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MIDDLE-CLASS COMPOSITION AND GROWTH IN MIDDLE-INCOME COUNTRIES

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Abstract

The impact of the expansion of the middle class in developing countries has been widely investigated in recent years. The middle class is generally apprehended by its overall demographic size, which, we believe, may hide crucial features and differences across nations because the composition of the middle class is not considered. We investigate the composition of the middle class by computing various statistical features of the distribution of income and of consumption: the incidence, the depth (the average consumption), and the heterogeneity of the middle class for a panel of 120 countries from 1985 to 2012. Furthermore, four subcategories of middle class are considered. The empirical investigation has been run on a reduced dataset of 52 middle-income countries using a two-step system GMM estimator. The bulk of bottom middle classes is found to be negatively linked to growth, whereas the composition of the middle class in those countries reveals a still large share of floating and lower middle classes. Our results also confirm that the size of a unique middle class alone is not enough to comprehend the complex mechanisms through which the expansion of the middle class impacts on growth. For middle-income countries, the consumption capacity of the middle class is what matters most and a middle class that is large and wealthier is more likely to have greater impacts.

Keywords: middle-class, income distribution, economic growth, middle-income countries

JEL Classification: 011, 015, 047

Contents

INTRODUCTION

By focusing on two social groups, namely the high- and low- income groups, political economy has long tended to neglect the socioeconomic role that such intermediate groups as middle-classes can play in economic development. The huge expansion of this income group over the last decade has brought into light new issues and challenges attached to this distributional change. Ravallion (2010) estimates that the middle-class grew from 1.4 billion to 2.6 billion individuals between 1990 and 2005, representing 48.5% of the world population in 2005 against 32.7% in 1990. Obviously, the economic weight of this group has increased accordingly, with many emerging economies and international development banks attaching great importance to it.

Although the rise of the middle-class in developing countries has been described and commented on by a number of recent studies (Banerjee and Duflo 2008; Birdsall 2000; Chun 2010; Kharas 2010; Ravallion 2010), empirical analyses of the macroeconomic impact of this change in income distribution remain scant. Whilst various analyses have been conducted by private or public institutions or regional development banks, they generally are mainly descriptive and lack sound econometric analysis (see for instance AFDB 2011; Brandi and Büge 2014). One reason for this gap in the literature may be found in the lack of reliable, complete, and comparable panel data on the distribution of income, which has limited research to one single dimension of the middle-class—its size in terms of population and/or consumption (Kaufmann et al. 2013).

Yet, limiting the analysis to one dimension of the middle class may, namely, its demographic size, miss the point since other dimensions of the distribution of income within the middle class reflecting the internal heterogeneity and asymmetry of this income group may well explain gross domestic product (GDP) growth or differences across time and space. Although an increase in the size of the middle-class has often been related to overall inequality in the recent literature[1], the size of the middle-class has never been connected to the inequality within this income group. Strong inequality potentially prevails within the middle-class group, especially when the income range used to identify it is broad, like, for instance, the US$0 to US$100 range used by Kharas (2010) and Kaufmann et al. (2013). Income inequality within the middle class may dampen or magnify the impact of the size.

In addition, the size indicators adopted by the various studies do not necessarily converge, the middle-class being itself a complex concept, hugely context-dependent, which cannot be easily measured. Basically, a country's middle-class is composed of people who are neither poor nor rich. Numerous empirical studies therefore measure the middle-class in terms of income, either through an absolute, relative, or mixed approach (Banerjee and Duflo 2008; Kharas 2010; Ravallion 2010; Easterly 2001; Birdsall 2010, 2014). Various other studies have attempted to identify more specific and detailed decompositions of the middle-class income group on the basis of socioeconomic criteria fitted to the context of the study (Bonnefond et al. 2015; Nallet 2014; Handley 2015). Yet, since these analyses generally use national household

[1] Easterly (2001) uses the size of middle-class as a proxy for income equality as well as other concentration or disparity measures. In the same vein, Van de Walle (2011) shows that the correlation between the middle-class size and global inequality is negative: a society in which middle-class is large enough is more likely to be less unequal. Conversely, Birdsall (2010) argues that the increase of the share of national income held by the middle-class is not always associated with a decline of income inequality at the country level. In the People's Republic of China, Brazil, or India, the growth of their middle-classes' economic power has even been associated with a considerable increase of overall inequality.

surveys' micro-economic data they cannot investigate the impact of different attributes of the middle class on such macroeconomic features as economic growth.

