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## Rethinking the measurement of the middle class

Evidence from Egypt

Khalid Abu-Ismaïl<sup>1</sup> and Niranjana Sarangi<sup>2</sup>

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**Abstract:** The degree of choice households have over their consumption expenditure is critical in deciding their economic class. Applying our measure to Egyptian household budget surveys, we estimate the population size of the middle class in Egypt and assess their well-being in the period 1995-2011. Our findings show that if economic growth is pro-poor and inclusive, more people at the lower end of income distribution will graduate into the middle class category. The increase in poverty rates and decline in the size of the middle class since 2005 indicates that the growth process in Egypt was anti-poor and anti-middle class.

**Keywords:** consumption expenditure; inequality, measurement, middle class, poverty

**JEL classification:** D63, E21, I32, B41

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<sup>1</sup> Chief of Section, Economic and Globalization Division, UN-ESCWA, email: [abu-ismail@un.org](mailto:abu-ismail@un.org); <sup>2</sup> First Economic Affairs Officer, Economic and Globalization Division, UN-ESCWA, email: [sarangi@un.org](mailto:sarangi@un.org)

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## 1 Introduction

The middle class is an abstract and multidimensional concept. Embedding social and economic notions, it may be construed from a capability approach as the range of things that people do or are in life (Sen 1999). As with any other complex phenomenon, the quest for a unique measure that captures all the various aspects it embodies is an immense challenge, if not a futile endeavor. The present paper has no such ambition. The aim is to accomplish two relatively simple tasks. First, to provide a new definition of the middle class solely on the basis of the level and pattern of their consumption expenditure and, in defence of this new approach, also to review existing economic definitions of the middle class and their shortcomings. Second, using recent household expenditure surveys, it aims to apply that definition and method to measure the population size of the middle class in Egypt and assess the impact of macro level policies on their social and economic welfare from 1995 to 2011.

There are many good reasons why socioeconomic researchers should be concerned with the definition, measurement, and study of the middle class. To start with, the middle class was arguably a key driving force behind industrialization and socioeconomic development, for example in Europe in the nineteenth century (Adelman and Morris 1967; Alesina 1994; Landes 1998). An integral component of those successful development experiences was the promotion of redistributive social policies, such as expansionary fiscal policies supporting the provision of public services and infrastructure development, to benefit the poor by pulling them into the ranks of the growing middle class (Alesina and Rodrik 1994; Easterly 2001; Galor and Zeira 1993; Sridharan 2004). As the middle class consists generally of entrepreneurs, they create employment and drive productivity growth (Acemoglu and Zilibotti 1997). Middle-class citizens tend to value the accumulation of human capital and increased savings, which are critical for economic development (Doepke and Zilibotti 2005, 2008). They have the capacity to pay for higher-quality domestic products, which drives demand for consumer goods and encourages firms to invest, thus raising income levels for everyone (Murphy et al. 1989). The middle class can also be a potent force for better governance and accountability (Birdsall et al. 2000) as they are the main tax-paying class. The enlargement of the middle class should therefore lead to greater demands for government accountability and hence democratization.

The present paper also aims to assess middle-class people in Egypt, many of whom played a vital role in triggering the uprisings in 2011 and continue to influence the unfolding socioeconomic and political transitions that will shape not only the future of the country but also that of the entire Arab region for the coming decades (see *Daily Star* 2012; *The Economist* 2011; *Financial Times* 2013; Friedman 2013; Kandil 2013). Indeed the middle class in Egypt has always been central to the cultural identity and political economy of development in the Arab world. It can even be argued that the statist models of development that swept the region during the 1950s and 1960s were driven to some extent by calls for social justice led by a disenfranchised Egyptian middle class. Likewise, calls for social justice in the Egyptian revolution that began in January 2011 were consistent with a suspected sharp rise in inequality during the preceding two decades (see also the *Arab Development Challenges Report*; UNDP 2011a), which had many glaring manifestations despite the relatively low and stagnating values of common measures of income inequality. Our analysis of the socioeconomic profile of the Egyptian middle class from 1995 to 2011 also lends validity to that hypothesis.

Against this historical backdrop, it is surprising to see how little attention the issue of inequality in general and the middle class in particular has received in Egypt and the Arab region. That is not to suggest that the issue has been entirely absent from the landscape. To the contrary, studies such

as those by Ali (2009), Amin (2000, 2004), Mansour (2009), El-Mikawy (1999), Giddens and Held (1982), Goldthorpe (1996), Shechter (2009), and Springborg (1993), produced significant contributions to understanding the political economy of the middle class in Arab countries. However, that literature only partially addressed the following two fundamental questions: who are the Arab economic middle class and what has happened to them? Moreover, owing to the differences in their definitions and analytical approaches, it is quite impossible to compare those narratives across time and space.

Given that the present paper is concerned with the measurement of the distribution of income (or expenditure) across societal classes, some methodological preliminaries must first be clarified. Economists are inclined to answer questions surrounding the measurement of the size of the middle class using a money-metric yardstick. As the subject groups under examination are by definition situated in the middle, this yardstick must logically include an appropriate lower and upper threshold to measure their position in relation to members of other expenditure categories (i.e. the poorer and richer classes). However, no consensus exists among economists on how to define those thresholds, resulting in a diverse menu of measurement methodologies.

The first part of the present paper reviews those common measurement approaches, including studies such as those conducted by Banerjee and Duflo (2008), Birdsall (2007), Birdsall et al. (2000), Chun (2010), Easterly (2001), Ferreira et al. (2013), Kharas (2013), Lopez-Calva and Ortiz-Juarez (2011), and Ravallion (2009). Following the reasoning of Ali (2011), it shows that those measures yield significant differences in their estimates of population size of the middle class in Arab countries. Upon more detailed examination, it becomes clear that this result is plausible given the wide discrepancies in the lower and upper thresholds invoked in those methods. A major problem that is common in most of those measurement approaches is their reliance on purchasing power parity exchange rates, which are fundamentally flawed. In the Arab region, which includes a group of countries that is quite economically diverse, this is bound to produce biased estimates regarding the size of the middle class.

To address this major limitation of existing methodologies, the present paper adopts a different starting point. Closer to the heart of the concept of development as freedom, it views the economic middle class in terms of the degrees of freedom or choices they have in terms of consumption. More specifically, it defines the middle class of any society as a group of individuals whose level of consumption expenditure lies above an appropriately determined poverty line but whose level of consumption of non-essential goods and services is less than the value of that line. The more affluent members of society, on the other hand, can afford to spend a more generous portion of their income on items that are deemed luxurious or unnecessary relative to the basket of goods and services consumed by the more needy lower classes. They are, to use the eloquent definition of Veblen (1899), ‘conspicuous consumers’.<sup>1</sup>

The middle class can thus be distinguished from three other economic categories; the poor, or those whose expenditure lies below an appropriately defined lower poverty line; the vulnerable (near poor), or those whose expenditure places them between the lower poverty line and the upper poverty line; and a third group of more affluent consumers, whose expenditure on non-essential goods exceeds the value of the lower poverty line. In contrast to the affluent class, the middle class

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<sup>1</sup> *The Theory of the Leisure Class: An Economic Study of Institutions* (1899) by Thorstein Veblen is a detailed social critique of social-class consumerism in the United States, which proposes that the social strata and the division of labour during the feudal period continued into the modern era. While the middle and lower classes were employed in the industrial occupations that supported the whole of society, the leisure class were engaged in economically wasteful activities that did not contribute to the economy or to the material productivity required for the fruitful functioning of society.

does not adopt frivolous consumption habits and, in relation to the poor and vulnerable classes, they have a higher degree of authority over their consumption choices and enjoy a higher economic status.

Applying that definition to household survey data to identify the size of the middle class and examine their characteristics becomes relatively simple. It would also be possible to examine the impact of macroeconomic and social policies on their economic welfare and human development levels. The present paper, for the purpose of making a closer examination of the socioeconomic nexus, extends the analysis to cover another group that is typically considered by political economists and sociologists to be integral to the identity of the Arab middle class, namely the working professionals who are individuals with a higher level of education and who possess more human capital and thus social status. At their intersection, those economic and social definitions offer a far deeper understanding of the underlying dynamics that lead to the historical formation or erosion of the middle class than when analysed separately.

Following these introductory remarks, the paper is divided into two main parts. The first is mainly concerned with issues related to deficiencies in the existing economic approaches to measuring the middle class. The second begins with a delineation of our proposed method to estimate the lower and upper thresholds for measuring the middle class, which is then applied to Egyptian household expenditure surveys from 1995 to 2011. We also discuss the findings and their ramifications for the political economy of exclusion in Egypt. The paper ends with a brief summary and discussion of the implications of our approach for the design of macroeconomic policies, and offers a glimpse of our future research agenda on the middle class.

## **2 Review of common methodologies to measure the size of the middle class**

This section of the present paper has two main objectives. Section 2.1 briefly reviews recent global and regional studies proposing quantitative methods to estimate the population size of the middle class and shows the results from applying those methods to household survey data from Arab countries and developing regions. Section 2.2 assesses the major shortcomings of those methods, thus paving the way for our proposed methodology set out in the next section.

### **2.1 Results of applying various measurement methodologies**

Ravallion (2009) proposed expenditure thresholds per capita for measuring the developing world's middle class. He argued that the relevant threshold should range between households with per capita consumption at or above US\$2 a day per person (which is the median poverty line for 70 developing countries) and households at or below US\$13 a day per person (the poverty line in the United States of America). That measure implicitly advocates the notion that the middle class comprises those consuming slightly more than the World Bank's preferred poverty line of US\$1.25 per day for the developing world which Chen and Ravallion (2008) proposed.

Keeping in mind that the mean consumption varies widely across countries and developing regions, and that the US\$2 to US\$13 range does not hold well for all developing regions, other authors have proposed alternative region-specific thresholds for defining the middle class. For example, the Asian Development Bank (2010; see also Chun 2010) used a range of between US\$2 and US\$20 per day per capita (also in 2005 PPP\$ [purchasing power parity US\$]) to define the middle class in Asia (see Asian Development Bank 2010). Likewise, the African Development Bank (2011) divides the middle class in Africa into two sub-groups: a lower middle class whose income or expenditure lies between US\$2 and US\$10 per day per capita and an upper middle class whose income or expenditure lies between US\$10 and US\$20 per day. Similarly, Banerjee and

Duflo (2008) proposed two thresholds: between US\$2 and US\$4 and between US\$6 and US\$10 (per capita per day in 2005 PPP\$) (Banerjee and Duflo 2008). In line with the higher level of income, Ferreira et al. (2013), in their study on Latin American and the Caribbean, applied a much higher range of between US\$10 and US\$50 per day per capita. To measure the global middle class, Kharas (2013) applied an even higher per capita per day expenditure or income that ranged between US\$10 and US\$100. As noted earlier, that method was adopted by the 2013 Human Development Report to estimate the size of the world’s middle-class population (UNDP 2013).

