.3
GCC States						
Bahrain	42	71.0			37	45.7
Kuwait	43	69.0			35	40.3
Oman		92.0			36	41.0
Qatar	100	39.0	50		24	56.5
Saudi Arabia	127	34.0			58	40.8
UAE	67	22.0			29	44.6
Other Middle East						
Iran	98	83.0			113	32.2
Iraq	129	129.0	11	34	129	25.4
Israel	23	36.0				61.9
Jordan	99	54.0	28	16		54.0
Lebanon		77.0				36.8
Syria	101	58.0			120	33.4
Turkey	75	63.0	45	23	54	46.9
Yemen	134	136.0			27	16.9
Other LDCs						
China	33	101.0	54	48	68	55.0
Chile	60	30.0	77	24	22	58.1
Brazil	72	72.0	81	39.0	66	50.4
India	120	134.0	21	64		36.2
Indonesia	96	98.0	27	59	72	40.2
South Korea	10	42.0				59.4
Malaysia	40	45.0	66	11		59.0
Mexico	68	62.0	70	22	74	51.4
Russia	50	67.0	53	3	131	50.4
South Africa	79	74.0	88	51	46	41.7
Rank out of	134	152	88	68	152	
Missing Countries	19	1	65	85	1	
Total Countries	153	153	153	153	153	153

Source: Author's calculations.
Notes and Sources as for Appendix Table 1

**Table 3: Country Rankings for Inclusive Growth Composite Indices
(2001-05 and 2006-100)**

	2001-05	Labour Force & Employment
Afghanistan	150	144
Albania	57	50
Algeria	106	122
Angola	138	130
Argentina	69	36
Armenia	64	53
Australia	16	10
Austria	24	12
Azerbaijan	97	83
Bahrain	63	77
Bangladesh	113	107
Barbados	53	67
Belarus	48	49
Belgium	30	39
Belize	67	96
Benin	127	143
Bhutan	100	66
Bolivia	104	80
Bosnia and Herzegovina	91	98
Botswana	79	71
Brazil	73	64
Bulgaria	23	14
Burkina Faso	101	115
Burundi	143	123
Cambodia	109	113
Cameroon	135	140
Canada	20	19
Cape Verde	94	72
Central African Republic	145	132
Chad	132	153
Chile	38	41
China	61	51
Colombia	65	69
Congo, Dem. Rep.	152	148
Congo, Rep.	141	142
Costa Rica	34	17
Cote d'Ivoire	142	145
Croatia	14	22
Cuba	41	29
Cyprus	32	33
Czech Republic	25	32
Denmark	10	5
Dominican Republic	78	68
Ecuador	83	81

	2001-05	Labour Force & Employment
Egypt, Arab Rep.	84	74
El Salvador	90	82
Eritrea	146	152
Estonia	4	43
Ethiopia	103	118
Fiji	76	103
Finland	7	8
France	35	27
Gabon	131	147
Gambia, The	140	141
Georgia	110	105
Germany	40	13
Ghana	114	97
Greece	42	76
Guatemala	125	116
Guinea	147	151
Guyana	122	125
Honduras	108	104
Hungary	5	25
Iceland	1	4
India	115	112
Indonesia	98	94
Iran, Islamic Rep.	81	121
Iraq	153	133
Ireland	18	28
Israel	36	24
Italy	51	58
Jamaica	68	88
Japan	31	31
Jordan	56	54
Kazakhstan	58	57
Kenya	136	138
Korea, Rep.	37	34
Kuwait	46	93
Kyrgyz Republic	95	85
Lao PDR	89	110
Latvia	12	18
Lebanon	123	109
Lesotho	112	111
Liberia	151	128
Libya	116	114
Lithuania	11	16
Luxembourg	21	44
Macedonia, FYR	99	95
Madagascar	139	137
Malawi	124	124
Malaysia	13	37

	2001-05	Labour Force & Employment
Maldives	75	89
Mali	133	135
Malta	52	40
Mauritania	144	139
Mauritius	66	61
Mexico	62	59
Moldova	47	47
Mongolia	55	70
Montenegro	86	55
Morocco	82	78
Mozambique	105	120
Namibia	70	84
Nepal	121	108
Netherlands	19	6
New Zealand	9	11
Nicaragua	87	106
Niger	148	136
Nigeria	137	146
Norway	6	9
Oman	120	90
Pakistan	130	134
Panama	54	45
Paraguay	118	92
Peru	72	60
Philippines	88	100
Poland	22	2
Portugal	33	30
Qatar	71	48
Romania	45	42
Russian Federation	43	63
Rwanda	93	86
Saudi Arabia	107	91
Senegal	111	127
Serbia	59	56
Sierra Leone	134	150
Singapore	27	26
Slovak Republic	8	1
Slovenia	2	21
South Africa	102	87
Spain	26	35
Sri Lanka	80	62
Swaziland	129	126
Sweden	3	3
Switzerland	17	7
Syrian Arab Republic	60	117
Tajikistan	96	102
Tanzania	117	99

	2001-05	Labour Force & Employment
Thailand	44	46
Togo	149	131
Trinidad and Tobago	49	101
Tunisia	29	20
Turkey	74	73
Uganda	119	119
Ukraine	39	52
United Arab Emirates	92	79
United Kingdom	15	23
United States	28	38
Uruguay	50	15
Venezuela, RB	85	75
Vietnam	77	65
Yemen, Rep.	128	149
Zambia	126	129
Total Number of Countries	153	153

Notes: Figures refer to individual country ranks for computed Inclusive Growth Index out of 153 countries (see Appendix Tables 1 & 2 for methodology)

Source: Author's calculations