Despite its limitation, notably in terms of the choice of thresholds and of the number of middle-class subgroups, this paper is the first attempt, to the best of our knowledge, to fill the gap in the literature highlighted above. Using an unbalanced panel dataset of 120 middle-income countries from 1985 to 2012, we first describe various statistical features of the middle-class income group (size, economic weight, heterogeneity, and configuration) by using grouped data drawn from the World Bank Povcal database. Then, we analyze econometrically the impact of these various statistical features on GDP growth for the panel of countries investigated. What we are interested in is to determine if what matters for growth is the single size of the middle-class, or if other aspects of the middle-class income distribution need also to be considered and accounted for.

Addressing the growth impacts of rising middle-classes in developing countries in the way we do in the present paper is unprecedented in the literature. Nevertheless, our underlying hypothesis—that when the middle-class becomes numerically large enough with respect to total population, its household members tend to adopt behavior whose aggregation might have aggregate impact on economic dynamics—relies largely on previous work. In a nutshell, the main characteristic of these middle-classes indeed lies in their capacity to prompt macroeconomic changes through the aggregation of micro-economic changes with regard to consumption, labor supply, or investment. Such mechanisms have been frequently mentioned in the literature (Clément and Rougier 2014; Handley 2015) without being systematically empirically investigated. The issue is complex since the implication of the emergence of the middle-class on macroeconomic dynamics can be analyzed from several angles, like growth or structural change, and by looking at several channels of transmission, like investment in human capital, entrepreneurship, or political participation. Moreover, the relation is not necessarily unidirectional: the growth dynamics prompted by middle-classes may also favor the promotion of this middle-class behavior, for example when increased productivity or industrialization raises the skill premium and educational returns. There are good reasons to think that, at some stage, a virtuous circle may appear by which middle-class expansion may spur economic transformation, while being, in turn, triggered by this economic and political change. In the present paper, we are primarily interested in the first linkage—the impact of middle-class expansion on economic growth.

Various authors have emphasized that the size of the middle-class might have a strong positive impact on economic growth through different channels like mass consumption, productivity increase arising from scale effects (Murphy et al. 1989; Easterly 2001), or learning spillovers (Desdoigt and Jaramillo 2014). Also considering that the large middle-class of England in the early 19th century is a key explanatory determinant of this country's early industrialization, Landes (1998) depicts how a society endowed with a wide middle-class becomes increasingly capable of reaching global prosperity. For Adelman and Moris (1967), the middle-class has been the engine of economic development in industrialized countries and will be the key driver of growth in low-income countries. Birdsall (2010) goes further by arguing that the increasing size and economic command of the middle-class may well be the signal that the underlying growth regime is based on genuine productivity gains and wealth creation by a modern private sector. This relationship between middle class and economic growth is not necessarily unidirectional, though. Ravallion (2010) has provided convincing evidence that the faster the economic growth, the faster the expansion of the middle-class and that growth tends to be more pro-poor in the developing countries exhibiting a larger

initial middle-class. Birdsall (2010) goes a step further by contending that the emergence of a middle-class—partially driven by more people escaping from poverty—may be an outcome of growth rather than one of its determinants.

The paper is organized as follows. Section 1 describes our data and methodology for identifying the middle-class. Section 2 presents our preliminary descriptive analyses. Section 3 presents our econometric models and section 4 presents our results.