Table 1: Common thresholds to measures the middle class (in 2005 PPP\$)

Source	Lower and upper threshold
Developing regions (Birdsall et al. 2000)	$i \in MC \Leftrightarrow .75*Y (P50) \leq Y_i \leq 1.25*Y (P50)$
Developing regions (Birdsall 2007)	$i \in MC \Leftrightarrow US\$10 \leq Y_i \leq Y(P90)$
Developing regions (Ravallion 2009)	$i \in MC \Leftrightarrow US\$2 \leq Y_i \leq US\$13$
Asia (Asian Development Bank 2010; Chun 2010)	$i \in MC \Leftrightarrow US\$2 \leq Y_i \leq US\$20$
	$i \in LMC \Leftrightarrow US\$4 \leq Y_i \leq US\$10$
Africa (African Development Bank 2011)	$i \in UMC \Leftrightarrow US\$10 \leq Y_i \leq US\$20$
Latin American and Caribbean (Lopez-Calva and Ortiz-Juarez 2011; Ferreira et al. 2013)	$i \in MC \Leftrightarrow US\$10 \leq Y_i \leq US\$50$
Global (Kharas 2013; UNDP 2013)	$i \in MC \Leftrightarrow US\$10 \leq Y_i \leq US\$100$

Note:  $i \in MC$  stands for an individual,  $i$ , being part of the middle class; LMC and UMC stand for lower middle class and upper middle class, respectively.  $\Leftrightarrow$  stands for ‘if and only if’;  $Y_i$  is the income of individual  $i$ ; and P50 and P90 are the fiftieth and ninetieth percentiles of income distribution, respectively.

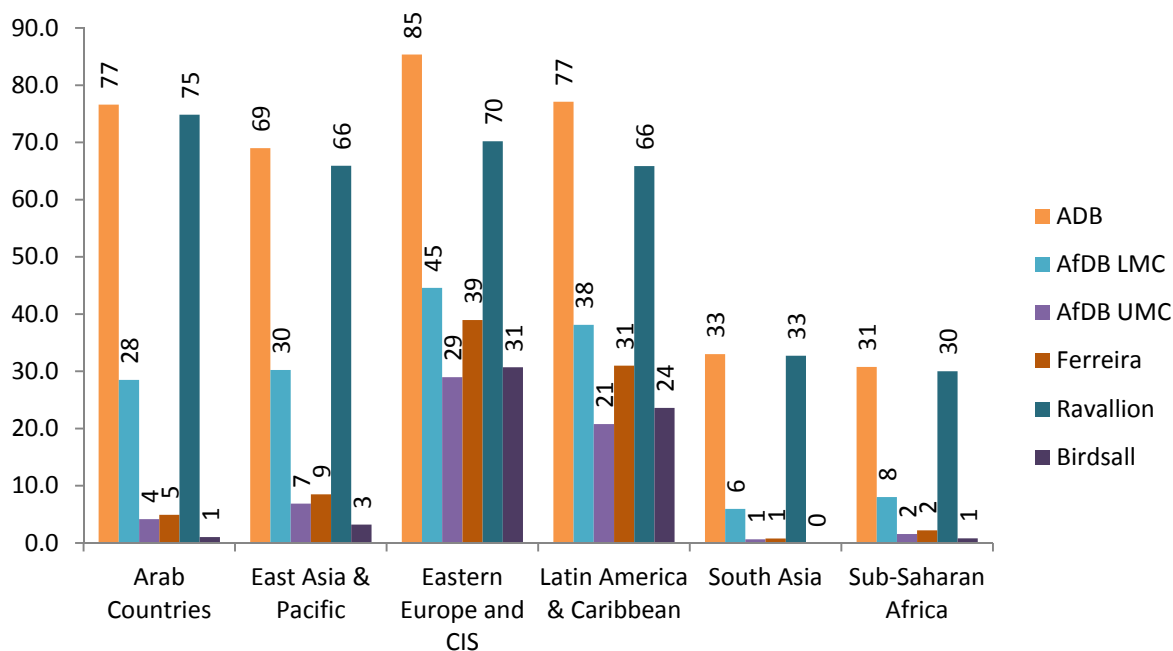
Source: Authors’ compilation.

Others have proposed a combination of both absolute and relative definitions. Birdsall (2007) defined the middle class as those who consume above US\$10 per day (PPP) but whose expenditure lay below the ninetieth percentile of the income distribution in their own country. The argument is that the US\$10 threshold represents an absolute global threshold below which people are too poor to be classified as middle class in any society, while the ninetieth percentile threshold represents a relative and local threshold above which people are at least ‘rich’ in their own society.

Given their wide range, it should not be surprising that the results from applying those thresholds also vary widely. Figure 1 summarizes the results for Arab countries and developing regions. Ravallion’s method yields a result that indicates three-quarters of the population in Arab countries are middle class, which is the highest rate among all regions of the world. Keeping the lower bound of US\$2 per day while raising the upper bound to US\$20 increases the size of the middle-class population by only 1.8 percentage points in the Arab region, 3.1 percentage points in East Asia and the Pacific, 11.2 percentage points in Latin America and the Caribbean,<sup>2</sup> and from 70.2 per cent to 85.4 per cent (highest increase) in Eastern Europe and the Commonwealth of Independent States. South Asia and Sub-Saharan Africa witness almost no change, which indicates that increasing the upper threshold hardly changes the size of the middle-class population in most developing regions while altering the lower threshold produces dramatic changes. For example, adjusting the lower threshold from US\$2 to US\$4 while maintaining the upper threshold of US\$20 leads to reduction of the middle-class population size in the Arab region from 75 to 33 per cent.

<sup>2</sup> In a study on Latin America and the Caribbean, Birdsall et al. (2011) showed that varying the upper threshold from US\$50 to US\$100 a day would move the percentile of the Latin America and Caribbean elite from the top 2.2 per cent to the top 0.5 per cent. However, moving the lower threshold would dramatically alter the percentage of excluded or included population.

Figure 1: Middle class size in developing regions based on various methods and using the most recent surveys



Source: Calculations based on data from the World Bank (2013a).

Keeping the lower threshold too high also tends to underestimate the size of the middle class in developing regions, such as the measures proposed by Ferreira et al. (2013) and Birdsall (2007), in which the lower threshold was US\$10 per capita per day. Only 4.9 per cent of the population in the region, would be included using lower and upper thresholds of US\$10 and US\$50, and only about 1 per cent of its total population using lower and upper thresholds of US\$10 and the 90th percentile respectively (see Figure 1). From the two definitions, it appears that the choice of the upper threshold does not have a significant impact on middle class size in the region if the lower threshold is kept very high. But the choice of the lower threshold may be particularly crucial for Arab countries.

Another study by Lopez-Calva and Ortiz-Juarez (2011) used a vulnerability-to-poverty approach to define the lower threshold. According to them, the middle class should ideally consist of ‘those households facing a very low risk of falling into poverty over time’.<sup>3</sup> They looked for the income level associated with that probability,<sup>4</sup> which gave the lower threshold.<sup>5</sup> They found that non-poor individuals with a 10 per cent probability of falling into poverty had income levels of US\$8.5 a day in Chile, US\$9.7 a day in Mexico, and US\$9.6 a day in Peru, all measured using the 2005 PPP\$. Hence they used a uniform level of US\$10 per day (2005 PPP\$) as the middle class lower threshold. Their choice of the upper threshold of US\$50 (2005 PPP\$) per capita per day is, however, rather arbitrary even though they justify it based on the well-established stylized fact that household surveys do not accurately capture the expenditure of the richest group of consumers in most

<sup>3</sup> The authors used the poverty line US\$4 for the selected countries in Latin America (Chile, Mexico, and Peru), which nearly corresponds to the national poverty lines of those countries.

<sup>4</sup> The authors considered it as the minimum income threshold for ‘economic security’ to avoid the risk of falling into poverty. By embedding risk in the measurement of poverty, such a measure becomes a wider concept of vulnerability that captures the welfare consequences of exposure to risk and not only that of having been subject to shocks.

<sup>5</sup> The authors considered demographic indicators, labour market resources, and shocks affecting a household.

countries (Alvaredo et al. 2013; Atkinson et al. 2011). It is likely, therefore, that many of the households in the top percentiles of household surveys are in reality part of the middle class.

Ferreira et al. (2013) adopted a more subjective approach based on self-reported class membership in a study of seven Latin American countries.<sup>6</sup> They derived the lower threshold based on the lowest income level at which most people regarded themselves as belonging to the middle class. Interestingly, the lowest income threshold at which most people identified themselves as middle class<sup>7</sup> in their study was similar to the results obtained by Lopez-Calva and Ortiz-Juarez (2011) using the probability of vulnerability-to-poverty approach (around US\$10 per day per capita). To derive the upper threshold of the middle class, the authors used the US\$50 per capita per day criterion as used by Lopez-Calva and Ortiz-Juarez (2011), justifying that threshold on the basis that household surveys tend to under-report the actual consumption of the individuals in the highest expenditure bracket. Using those thresholds (i.e. from US\$10 to US\$50 per day) showed that about 31 per cent of Latin American and Caribbean population belong to the middle class (Figure 1). Using that measure, Eastern Europe and the Commonwealth of Independent States also showed a higher percentage of middle class of 39 per cent. For all other regions, the measure yielded a tiny middle-class population. In the Arab region it was less than 5 per cent.

Ali (2011) used the national poverty line (converted into PPP\$) as a lower threshold and US\$13 per day as an upper threshold for defining the middle class in Arab countries, such as Egypt, Jordan, Morocco, Tunisia, and Yemen. In those five countries, the size of the middle class estimated according to those thresholds reached 79 per cent of the total population in the mid-2000s, a share that has been stable since the mid-1990s (see Ali 2009). That relatively high share of the middle-class population is partly the result of the relatively high value of the upper threshold (the most recent expenditure surveys show that the share of population spending US\$13 a day is only just above 0 per cent in Yemen, around 1 per cent in Egypt, 5 per cent in Morocco, and 10 per cent in Jordan and Tunisia) (World Bank 2013a). While this methodology is tailored to country-specific poverty conditions, by considering the national poverty line as a lower threshold of the middle class, it effectively leads to the inclusion of the vast majority of the non-poor population in the ranks of the middle class, but does not recognize a large section of vulnerable citizens within the non-poor population who lie between the poor and middle-class populations.