1. DATA AND METHODOLOGICAL CHOICES

Since we aim to analyze specific patterns concerning the middle-classes in lower- and middle-income countries, we need to first of all identify them. We have used grouped data collected from Povcal (PPP 2005) that provide headcounts (corresponding to our five thresholds), consumption/income distribution by deciles, as well as monthly consumption/income per capita and the overall population Gini index for each survey year. For the years located between two surveys, we calculate the mean of years before and after for each aggregate. In addition, we have excluded the countries with populations of less than 1 million, because they may have specific productive structures and dynamics that potentially generate biases[2]. We have also excluded the countries with less than one survey available. The number of surveys differs between countries, so that we end up with an unbalanced panel of 120 middle-income countries, with the maximum years available for each of them from 1985 to 2012.[3] For the empirical investigation, we limit the dataset to a sample of 52 middle-income countries.

To classify countries according to their development level, some authors use an arbitrary threshold based on countries' convergence achievement or on quantiles (middle countries are usually those left when the poorest and the richest have been identified): Eichengreen (2011, 2013) sets a superior threshold at US$10,000; Ozturk (2016), for example, considers as middle-income countries those with 20% to 55% of United States (US) GDP per capita. Among the existing country classifications, those of the United Nations Development Programme (UNDP) (providing their Human Development Index [HDI] levels) and the World Bank are the most used. The latter provides a threshold that can be applied to a long-run dataset of gross national income (GNI). Since such data are not available before the 1990s for the majority of countries, researchers (Felipe 2012; Van der Hout 2014) have calculated GDP per capita corresponding thresholds.[4] We will use Van der Hout (2014)'s classification based on Penn World Table GDP in constant 2005 purchasing power parity (PPP) dollars. So, a country is classified as low-income if its GDP per capita is less than $2,250, as lower middle-income if it is between $2,250 and $7,500, as upper middle-income if it is between $7,500 and $14,500, and as high-income if it is $14,500 or higher. Countries' classification is determined based on their income level in 2012.

Constructing a comparable and comprehensive long-run dataset on global middle-class including as many countries as possible imposes to choose sufficiently large intervals. In the case of USA, for example, Birdsall (2010) has found a high level of middle-class inequality making her assume that there may be at least two sub-categories of middle-class in the country. In the same vein, Ravallion (2010) could identify two subcategories of middle class households in developing, one ranging from 2 to 9 US$

[2] Those countries are for the most those with less than seven observations.

[3] See Table 9 for the list of countries.

[4] Of course, there is no perfect match with the World Bank's classification; resulting in some differences in the repartition of countries.

and another from US$9 to US$13. Rather than a unique middle class whose identification by using income thresholds is debatable, the mixed approach used by Ravallion (2010) seems more relevant to our purpose. Accordingly, we will consider in the present paper four sub-categories of middle-class, composed of the three bottom categories identified by AFDB (2011) to which we add a higher interval.

As we want to identify each middle-class potential configuration according to three dimensions (incidence, depth, and heterogeneity), we need to set a threshold for each dimension measure. For now, we will set the threshold for each indicator at its median value for the sample. To begin with, we calculate each indicator distinguishing between 1) developed and developing countries; and 2) income classification. In this section, middle-class is composed of those with consumption per day between US$2 and US$100.

2. PRELIMINARY EVIDENCE

To highlight the potential differences amongst countries' income levels in terms of middle-class composition, we first use an extended panel dataset composed of 120 countries including all income levels[5] from 1985 to 2012.

2.1 Middle-class Incidence: Size and Economic Weight

Middle-class size refers to the share of the population that belongs to the middle-class and its economic weight is the middle-class total consumption share. For the developing world, the mean and median sizes are 72.52% and 81%, respectively, while those for developed countries are both 98%. In terms of economic weight, developed countries' mean and median are 95.7% and 97.9%, respectively, while those for developing ones are 86.44% and 95.44%, respectively.

Table 1: Minimum, Mean and Median Size and Economic Weight by Income Category

	Low Income		Lower Middle		Upper Middle		High Income		Sample	
	Size	Weight	Size	Weight	Size	Weight	Size	Weight	Size	Weight
Mean	42.30	62.83	59.24	79.56	84.14	94.74	96.85	96.73	77.67	88.36
Median	37.93	63.65	63.15	87.66	87.26	96.54	98	98.53	87.73	95.97
Min	1.02	3.24	8.91	21.93	15.04	32.40	71.76	66.56	1.02	3.24

Source: Author's calculation.

Secondly, Table 1 displays the indicators for each income category and shows that the size and weight of the middle-class increases with development level. Following Birdsall's (2010) methodology, the size and economic weight of the middle class will be included separately, as they are two different but complementary indicators of inclusive growth.

[5] This dataset includes countries from Eastern Europe and Central Asian countries (17), Latin America and Caribbean (19), Middle East and North (9), South Asia (5), East Asia (9), Sub-Saharan Africa (33), Western Europe and North America (28). See table 10 in Appendix for the detailed list of countries.

2.2 Four Subcategories of Middle-class

Beyond the distinction between developing and developed countries, which is standard in the literature (AFDB 2011; Ravalion 2010; Gertz and Kharas 2010), we will need to identify different middle-class subgroups and their relative size. Indeed, since middle-class corresponds to people that are not poor but are not rich, it corresponds to a wide range of income. Instead of fixing a wide and unique interval that does not reflect all features of middle-class or consensual either, we distinguish four subgroups of middle-class whose thresholds are based on previous work:[6] 1) the floating class in the interval (US$2; US$4) comprises no longer poor but still vulnerable households (Birdsall 2010; Clément and Rougier 2014); 2) the lower middle-class corresponds to households earning between US$4 and US$10; 3) the upper middle-class (US$10; US$20), and 4) the higher middle-class]US$20; US$100). In addition, we have calculated the ratio $\frac{upper+high}{float+lower}$ (in terms of population share) as a proxy of how rich a country's middle-class is: the higher this ratio, the better for a country. Indeed, an increase in this ratio can be associated with an upward mobility from bottom to top middle-class of a number of households. It means an improvement of their well-being, and a change in their consumption habits and their behavior, that will in turn have positive outcomes in terms of growth through different channels.

Although the four aforementioned categories can be identified for most countries, throughout the whole period some low-income countries only have the three lowest categories[7] and some high-income countries[8] only have the three upper ones. Depending on the countries' income level, each sub-class's share of total population may be different. As we can see in Figure 1, the middle-class is mostly located in the lowest range of income in poorer countries and progressively moves to the highest range of income when income per capita increases.