Those results can easily be explained in Figure 2, which shows that most populations in developing countries are clustered between the US\$1.25 and US\$3 per day expenditure thresholds (UNDP 2011b). The incidence curves over a range of expenditure lines (ranging from US\$0.2 to US\$10 in PPP\$), illustrate that, at any value lower than PPP\$1.25, the Arab region displays a very low incidence rate (on a par with Europe and Central Asia, and lower than Latin America and the Caribbean). Hence, if we accept that line as an appropriate threshold for poverty measurement, the region would have virtually no poverty. That rate, however, jumps sharply at higher values of the poverty line. Thus, at approximately US\$3 a day, the region's poverty rate is far closer to that of the average for all developing regions (UNDP 2011b). Therefore, using the lower bound of PPP\$2 for defining the middle class overestimates the size of middle class in the region. The

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<sup>6</sup> They used the Encuestas de Cohesión Social en América Latina (Ecosocial) survey (Valenzuela 2007). Those household surveys contained a question on social class as well as some objective measure of socioeconomic status for seven Latin American countries, namely Argentina, Brazil, Chile, Colombia, Guatemala, Mexico, and Peru. The respondents' answer to the question on class membership was divided into five categories: lower class, lower middle class, middle class, upper middle class, and upper class.

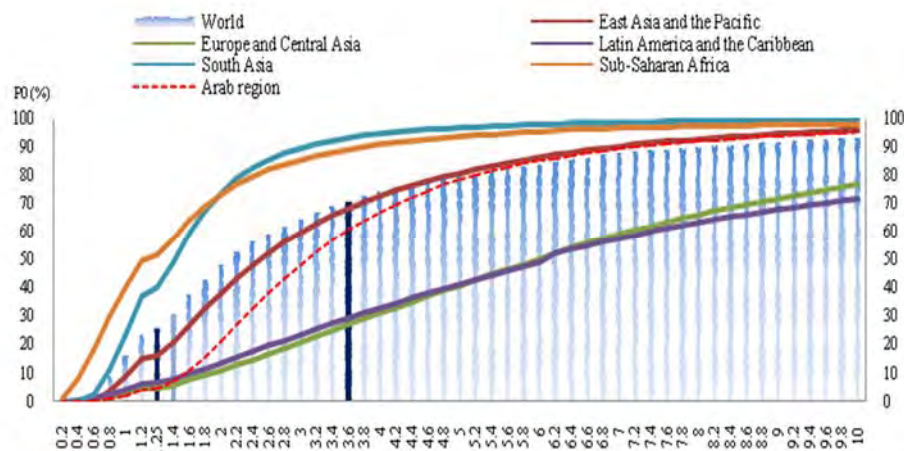
<sup>7</sup> The authors combined lower class and lower middle class into one category – lower class. They also combined middle class and upper middle class into one category – middle class (Ferreira et al. 2013).



analyses of both Ravallion (2009) and the African Development Bank (2011) suffer from that limitation.

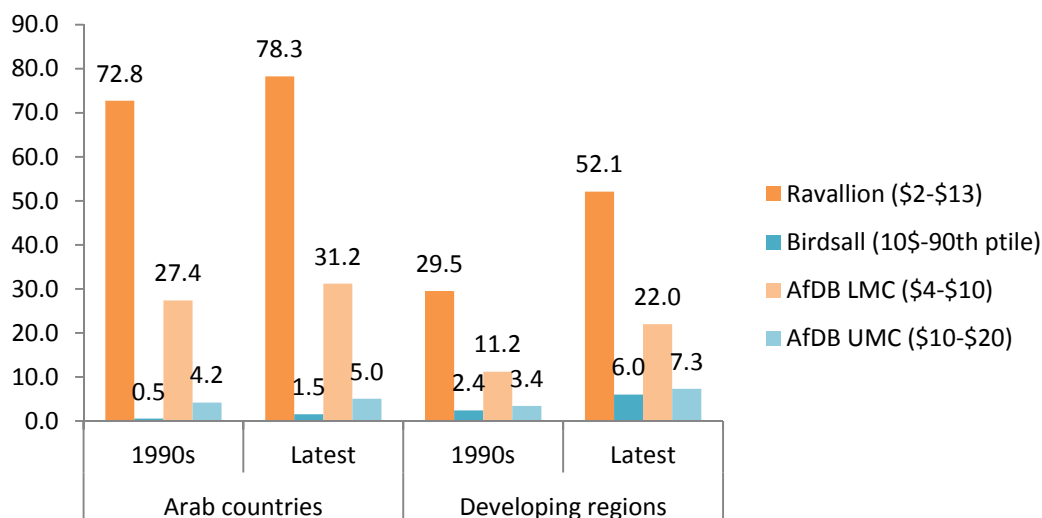
In terms of the change in the estimated size of the middle-class population, the results from applying three methods (Ravallion, Birdsall, and the African Development Bank) are shown in Figure 3 for the Arab region and developing regions. Regardless of the methodology applied, the middle class has expanded from the early 1990s to the late 2000s. This expansion was quite significant for developing regions owing mainly to the phenomenal growth in expenditure in highly populated countries such as China and India over the period, regardless of the choice of measurement methodology. For Arab countries, the estimates indicate a much lower rate of expansion (approximately 5 per cent to 10 per cent over the entire period).

Figure 2: Population distribution across a range of expenditure lines, Arab countries and developing regions on the basis of recent surveys, in 2005 PPP\$



Source: Calculations based on data from World Bank (2013a).

Figure 3: Change in middle class size for developing regions and Arab countries on the basis of surveys from 1990 to date, using various definitions



Note: AfDB – African Development Bank.

Source: Calculations based on data from World Bank (2013a).

## 2.2 Common problems associated with those methods

The previous section reviewed the results from applying relative or absolute thresholds to define thresholds of consumption expenditure that would qualify individuals to be classified as middle class. One applied relative measure includes anyone between the second, third, and fourth quintiles of income distribution within a country (Easterly 2001). Another more commonly applied relative measure includes individuals whose expenditure lies between 75 and 125 per cent of the society's median per capita income (Birdsall et al. 2000). This approach, however, has a major limitation since relative thresholds are drawn arbitrarily, without any consideration of country level or regional specificity. For example, in a low-income country the median income may lie below the nationally defined poverty line. Hence, as the authors themselves acknowledge, a relative measure does not reflect any fixed notion of the middle class, rather it provides information on the middle strata in income terms in each country (Birdsall et al. 2000). As such, it is more a measure of income distribution than the size of the middle class.

Other methods have attempted to overcome this flaw by defining the middle class using absolute measures of expenditure. As they do not face the above-mentioned problem of a varying median expenditure, their approach provides comparable estimates across countries. Absolute measures thus identify the middle class as those individuals whose expenditure lies within a specific range of consumption or income, but with the crucial assumption that it is standardized in terms of PPP. As argued below, the validity of this supposition is questionable.

There are good reasons why a fixed threshold to measure welfare should not be used. The US\$1.25 a day line, for example, does not represent the actual deprivation in many countries, especially in Arab countries.<sup>8</sup> It provides a false notion, at least based on the results of the region's national poverty assessment reports, that Arab countries have the lowest rate of poverty among all developing regions (UN and the League of Arab States 2013). This, however, is not the case for the poorest countries in the world, where the US\$1.25 line does serve as a good proxy for national poverty rates, which is expected since the line itself is estimated based on national poverty lines of the 15 poorest countries (Chen and Ravallion 2008).

The same problem applies to any attempt to measure the size of the middle class using a fixed threshold across time and space. The fixed US\$2 per day as the lower threshold for the middle class might or might not be appropriate for the poorest countries, but it is certainly not appropriate for Arab countries. National poverty lines of most Arab countries are much higher than US\$2 per day (UN and the League of Arab States 2013). Likewise, the US\$10 per day lower threshold is too high, as it is significantly above the national poverty lines of many middle-income countries.

One major flaw in 'fixing the line' is the reliance on PPP exchange rates, which, for a variety of reasons, do not show appropriate adjustment of purchasing power across countries. Deaton (2010) argued that the use of PPP exchange rates for comparison between widely different countries rests on weak theoretical foundations.<sup>9</sup> He also argued that the international comparison programmes that determine PPP rates also suffer from other problems, such as the treatment of housing, the productivity rates of government services, the urban bias in pricing, and the question of what we are doing when we match specifications so carefully. According to Reddy (2009: 11), 'the issue

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<sup>8</sup> It also understates poverty in Latin America and the Caribbean (Ferreira et al. 2013).

<sup>9</sup> Deaton (2010: 43) quotes Richard Stone (1949): 'Why do we want to compare the United States with, say, India or China? What possible interest is there in it? Everybody knows that one country is, in economic terms, very rich and another country very poor; does it matter whether the factor is thirty or fifty or what?' Sen (1973, 1976) suggested avoiding making complete orderings between countries, let alone computing the ratio-scale real income numbers on which poverty and inequality comparisons rest.

goes beyond that of the choice of base year and concerns the question of whether the commodities for which relative prices are being collected are receiving weights which are appropriate when overall PPP rates based on these prices are calculated'. Challenging the fundamental issues in using PPP rates, Deaton (2010) proposed the use of 'self-reported prices from international monitoring surveys, and for a global poverty line that is truly denominated in United States dollars'. In fact, he himself used self-reported prices from the expenditure surveys for estimating poverty in India as well as across different regions within the country.

If PPP rates have major flaws, then any international fixed line obviously provides biased estimates of the poor or the middle class.<sup>10</sup> For example, the equivalent of US\$1.25 in 2005 PPP\$ in today's Egyptian currency is below the value of the national food poverty line. However, for the poorest African countries, it will roughly approximate the value of the national poverty line, which includes basic food and non-food expenditure.