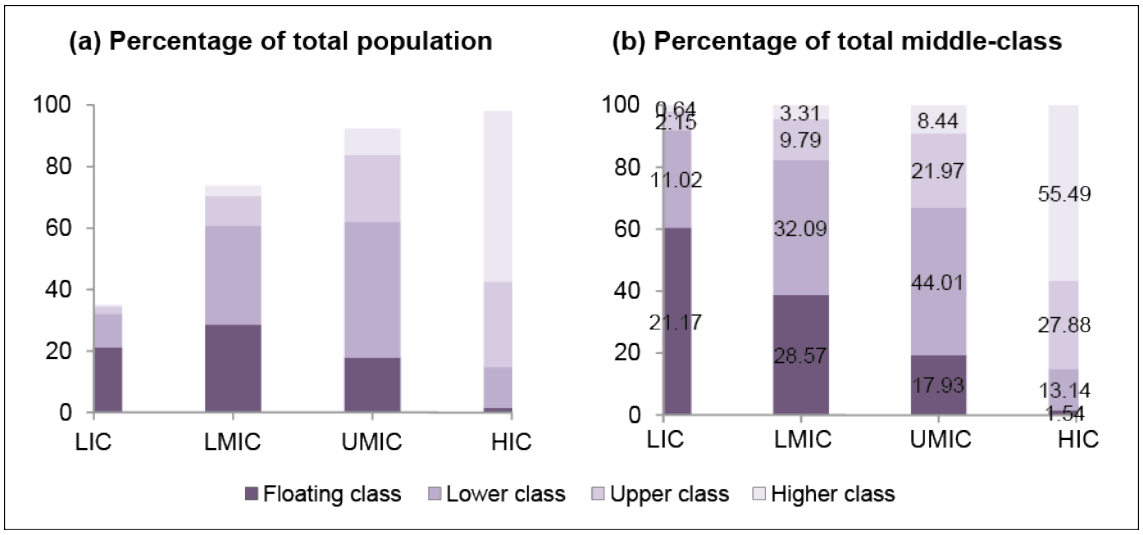
When we look at each subgroup's economic weight in panel (b) of Figure 1, the pattern is similar, with an interesting variation for low-income countries in which, on average, 42% of total population account for 62% of total consumption; and each one of the three top subgroups' share in total consumption is worth two times its share in population. Figure 1 also illustrates the dynamics of middle-class expansion. Indeed, as a country develops, more and more people escape from poverty to the floating class, and then move from the floating class to the lower middle-class, and so on.

[6] Millanovic and Yitzhaki (2002) and Bussolo et al. (2008) consider all the households with per capita income situated between the average per capita incomes of Brazil and Mexico or between 10 and 20 dollars a day in PPA 2005. ADB (2010), Ravallion (2010), and Banerjee and Duflo (2008) adopt as lower border the international threshold of 2 dollars, considering that middle-class begins where poverty ends. This threshold is often criticized because the households with an income between 2 and 4 dollars are still vulnerable (Clément and Rougier 2014) and does not correspond to middle-class on numerous criteria (Birdsall 2010), for example, in terms of their economic interest and political weight. For that reason, other authors choose higher lower borders, for example Clément and Rougier (2014) who fix it at 4 dollars, and Birdsall (2010) and Kharas (2010) at 10 dollars. This threshold constitutes the superior border of the interval retained by Banerjee and Duflo (2008). Ravallion (2010) takes the poverty line of the 13-dollar US; ADB (2010) and Clément and Rougier (2014) 20 dollars; Kharas (2010) 100 dollars.

[7] Those countries are: Albania, Azerbaijan, Bangladesh, the People's Republic of China, Ethiopia, Ghana, Guinea, Indonesia, Kyrgyz Republic, Lao PDR, Madagascar, Mauritania, Mozambique, Nigeria, Romania, Senegal, Sri Lanka, Tajikistan, Tanzania, Uganda, Viet Nam, and Zambia.

[8] Those countries are: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Sweden, and Switzerland.

Figure 1: Middle-class Sub-categories (Average Percentage Share of Population [a] and of Middle-class [b] from 1985 to 2010)



HIC = High-income countries, LIC = Low-income countries, LMIC = Lower middle-income countries, UMIC = Upper-middle-income countries.

Source: Author's calculation based on Povcal data.

Table 2: Ratio of the Upper and Higher Subgroups on the Floating and Lower Subgroups

	Low Income	Lower Middle	Upper Middle	High Income
Mean	0.06	0.22	0.56	31.71
Median	0.03	0.15	0.46	12.32
Min	0	0.001	0	0.19
Max	0.34	2.7	6.12	297.97

Source: Author's calculation.

Table 2 confirms the huge gap between developing—including upper middle-income—and developed countries' middle-classes: on average the middle-classes in developing countries are less wealthy than that of developed ones. Yet, a large "poor" middle-class is likely to have different impacts on socioeconomic aggregates than a large "rich" middle-class. Those statistics highlight the limitation of the use of absolute thresholds to identify a unique global middle-class: its structure matters and makes a huge difference depending on the development level. Furthermore, we can say that besides the need to reduce poverty, another challenge for developing countries is to prompt the transition of bottom middle-class households to higher categories.