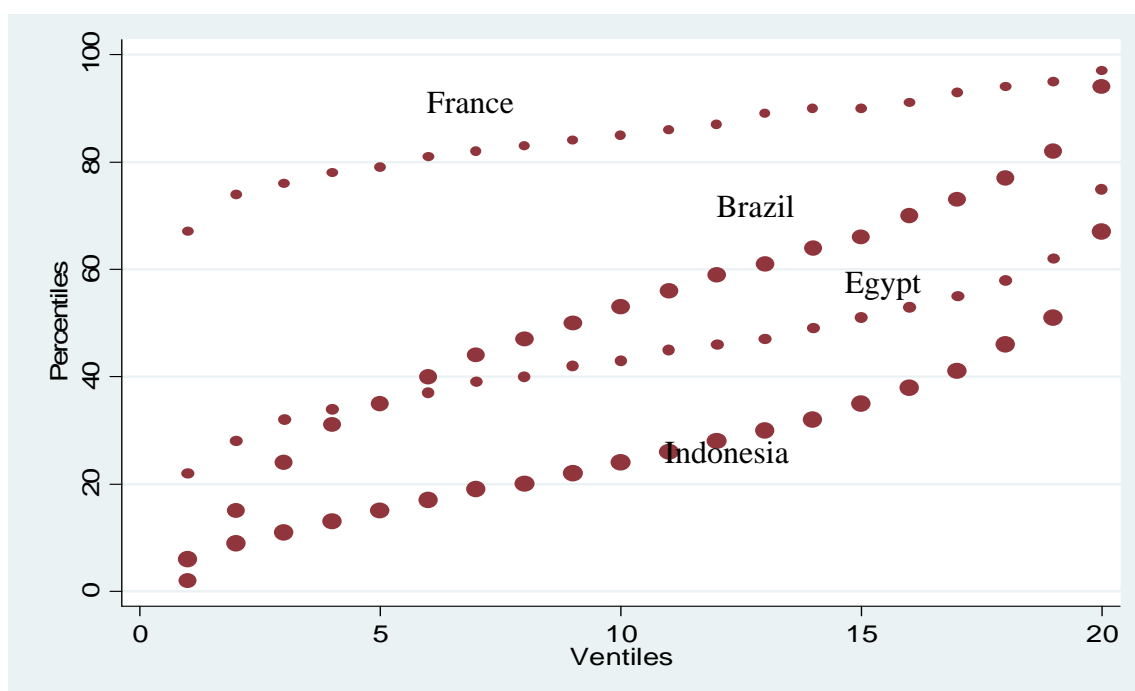
Second, the inequalities in income or expenditure per capita across and within countries as well as the overlaps across countries add another layer of complication in defining any absolute threshold for the middle class. Income inequality between countries is a significant factor that contributes to global inequality.<sup>11</sup> Milanovic (2006) illustrated that, even within a country, inequality is not a negligible factor, in both rural and urban areas, and there are overlaps between countries' distributions – some people from a poor country can be better off than some people from a rich country. He explained this situation by looking at the position of each 5 per cent of the population from the lowest to the highest in the income distribution of countries against their position in the global distribution in PPP terms (Figure 4). French income distribution spans the range between the 68th and the 97th global percentile, Egyptian distribution spans from the 22nd to the 75th global percentile, while the Indonesian distribution spans from the 6th to the 67th global percentile. There is no overlap between the French and Indonesian distributions. Hence, any fixed threshold that aims to capture the French poor or middle class will entirely miss the Indonesian middle and upper class even though a poor French family may, in real terms, incur a far higher level of deprivation from consumption and material wealth than an Indonesian upper middle-class family. This may be an extreme example but it illustrates the fundamental weakness of applying any fixed line to compare welfare, whether between countries or over time.

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<sup>10</sup> Other criticisms include: choice of rock-bottom norms of expenditure unrealistically applied to the entire world, combination of food and non-food components in a poverty line without a consistent consumer theory and limitations of the basis of national poverty lines of poorest countries which could be understated or overstated due to political reasons (Abu-Ismael et al. 2012; Kakwani and Son 2006).

<sup>11</sup> However, there are debates about global inequality widening versus world poverty declining and welfare increasing. See Bourguignon and Morrisson (2002); Milanovic (2006); Atkinson and Brandolini (2008); and Anand and Segel (2008).

Figure 4: Position of each 5 per cent (ventile) of different countries' in global income distribution



Source: Calculations based on global income inequality data for the period 1988-2005 (Milanovic 2006) and the World Bank's World Development Indicators (World Bank 2013b).

To overcome this significant weakness, the authors of regional reports opted to select lower and upper thresholds close to the mean consumption expenditure of the majority of the population in their countries. While this is bound to yield more plausible results, it will still result in major biases given that, even for regions with countries at very similar levels of per capita expenditure (which is certainly not the case for the Arab region), a fixed threshold cannot capture the differential price effects within countries, such as urban versus rural areas, which have important net welfare effects. They also fail to capture other important welfare effects that are incorporated in the estimation of national poverty lines, such as the impact of economies of scale within households when, for example, non-food items such as television and telephone services, are shared among household members.

Well aware of these problems, some experts opted to simply ask people if they considered themselves to be poor, middle class or rich. The self-reported class structure, however, is influenced by the perceived income distribution in the country. For example, the top third of Brazilians might perceive themselves as middle class in comparison to the richest families whose expenditure was seldom reported in household surveys of developing countries. That could be one reason why Ferreira et al. (2013) found that self-reported middle class status was associated with people fairly high up in the income distribution in the case of Latin America and the Caribbean. Furthermore, it would be quite impossible to compare results across countries. Therefore, self-reported methods cannot be seen as accurate methods of identifying the middle class, though they have the advantage of getting a direct answer from respondents regarding how they identify themselves. Those methods might highlight people's perceptions about their belonging to a certain class, and having certain aspirations and grievances, but it would be hard to define any society economically on the basis of self-reported perceptions. This is why surveys rely upon household consumption expenditure to identify the poor, rather than the perception of being poor or not.

### 3 Estimating lower and upper thresholds for middle class measurement on the basis of consumption patterns: Egypt

#### 3.1 Methodology in brief

The first step in any methodology to identify the middle class must address the challenge of how to isolate the poor. Following the standard methodology applied by the World Bank and the United Nations Development Programme (UNDP) in national poverty assessment reports,<sup>12</sup> we applied a household-specific food poverty line and estimated a non-food poverty line. The starting point is to choose a food bundle that reaches the predetermined calorie requirements with a composition that is consistent with the consumption behaviour of the poor, taking into account occupation, gender, and location. The cost of the required calories is then set based on the actual consumption basket of the first two quintiles. Thus, the relative quantities observed in the diet of the poor (proxied by the poorest two quintiles) and the prices they face should be maintained in constructing the food poverty line for each household in the sample (see El-Laithy 2003).

The food poverty line is augmented by an allowance for expenditure on essential non-food goods, by choosing those households that have to forego food consumption to allow for non-food expenditures, deemed a minimum indispensable level of non-food requirements. The essential non-food allowance is estimated by identifying the share of non-food expenditure for households whose total expenditure is equivalent to the food poverty line. Adding together the food poverty line and the essential non-food expenditure, we arrive at a lower poverty line. Any household that spends less than the lower poverty line is considered 'poor'.

The second step is to estimate the value of the upper poverty line so as to identify the second group of households that, though still poor, are not as deprived regarding basic consumption needs as the former group. Following the same cost-of-basic-needs method, the upper poverty line is calculated using allowances of non-food expenditures for the households whose food expenditure per capita is equal to the food poverty line (on the basis of a selected food basket for each country) (see Ravallion 1998). In other words, the household budget covers the exact cost of food needs according to the requirement and the household also has some choices of expenditure on non-food items, which might be both essential and non-essential. As the population between the lower and upper poverty lines is vulnerable to shocks and hence prone to fall into poverty, we refer to them as the 'vulnerable' group.<sup>13</sup>

The third and final step is to identify the upper threshold for middle class measurement. The upper poverty line is the minimum threshold for middle-class consumers who, as per our earlier definition, not only meet the basic necessities of food expenditure but also have more expenditure choices on non-essential food and non-food expenditure, such as on better health care and education. The middle-class consumers are thus located between the upper poverty line and what we refer to as the upper middle class line, where the household's non-essential non-food consumption per capita reaches a value equivalent to that of the lower poverty line. Households whose expenditure per capita lies above the latter line are considered to be 'affluent' consumers group.

Figure 5 illustrates the expenditure pattern of those four consumer groups. The horizontal axis is the average per capita expenditure and the vertical axis is the average expenditure on non-food

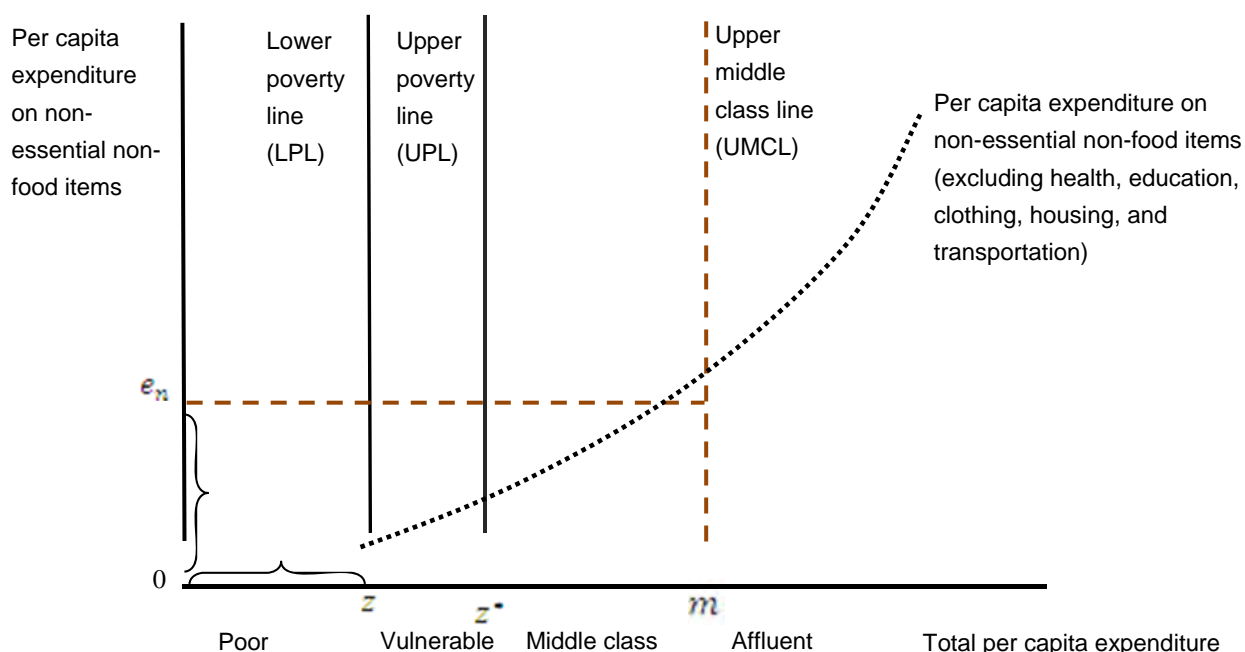
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<sup>12</sup> See UNDP (2006, 2009) for Syria, UNDP (2008) for Lebanon, World Bank (2007a, 2007b) for Egypt.

<sup>13</sup> In contrast to other studies that arbitrarily scale up the poverty line by a certain factor (e.g. by 2 per cent or by 50 per cent) to arrive at the notion of 'near poverty'.

(non-essential items). Expenditure on non-food non-essential items is an increasing function of average household income.<sup>14</sup> The scope of  $0$  to  $z$  is the lower poverty line, which measures the minimum income or expenditure per capita of households to meet basic needs.  $0$  to  $z^*$  is the upper poverty line, which also captures the vulnerable or the group having between  $z$  and  $z^*$  level of income or expenditure per capita. If the household per capita expenditure on non-essential non-food items is equivalent to the lower poverty line (between  $0$  and  $z$ ), which is the same as  $0$  to  $e_n$ , then the households between the  $z^*$  and  $m$  levels of expenditure per capita are middle class. This category of consumers includes those who not only meet the basic necessities of food expenditure but also have an additional level of expenditure on non-essential non-food expenditure.

Figure 5: Defining the middle class on the basis of consumption expenditure of non-essential goods and average per capita expenditure



Source: Authors' compilation.