2.3 Middle-class Depth:[9] Using the Average Annual Consumption per Capita

Middle-class depth indicates how rich a country's middle-class is on average. As a measure of the depth of middle-class, we will use the average annual consumption per capita of the middle-class. As we recall, the distribution data from Povcal are

[9] The term « depth » is taken from the literature on poverty, but we measure it differently for the middle-class.

based either on consumption or income. For income-based data, we calculate the consumption per capita using the WDI consumption share of GDP. For the developing world, the mean and median are respectively US$2,727.24 and US$2,735.8, while those of developed countries are US$10,107.8 and US$10,148.21, respectively.

Table 3: Middle-class Average Consumption per Capita by Income Category
(US$)

	Low	Lower-middle	Upper-middle	Higher	Developing	Developed	All Sample
Mean	1,702	2,102	3,249	7,456	2,660	8,503	4,152
Median	1,469	1,777	3,286	5,466	2,589	8,145	3,119
Min	530	1,032	974	1,668[(1)]	530	1,791	530
Max	3,222	4,403	6,263	18,481	6,263[(2)]	18,481	18,481

Source: Author's calculation (Values are expressed in US$).[(1)] This is the average consumption per capita of Khazakstan in 2010 which is classified as high income country since that year according to Hout's thresholds classification. [(2)] This is the average consumption per capita of Bosnia and Herzegovina in 2007.

Table 3, reporting computations of the average consumption per capita for each income category, shows a polarized global middle-class, with a striking difference between developed and developing countries. Even in upper-middle income countries, where the size of the middle-class is on average 91%, their average consumption is three times smaller than for the higher-income countries.

2.4 Middle Class Heterogeneity: Dispersion and Concentration

To apprehend the heterogeneity of the middle-class, four aspects will be considered. The first one, namely the distinction between four subcategories of middle-class, has been presented in section 2.2. Second, indicators of statistical concentration and dispersion provide two complementary descriptions of inequality within the middle-class of each country throughout the period.

The middle-class statistical dispersion may give an approximation of what Birdsall (2010, 2014) and Handley (2015) call "class identity." Without being a perfect indicator, it could be a good statistical proxy of the identity dimension of a social class since high-income dispersion within the middle-class would suggest that the different groups of the latter will find it more difficult to share a common identity. Many other socioeconomic features must obviously be taken into consideration when talking about a social class. Nevertheless, people with similar living standards—imperfectly measured by their consumption level—may share common consumption behavior that reflects their needs and aspirations. Thus, the more heterogeneous those behaviors, that reflect a heterogeneous consumption level, the more miscellaneous their impacts on socioeconomic aggregates.

Skewness and Kurtosis characteristics indicate where the density of consumption is concentrated within the middle-class. Using Fisher coefficients of Skewness and Kurtosis, we identify four distribution forms: 1) positively skewed and flat; 2) negatively skewed and flat; 3) positively skewed and thin; 4) negatively skewed and thin. In our sample, we find that most developing countries' consumption distributions exhibit the third form—positively skewed and thin—meaning that consumption is concentrated in the low middle-classes, with a small number of extreme values. High-income countries featuring the first form are those with a significant proportion of their middle-class in the upper middle level. Those with the third form are mostly countries of the

ex-Soviet Union that still have a significant proportion of their population in the lower middle-class.

We now compute[10] a Gini index on the middle-class distribution to get an indication whether middle-class consumption is driven by a small percentage of its population. For the developing world, the mean and median Gini of the middle-class are 18.61 and 20.05, respectively, while those of the developed countries are 20.97 and 20.57, respectively. The overall middle-class—including both developed and developing countries'—mean and median are 19.10 and 20.14, respectively.