It is intuitively clear from Figure 5 that any household whose expenditure lies above the  $m$  level of per capita expenditure belongs to the affluent group. It is also intuitively clear that the function representing the relationship between both variables should have an intercept to indicate that the level of consumption of non-essential goods and services is initiated, albeit meagrely, as households approach middle-class status. The large-budget households tend to spend relatively more, in per capita terms, on non-essential items than lower-budget households.<sup>15</sup> Taking this into account, the shape of the function in the illustration implies that a 1 per cent increase in total expenditure per capita increases average per capita consumption of non-essential items by more than 1 per cent.

<sup>14</sup> See the Appendix to this paper for a more technical description of the functional formulation.

<sup>15</sup> Empirical studies indicate that the expenditure elasticity of consumption of non-food items and luxury items is elastic (Agbola 2000). Also see Deaton and Muellbauer (1980) for the almost ideal demand system model.

### 3.2 Egypt: 1995-2011

In this section, we apply our methodology to Egypt using micro level data from five recent Household Income, Expenditure, and Consumption Surveys from 1995 to 2011 (Central Agency for Mobilization and Statistics 1995-2011), to estimate the value of the thresholds that we report in the following section. Using those thresholds we then review the profile of the middle class in relation to other economic classes in terms of real per capita expenditure, sector of employment, and multidimensional poverty, thereby tracing the major changes that occurred from 1995 to 2011. We also report changes in the economic well-being of more skilled professionals and their allocation across our economic groupings. Finally, we share some reflections on the results, particularly the paradox of rising poverty (hence a declining share of the middle-class population) alongside what appears to be stagnating income inequality and rapid aggregate economic growth.

*Estimating the lower and upper thresholds for middle class measurement and population distribution across expenditure brackets*

Figure 6 shows the distribution of mean expenditure per capita per day (converted into 2005 PPP\$) for percentiles, and density in 2011. The Egyptian inequality index (Gini) is quite low (at approximately 0.3), which is reflected in a relatively flattened distribution curve. The lower and upper poverty lines, as well as the thresholds for the middle class and the affluent class, are drawn at respective points of the distribution. The lower poverty line in 2011 (the official or national poverty line for Egypt) is equivalent to PPP\$2.3 per day, which is almost double the international line of US\$1.25 applied in global poverty measurement. The upper poverty line or the middle class threshold was estimated at PPP\$3 per day. Individuals between PPP\$2.3 and PPP\$3 per day thus lie within the vulnerable class.<sup>16</sup>

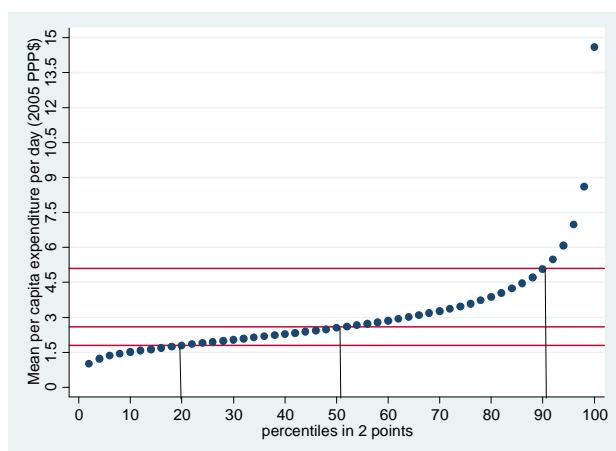
Consistent with our observation in Figure 2, the density of the expenditure distribution shows that both the lower and upper poverty lines are quite close to the modal value. This indicates that any small shift in the mean expenditure distribution would lead to a significant number of people exiting from poverty and vulnerability to the middle class, and vice versa. The expenditure bracket for the middle class ranges between PPP\$3 and PPP\$6.1 (with a corresponding mean expenditure level between the 49th and 93rd percentile) and between PPP\$6.1 and PPP\$6.8 for the affluent class (with a corresponding mean expenditure level between the 93rd and 95th percentile). In 1995, the middle class thresholds ranged between PPP\$2.6 and PPP\$5.1 (corresponding to a mean expenditure level between the 51st and the 91st percentile), and the threshold for the affluent class ranged between PPP\$5.1 and PPP\$6.1 (corresponding to a mean expenditure level between the 91st and the 95th percentile). In general, the shapes of the distribution and density functions are very similar for both years indicating little change in inequality of expenditure.

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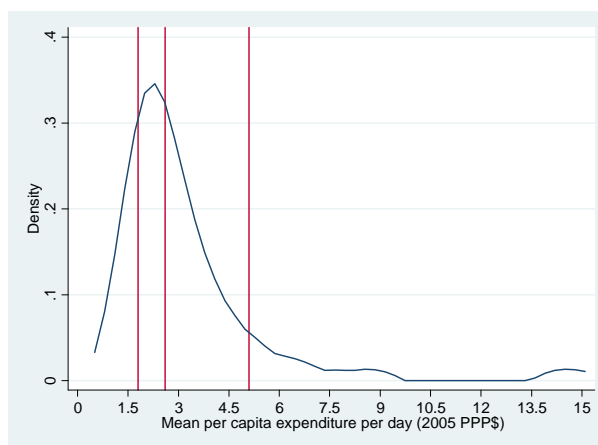
<sup>16</sup> Here it is important to clarify that the nominal values from the survey are converted to 2005 PPP\$ for the sole purpose of presenting our results in a manner that is consistent with earlier reviewed international measures and thus has no effect on the results. In fact, if the PPPs exchange rates provided an accurate approximation of constant purchasing power then the value of the poverty line should have remained constant since it is based on a relatively fixed basket of goods and services, which did not happen.

Figure 6: Mean per capita expenditure (in 2005 PPP\$ per day) and the estimated thresholds for defining the consumer classes in 1995 (A-B) and 2011 (C-D)

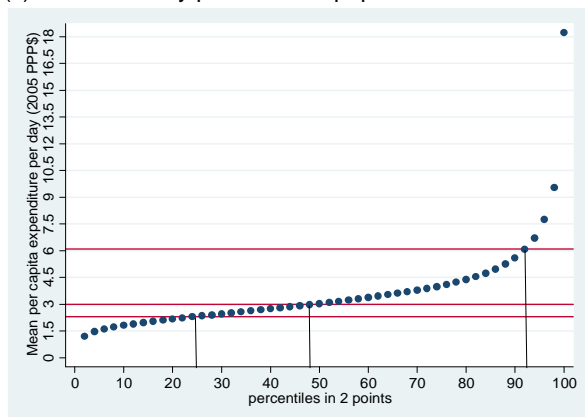
(a) Distribution by percentile of population



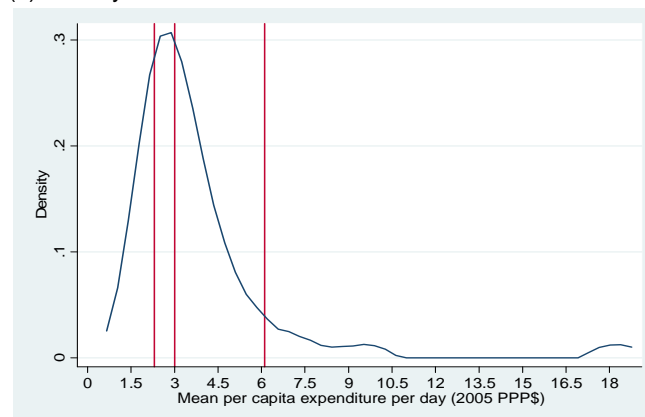
(b) Density



(c) Distribution by percentile of population



(d) Density



Source: Calculations based on Egyptian Household Income, Expenditure, and Consumption Surveys for various years.

### *Size and profile of the middle class in Egypt*

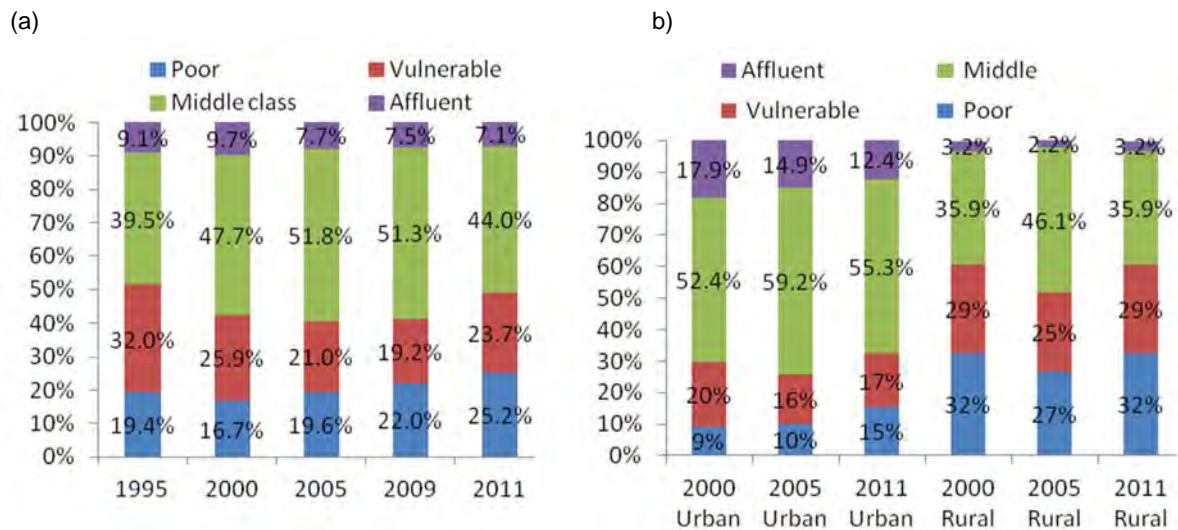
Using those thresholds, we estimated the Egyptian middle-class population to be around 44 per cent of the population in 2011. From 2005 to 2009, it hovered around 51 per cent (Figure 7). Those estimates are modest in comparison to Ali's (2009) analysis (85.2 per cent in 2005) and whose study is, methodologically, the closest to ours among the earlier reviewed ones.<sup>17</sup> One reason for this result is that we use the upper poverty line as a lower threshold whereas he uses the lower poverty line as a lower threshold, thus including our 'vulnerable' class in his definition of the middle class. However, as the latter constituted approximately 20 per cent of the population from 2005 to 2011, even if we were to exclude them from our results, this would still leave our estimate of the middle class at approximately 67 per cent in 2011, almost 30 per cent below his.

<sup>17</sup> Using other reviewed methodologies, such as Ravallion's, Egypt's middle class was 72 per cent of the total population in 1990, which increased to 84 per cent in 2011. Using Birdsall's methodology, Egypt has 0 per cent middle class.



It can be claimed that the period 1995-2005 was the golden era for the Egyptian middle class, which expanded from 39.5 per cent of the population in 1995 to 51.8 per cent in 2005, and remained nearly the same until 2009. The expansion of the middle class coincided with a contraction in the vulnerable category of the population during that period, probably owing to the fact that people above a certain level of expenditure were able to enjoy the benefits of huge state subsidies and might have also benefited from economic growth. However, poverty has been increasing since 2000, which implies that the economic growth was ‘anti-poor’, though it was ‘pro-middle class’. The period 2009-11 witnessed major setbacks for the middle class, while poverty continued to increase, as shown in Figure 7A. In other words, the economic growth turned out to be anti-poor as well as anti-middle class.

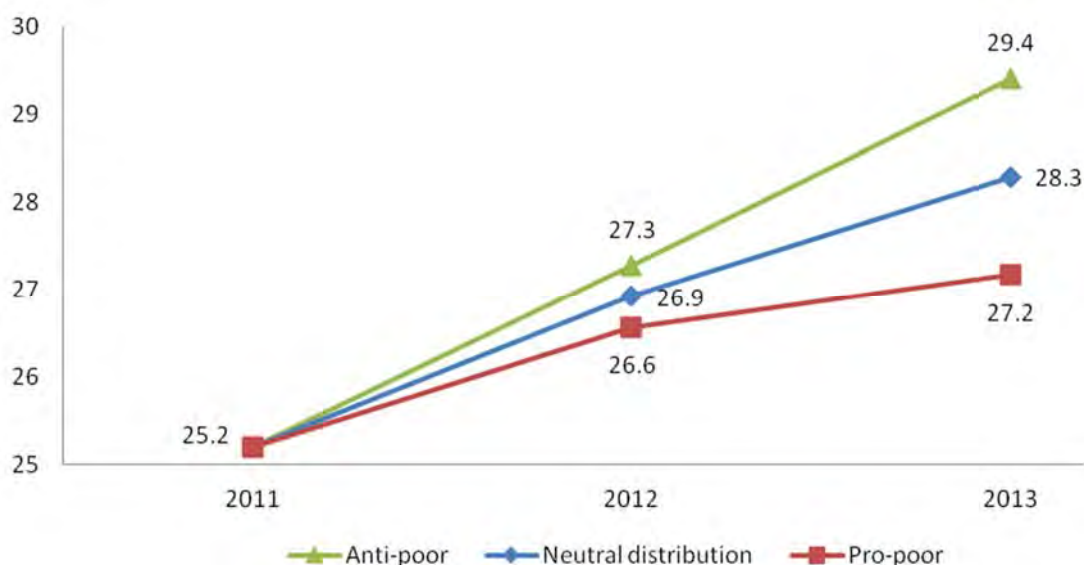
Figure 7: Total distribution of classes in Egypt (a) and rural and urban differences (b) for the period 1995-2011



Source: Calculations based on Egyptian Household Income, Expenditure, and Consumption Surveys for various years.

The disparities between rural and urban areas, however, were far from subtle. As shown in Figure 7B, the urban poor have consistently increased, lending validity to the rapidly increasing phenomenon of the urbanization of poverty. The urban rich have consistently declined; their total population share contracted from 10 per cent to 7 per cent from 2000 to 2011. It would also seem that, in the few years leading up to the 2011 revolution, many more rural vulnerable populations became poor and many more of the rural middle-class population became vulnerable. The categories of the urban poor and the rural middle class therefore warrant further examination by economists and social researchers.

Figure 8: Projected poverty percentage rate for the period 2011-13 for three distribution scenarios



Source: UN and the League of Arab States (2013).

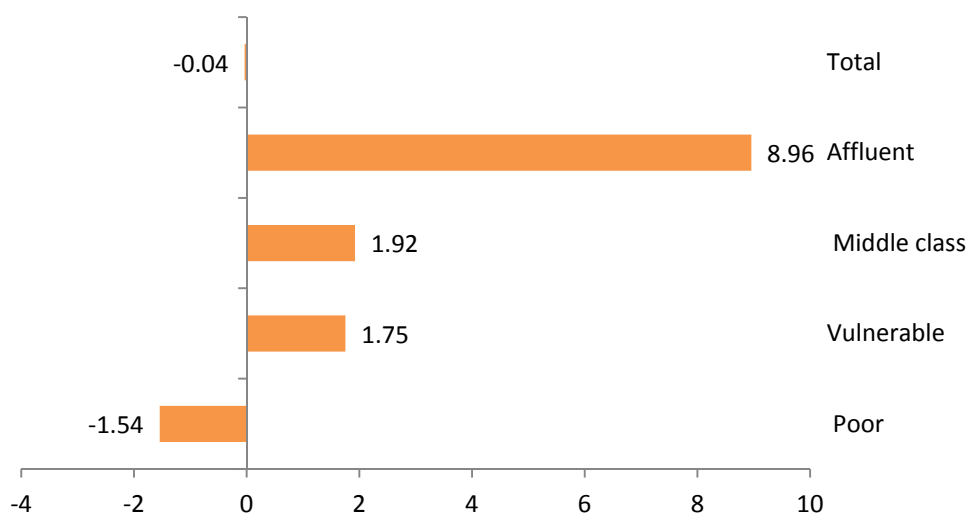
Since 2011, the Egyptian economy has stumbled further as continued political instability spooked investors and hindered economic recovery. Thus, per capita household consumption expenditure is estimated to have further declined by 2 per cent in 2012 and another 2 per cent in 2013. Using three different scenarios, we projected the poverty rates for 2012 and 2013 (Figure 8).<sup>18</sup> In the best-case pro-poor growth scenario, poverty will likely increase by two percentage points, to reach 27.2 per cent in 2013. In the neutral scenario, poverty rates in 2013 will be 3.1 percentage points higher than in 2011, at 28.3 per cent. In the anti-poor scenario, poverty rates will reach 29.4 per cent in 2013. If we assume the same rate of slippage from the middle class to the vulnerable group, the Egyptian middle class may have declined to reach 39 per cent of the population in 2013, almost 12 percentage points less than its size in 2009. In other words, the economic gains of the previous two decades that resulted in a rapidly expanding middle class, at least until 2009, have been lost.

As one would expect from those results, from 2000 to 2011 Egyptian poor households witnessed a decline in average real expenditure per capita by 1.54 per cent as against an 8.96 per cent increase of the same for the affluent groups. The vulnerable and middle-class groups witnessed an increase in expenditure per capita by 1.75 and 1.92 per cent, respectively (Figure 9 a). These results indicate the growing disparity between population classes in Egypt. What is quite surprising is that individuals belonging to our earlier defined professional class witnessed a decline of 19 per cent in average mean real expenditure per capita compared to a negligible decline in that of total population (Figure 9 b). Since most of the professionals are salaried formal sector employees, this finding may be explained, to some extent, by a declining trend of real earnings of workers, especially after 2008. For example, the average median real earnings in Egypt declined by a significant 12.3 per cent between 2008 and 2009 among workers aged between 25 and 60 (see Cichello et al. 2013).

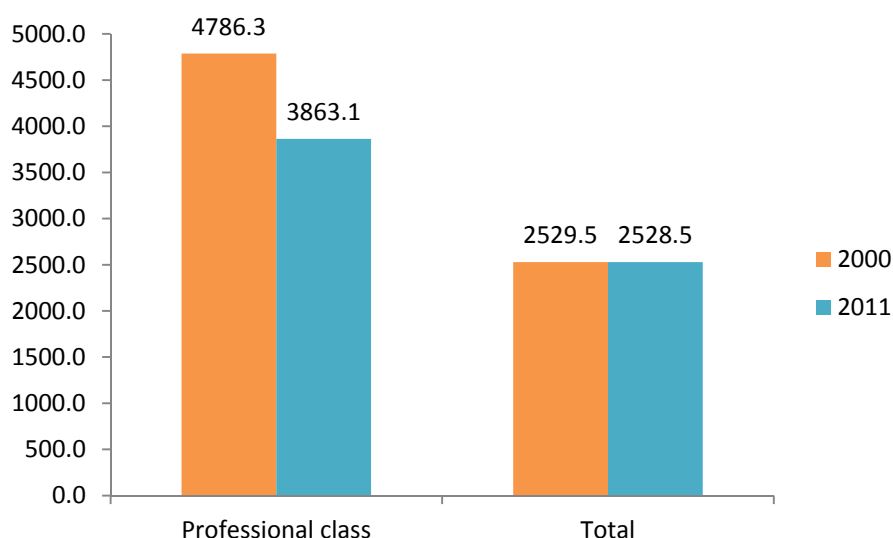
<sup>18</sup> The income distribution of growth since 2011 is uncertain. Thus, following Kakwani and Son (2006), three hypothetical scenarios for growth elasticity have been chosen depending on income distribution,  $k = -0.5$ ,  $k = 0$  and  $k = +0.5$ . A positive (negative) value of  $k$  means that inequality increases (decreases) with growth and this pattern is classified as anti-poor (pro-poor). Growth distribution is neutral if  $k = 0$ . Here the change in inequality is measured by the change in the Egyptian pound index.

Figure 9: Real expenditure per capita for different population classes for the period 2000-11

9 (a)



9 (b)



Note: The real expenditure per capita (in 2005 PPP\$) is based on the deflators derived from the differences in thresholds over time for each class. Assuming no change in the basket of goods over time for each group of consumers, the differences in thresholds over time then implies the price level differentials across surveys, as obtained from the survey responses.

Source: Calculations based on Central Agency for Public Mobilization and Statistics (1995-2011).

Part of this situation in the labour market can be attributed to the impact of the world financial crisis and the economic slowdown over the period 2006-12, as evident from the declining overall employment rate in Egypt, while there was a substantial increase in underemployment over the same period (see Assaad and Krafft 2013). However, rising food prices also played a major role as food inflation has been leading the consumer price index since 2005. Egypt, being a major food importer, is vulnerable to food price shocks. Hence, the rapid rise in poverty during that period can be directly attributed to a marked rise in food prices, especially during the period 2008-10. In 2009, food price inflation was about 60 per cent higher than for the overall consumer price index. In 2011, prices from survey data also show that the poor and vulnerable category report a much higher inflation rate than the consumer price index inflation rate, which must be primarily owing

to high-priced food items that constitute the bulk of their expenditure basket. Middle-class and affluent groups report inflation rates closer to the overall consumer price index.