Table 4 reports the computations of the Gini statistics for each middle class subgroup of income. The very low levels of the Gini index in the developing world are explained by the fact that in some countries, one subcategory of middle-class encompasses more than 70% of the middle-class population and of middle-class consumption. For instance, in Guinea 98% of the middle-class population belongs to the floating class and their share in middle-class consumption is 98%. At first sight, it seems that the relationship between middle-class inequality and development level is positive: on average, inequality within the middle-class tends to increase with development level.

Table 4: Middle-class Gini Indicator by Income Category

	Low Income	Lower Middle	Upper Middle	High Income
Mean	13.22	13.99	20.63	24.99
Median	12.18	13.69	20.76	24.07
Min	0	1.40	2.96	13.31
Max	23.69	26.18	37.31	43.58

Source: Author's calculation; Gini coefficient varies from 0 to 100 with 0 meaning no inequality/no concentration/perfect equity and 100 very strong inequalities.

To graphically check the relationship between inequality and development, we have plotted both the Gini coefficient of the middle-class and the overall population against GDP per capita and adjusted it by using a nonparametric approach. Figures 2 and 3 show the adjustment by a local polynomial smoothing of degree 3 using the Epanechnikov kernel with a bandwidth determined by rule-of-thumb by default.[11]

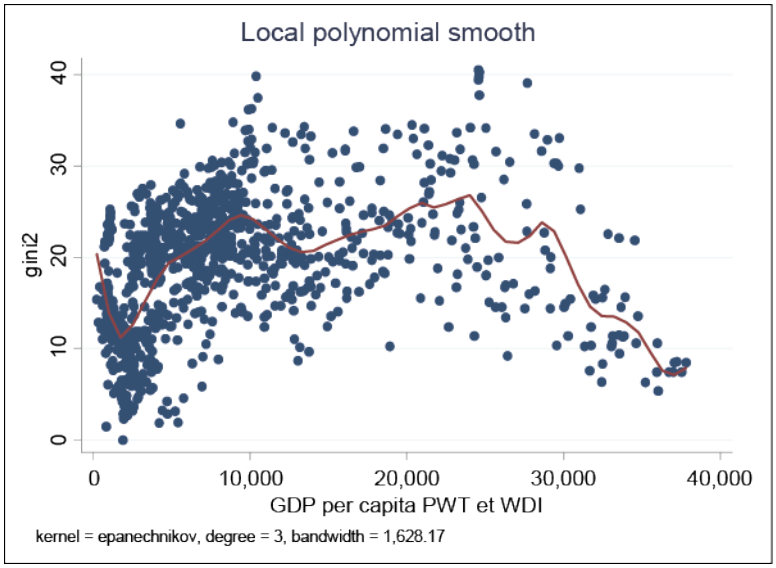
First, although we cannot draw a strong conclusion about the shape of the relationship, it appears to be non-linear. Middle-class income inequality seems to increase until almost US$30,000 and past this income level, corresponding to high-income countries, it tends to decrease. Secondly, Figure 2 supports what we have seen in Tables 2 and 3: the higher the development level, the larger and more economically empowered the middle-class, but a large middle-class does not necessarily imply lesser overall inequality. We remain cautious in the interpretation of the inequality since we are aware of potential data and measure issues, among which the limits of using grouped data (following Knowles 2001; Deninger and Square 1999, to cite just a few studies) even if Povcal is probably the most reliable source for distribution data. To improve the reliability of our results, we will calculate alternate measures of inequality in further

[10] Since we use Stata 12, we compute the Gini index using the command ineqdeco. It is worth noting that grouping leads to a downward bias of the Gini. Following Van Ourti and Clarke (2011), we use a first order correction term to deal with those biaises by treating grouping as a form of measurment error. It consists in multiplying the Gini by $K_2/ (K_2 – 1)$.

[11] Some authors have shown that the quadratic function does not fit the relationship between inequality and development but polynomials of three degrees for OECD and four degree for non-OECD (Li and Zhou 2011). Gallup (2012) finds that the former increases the confidence interval.