Table 1: Distribution of economic classes and professional classes by sector for the period 2000-11 (%)

	Poor		Middle		Affluent		Total population	
	2000	2011	2000	2011	2000	2011	2000	2011
Agriculture	57	43	35	26	15	13	39	32
Industry	8	10	12	14	12	12	11	12
Construction	8	15	6	8	6	5	7	10
Electricity	0	1	1	2	1	3	1	1
Hotels	11	5	13	7	17	5	12	6
Transport	4	2	6	3	6	2	5	2
Finance	1	0	2	0	8	0	2	0
Other services	12	23	26	42	35	60	22	36
Total	100	100	100	100	100	100	100	100

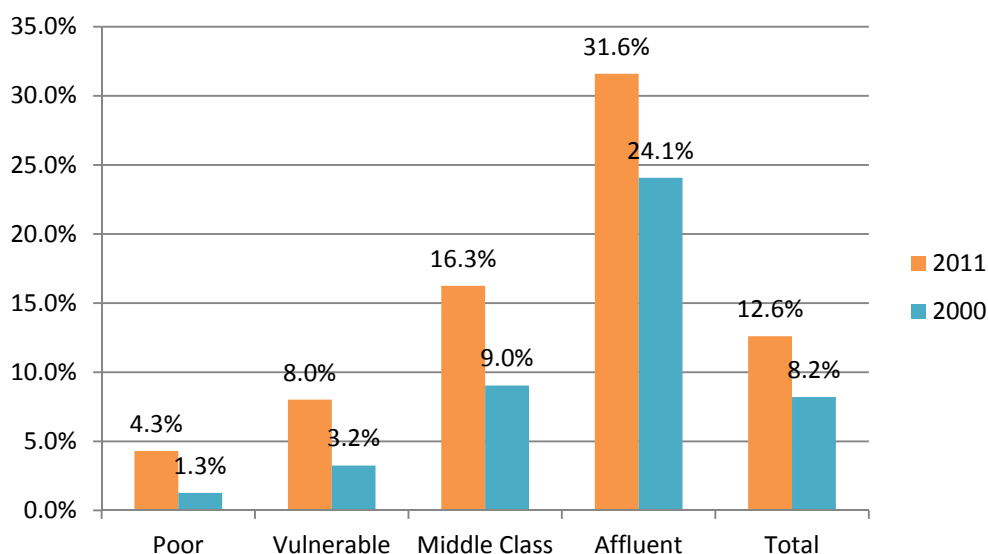
Source: Calculations based on Egyptian Household Income, Expenditure, and Consumption Surveys for various years.

In terms of the employment sector, the findings are not spectacular. The middle class, as is the case with other classes, are increasingly taking jobs in the service sector though it is noteworthy that they have retained and even slightly increased their share of employment in the industrial sector and away from the traditional agricultural sector (along with the poor). Table 2 also reveals that Egyptian workers, including the middle class, are increasingly taking jobs in the other service sector categories. This is a particularly worrisome trend since this service category includes many low value-added activities that are typically associated with the informal sector.

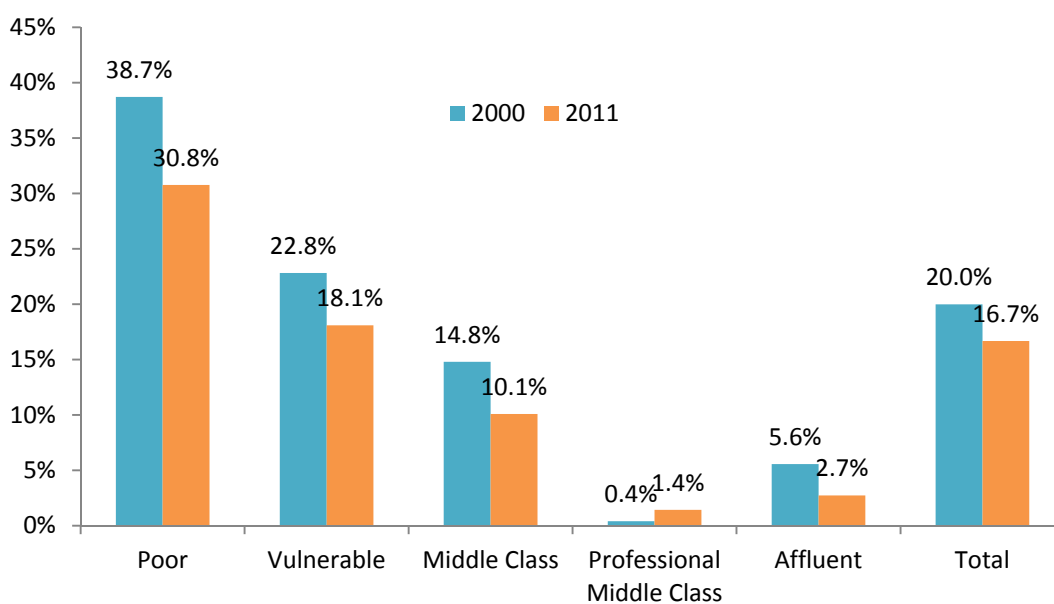
Finally, Figure 10 (a) shows the distribution of professionals across consumer classes from 2000 to 2011, while Figure 10 (b) plots the incidence of multidimensional poverty (taking into account the education and living standard dimensions, see methodology in the Appendix) for both categories over the same period. The main story that emerges from those figures is that the recent development experience in Egypt appears to have led to the creation of a middle class with higher capabilities; a conclusion that can be applied generally to the entire population. This is also evident in an increasing population share of the professional class, a rapidly declining value of the Multidimensional Poverty Index across all groups and even more broadly in the remarkable progress on the Millennium Development Goals in Egypt (UN and the League of Arab States 2013).

Figure 10: Share of the professional class in economic classes (A) and Multidimensional Poverty Index for professional and consumer classes (B) for the period 2000-11

10 (a)



10 (b)



Note: The professional middle class is defined here as individuals aged over 15 who hold a university or secondary degree and are engaged in a professional or white-collar occupation (teaching, administrative, technical, etc.) and are either employed in the formal sector or by an employer.

Source: Calculations based on Egyptian Household Income, Expenditure and Consumption Surveys for various years.

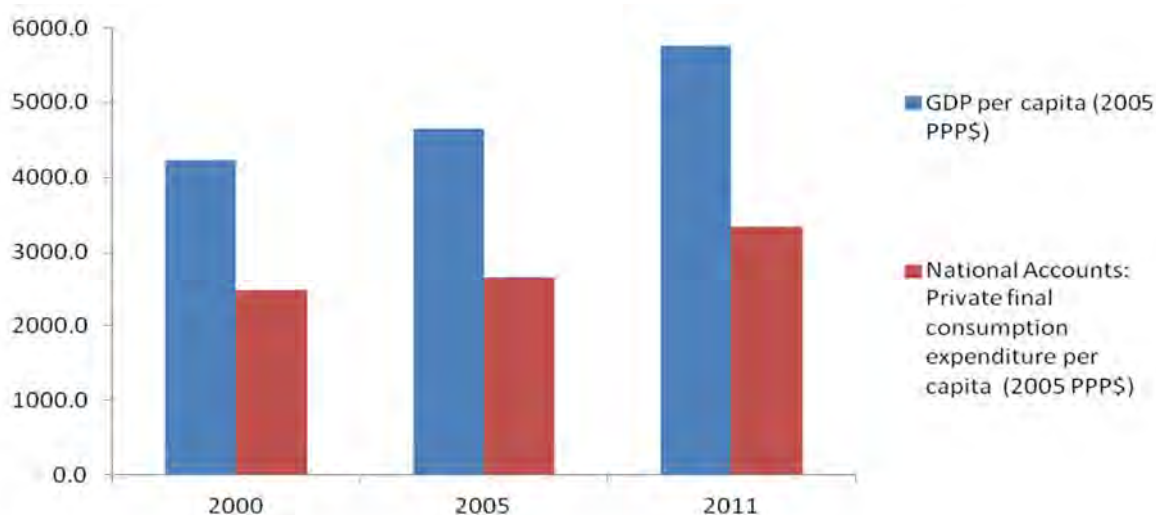
### *Reflection on the paradox of fast growth and rising poverty*

Poverty reduction responds to both economic growth (changes in real per capita consumption expenditure) and changes in inequality in the distribution of consumption expenditure. If a country experiences both economic growth and a decline in inequality, it can be assured of reduced poverty.

Otherwise, it will all depend on the relative strength of each of those two components. As the change in the share of the poor implies a corresponding change in the share of one or more other consumer classes, those growth and distribution dynamics are crucial to our understanding of the dynamics underlying the evolution of the middle class.

In this regard, the stylized facts on poverty, inequality, and household expenditure that emerge from our previous results are somewhat perplexing when compared to the official growth narrative. The Gini index gives a notion of low and stagnating inequality in Egypt over the past two decades, which is not only difficult to tally with the various manifestations of conspicuous consumption, but also with Egyptian national accounts that indicate a handsome gross domestic product (GDP) growth led by sustained increases in private consumption per capita (Figure 11) (see UNDP 2011a). Since the household sector comprises the vast majority of that private consumption, and since the estimates from household surveys and national accounts are supposed to at least yield a similar order of magnitude, this implies either that something is wrong with that narrative or something else is happening.

Figure 11: GDP per capita and household final expenditure per capita in Egypt for the period 2000-11



Source: Based on World Bank (2013b).

Regarding the first scenario, while the Egyptian official GDP growth estimates are far from perfect, they are more reliable than those of many other developing countries. Evidence from various sources suggests that the Egyptian economy grew relatively fast from 2000 to 2011. This therefore leaves us with another possible but rather radical view: that the households that lie at the very top of the actual distribution of expenditure and that tend to be excluded from household surveys had witnessed a phenomenal increase in their income and expenditure while almost all other Egyptians witnessed the opposite (for further discussion see Abu-Ismaïl et al. 2012; Hlasny and Verme 2013). It is supported by the evidence that inequality, measured by the ratio of average expenditure between the ‘rich’ and rest of the population groups, has been increasing during recent decades, where the average expenditure of the ‘rich’ is estimated by combining the information from household survey and private final consumption expenditure in national accounts (see Sarangi et al. 2014). During 2000 and 2011, the inequality ratio in average expenditure increased from 13.7 to 16.2 between the rich and poor; from 9.2 to 11.3 between the rich and vulnerable; from 5.7 to 7.4 between the rich and middle class. In other words, that the growth process was concentrated in very few sectors and benefited very few households, whose expenditure lay beyond the grasp of official surveys.

### 3 Concluding remarks

Households tend to spend their income on a variety of goods and services after meeting food needs. Engel's Law states that the demand for food increases less than proportionately with income, implying that non-food expenditure choices, especially non-essential ones, are mainly the prerogative of better-off households (Kakwani and Son 2005). Therefore, the degree of choice that households have over their budget is a critical factor in deciding their economic class in any society.

The philosophical foundations for this position are already well articulated in the now vast literature on the capability approach to human development. The poor seldom have much choice in their consumption basket other than what is essential food and non-food expenditure. As people earn above what they need to satisfy their basic needs, the degree of freedom they have to consume items that are deemed less essential (for example, air conditioners, washing machines, telephones and designer clothing) grows until it occupies the majority of consumption expenditure. At that stage the person becomes a conspicuous consumer or, in our view, a member of the affluent class.

Current economic definitions of the middle class have a different starting point. They rely mainly on the purchasing power exchange rates to level the playing field between consumers. However, for many reasons, they do not perform this function and thus yield biased results. Our proposed methodology overcomes this bias by resorting to household data at the national level. In short, and as is the case with poverty assessment methodologies that rely on household-specific nationally defined poverty lines to derive the cost of basic needs, we do away with PPP exchange rates altogether and resort to micro level household survey data to produce a more reliable estimate of the size of the middle class based on the level and composition of their consumption expenditure.

We are of course well aware that our approach does not readily lend itself to international comparisons. This is an issue which merits further examination and needs to be addressed but this is beyond the scope of the present paper. Nonetheless, it is worthwhile noting that the problem can be easily overcome if those thresholds are estimated for a sufficiently large number of countries to allow cross-country comparison with per capita expenditure (see Abu-Ismael 2012 on rethinking global poverty measurement).

Applying our method to Egyptian household surveys from 1995 to 2011 shows a growth process that was pro-poor and pro-middle class from 1995 to 2000 and anti-poor and anti-middle class from 2005 to 2011. Throughout the entire period, however, there were major improvements in the human capital and capabilities of the Egyptian middle class and society in general. It is of course reasonable to expect the rising capabilities of a by and large youthful middle-class population to produce a commensurate rise in their level of expectation of decent employment and economic well-being. Accompanying those aspirations, however, was an overall dismal economic record that negatively affected the welfare of the poor and widened inequality across population classes. In this context, the rise in poverty and the erosion of the middle class are but expected consequences. Our findings also show that the professionals, who are typically identified by sociologists as the bedrock of the Egyptian middle class, appear to have incurred far more economic losses than average. Not surprisingly, they arguably spearheaded the 2011 Egyptian revolution.

Nonetheless, there is an uncomfortable set of stylized facts in those results in the form of a large and increasing discrepancy (at least compared to other developing countries) between GDP growth and real expenditure reported in household surveys. While the scope of the present paper does not allow a deeper analysis of the sources of growth and its transmission channels to beneficiaries to corroborate any of those hypotheses, and in any case that would be a very difficult

task to accomplish, we merely infer from such a paradoxical trend that it lends further support to our main finding that the growth processes were generally exclusionary in Egypt during the decade that led up to the 2011 revolution.

Finally, it goes without saying that the nature of the growth process has a direct impact on the size of the middle class. If economic growth is more pro-poor and inclusive, then more people at the lower end of income distribution will tend to graduate to the middle class category than if economic growth is skewed in favour of the rich. It is also straightforward that the diverse saving and consumption patterns of the various economic segments of society indicate a strong causal link between redistributive macroeconomic policies and the level of economic growth. This is intuitively clear as consumption choices at the bottom end (below the upper poverty line) tend to be more inelastic and concentrated in locally produced low value-added goods, as a major share of expenditure goes to meeting basic needs. The consumption choices of the upper class, however, are more extensive as they have a wider spectrum of options to adjust to adverse shocks. Their consumption basket also tends to be more concentrated in often imported higher value added goods. Under these circumstances, as illustrated by Taylor (2004), a redistribution of income from the rich to the poor may cause lower aggregate demand leakages and thus a higher growth multiplier. This causal link between macroeconomic distribution policies and growth is also an issue that warrants further theoretical and empirical examination.



## Appendix

### 1 Poverty lines

Poverty lines are constructed on the basis of the commonly used Basic Needs Approach (Ravallion 1998). Following this approach, the poverty line is set as the cost of a normative ‘basic needs’ bundle of goods, which is adjusted for price variations across regions and over time. The difficulty is in identifying what constitutes basic needs. For developing countries, the most important component of a basic needs poverty line is generally the food expenditure necessary to attain some recommended food energy intake. Thus, the food bundle is typically chosen to be sufficient to reach the predetermined calorie requirement, with a composition that is consistent with the consumption behaviour of the poor. This bundle is then evaluated using prices prevailing in each sub-group (region) and at each date. The cost of a bundle is known as the food poverty line.

The next step is to augment the food poverty line by an allowance for non-food expenditure, which constitutes essential goods. Applying Engel’s Law, the non-food allowance can be estimated by regressing the food share against total expenditures in two ways: identifying the non-food share in the expenditure distribution of households in which expenditure on food is equivalent to the food poverty line; or identifying the share of non-food expenditure for households in which total expenditure is equivalent to the food poverty line. The former approach yields an upper bound of the poverty line, while the latter yields a lower bound or the ‘ultra’ poverty line, since it defines the total poverty line in terms of those households that had to displace food consumption to allow for non-food expenditures considered to be the minimum indispensable level of non-food requirements.

While the cost of the minimum food bundle is derived from estimated physiological needs, there is no equivalent methodology for determining the minimum non-food bundle. According to Ravallion (1998), a minimum allowance for non-food basic needs is  $z^f - f(z^f)$ , which gives a poverty line  $z = 2z^f - f(z^f)$ . The  $z^f$  is the food poverty line and  $f(z^f)$  is the expected value of food spending where total spending equals the food poverty line. To estimate the non-food allowances, food shares are regressed against the logarithm of total household expenditure relative to the food poverty line and its square, the logarithm of household size and its square, the share of small and older children, the share of adult males and females, and the share of elderly persons.

$$s_i = \alpha + \beta \log(x_i / z^f) + \gamma (\log(x_i / z^f))^2 + \delta b_i \quad (1)$$

Where  $s_i$  denotes food share of household  $i$ ,  $x_i$  is its total consumption,  $z^f$  is the food poverty line, and  $b_i$  is the vector of household demographic characteristics. The  $\alpha$  is the average food share of those households that can just afford basic food needs.

$$\text{Therefore, the lower poverty line is } z = (2-\alpha) * z^f \quad (2)$$

The upper poverty line,  $z^*$ , is obtained by solving equation (1) iteratively. It can be written as  $z^* = z^f + z^n$ , where the expenditure on food in the total expenditure of households is equivalent to the food poverty line  $z^f$ , and  $z^n$  is the corresponding non-food expenditure.

## 2 Poverty rates

The incidence of poverty,  $P_0$ , is defined as the fraction of the population below the poverty line. If the cost of meeting basic needs is  $x$ , then the incidence of poverty according to the lower poverty line is:

$$P_0 = \frac{1}{N} \sum_{i=1}^N 1(x_i \leq z)$$

where  $1(\cdot)$  is an indicator function that is 1 if its argument is true and 0 otherwise (Deaton 1997).

The upper poverty rate is:

$$P'_0 = \frac{1}{N} \sum_{i=1}^N 1(x_i \leq z^*)$$

## 3 Middle class

### 3.1 Non-food consumption function

The definition of middle class, as discussed in the paper, uses household consumption expenditure patterns to identify the thresholds. Household expenditure patterns indicate that food share is a declining function of a household budget and that non-food consumption share, especially the non-essential items, is an increasing function of a household budget. The large-budget households tend to spend relatively more, in per capita terms, on non-essential items than other households. The expenditure per capita on non-essential items, therefore, can be written as an exponential equation, such as:

$$x_n = e^{\beta_0} y^{\beta_1} e^u \dots (1)$$

where  $x_n$  is non-food non-essential expenditure per capita and  $y$  is total per capita expenditure. Transforming equation (1) into logarithms gives the below equation.

$$\ln(x_n) = \beta_0 + \beta_1 \ln(y) + u \dots (2)$$

Taking the derivatives in equation (2) will give the coefficient  $\beta_1$  as the elasticity of per capita non-food (non-essential) expenditure ( $x_n$ ) with respect to total per capita expenditure ( $y$ ). If  $\beta_1 = 1$ , it implies that a 1 per cent increase in average per capita consumption expenditure leads to, on average, a 1 per cent increase in non-food non-essential consumption. If, with respect to total expenditure  $\beta_1 > 1$ , it implies that a 1 per cent increase in total expenditure per capita increases average per capita consumption of non-food items, including comforts and luxuries, by more than 1 per cent. The illustration (Figure 5) shows that the expenditure elasticity of consumption of non-food non-essentials is elastic ( $\beta_1 > 1$ ).

### 3.2 Setting middle class thresholds

The middle class comprises people whose expenditure per capita lies between the thresholds of upper poverty line ( $z^*$ ) and the expenditure per capita level ( $m$ ) at which a household's non-food

non-essential consumption per capita is equivalent to the value of the lower poverty line ( $z$ ). This group are those who not only meet the basic necessities at the expenditure per capita level of ( $z$ ), but also have an equivalent level of expenditure per capita on non-essential non-food expenditure.

People who are at equal to or above the ( $m$ ) level of expenditure per capita are the more affluent class. They enjoy broader choices in the consumption of luxury items.

### 3.3 Professional middle class

The professional middle class are identified as the group of formal sector professionals, aged 15 and above, who have attained a minimum of secondary education and are employed in white-collar occupations, such as administrators, government officials, and senior technicians, as well as permanent non-manual employees, supervisors, and the lower strata of technicians.

## 4 Multidimensional Poverty Index

The Multidimensional Poverty Index for Egypt is calculated using the same methodology that global human development report uses (Alkire et al. 2011). However, lack of available data on health indicators in Egyptian surveys calls for dropping this dimension from the index calculation. Therefore, we used two dimensions, education and living standards – each with equal weights of (1/2).

The dimensions, indicators, thresholds, and weights are as follows:

The education dimension has two indicators: having no household member who has completed five years of schooling; and having at least one school-age child (up to grade 8) who is not attending school. Each indicator is assigned a weight of (1/4).

The standard of living dimension has six indicators: not having electricity; not having access to clean drinking water; not having access to adequate sanitation; using ‘dirty’ cooking fuel (dung, wood, or charcoal); having a home with a dirt floor; and owning no car, truck, or similar motorized vehicle while owning at most one of the following assets: bicycle, motorcycle, radio, refrigerator, telephone, or television. Each indicator is assigned a weight of (1/12).

Each person is assigned a deprivation score according to his or her deprivations in the component indicators. The deprivation score of each person is calculated by taking a weighted sum of the deprivations experienced, so that the deprivation score for each person lies between 0 and 1. The score increases as the number of deprivations of the person increases and reaches its maximum of 1 when the person is deprived in all eight indicators. A person, who is not deprived in any indicator, receives a score equal to 0.

$$c_i = w_1 I_1 + w_2 I_2 + \dots + w_d I_d$$

where  $I_i = 1$  if the household is deprived in indicator  $i$  and  $I_i = 0$  otherwise, and where  $w_i$  is the weight attached to indicator  $i$  with

$$\sum_{i=1}^d w_i = 1$$

To identify the multidimensionally poor, the deprivation scores for each household are summed to obtain the household deprivation score,  $c$ . A cut-off of 33.3 per cent, which is the equivalent of one-third of the weighted indicators, is used to distinguish between the poor and non-poor. If  $c$  is 33.3 per cent or greater, that household (and everyone in it) is multidimensionally poor.

The headcount ratio,  $H$ , is the proportion of the population who are multidimensionally poor.  $H = q / n$ , where  $q$  is the number of people who are multidimensionally poor and  $n$  is the total population.

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