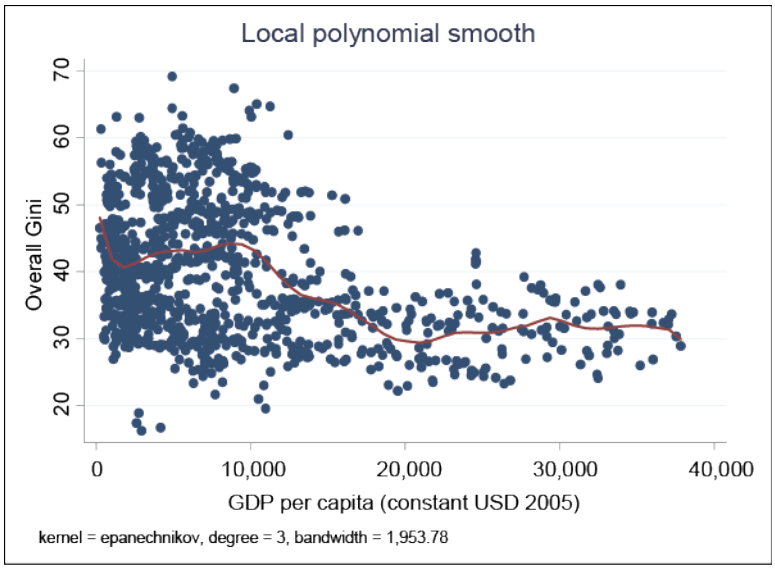
work, as far as our data allows us to do so. Nonetheless, its particular pattern supports the fact that economic transformations are closely linked to what happened specifically at intermediate levels of income. It is confirmed when we look at the evolution of the middle-class's structure, meaning an inversion of the subcategory representation among the population in high- compared with low-income countries.

Figure 2: Middle-class Gini and Development Level 1981–2012



Source: Author's calculation (excluding Ireland, Norway, and the US, as they are outliers).

Figure 3: Overall Gini and Development Level 1981–2012



Source: Author's calculation (excluding Ireland, Norway, and the US, as they are outliers).

2.5 Eight Configurations of Middle Classes

Finally, we construct an ordinal variable with eight modalities corresponding to all possible combinations [12] of the three dimensions of middle-class: size, depth (the average consumption per year) and concentration. To begin with, we shall set thresholds above which a middle-class is considered large, deep or egalitarian. For this purpose, we chose the median value of each indicator. We could have chosen the mean but using the median have the advantage of excluding potential biases linked to extreme values. Thus, a country's middle-class is considered large when it represents more than 87.73% of total population and more than 95.97% of total consumption. Secondly, we have seen in the previous section that there is a huge gap between the higher income countries and the others in terms of average consumption level. To account for this difference, two thresholds will be set. For developing countries, middle-class is considered as deep when its average annual consumption per capita is above 2,735.80 USD whereas for developed countries, their annual consumption should be above 10,148.21 USD. Finally, a middle-class is relatively egalitarian when its Gini index is lower than 20.14.

By combining information on average consumption, concentration, and size, we will identify eight middle-class configurations. The first set of configurations refers to middle-classes that display only one of the three characteristics—1) large but neither deep nor egalitarian; 2) deep but neither large nor egalitarian; and 3) egalitarian but neither large nor deep. The second set is composed of middle-classes that combine two of these three characteristics: 4) large and deep but not egalitarian; 5) large and egalitarian but not deep; and 6) deep and egalitarian but not large. Finally, the ideal configuration would be a 7) large, deep, and egalitarian middle-class, and the worst would be a middle-class that is 8) neither large, nor deep nor egalitarian.

Table 5: Middle-class Configurations by Country Income Level[13]

	Low Income	Lower Middle	Upper Middle	High Income
1) Large but neither deep nor egalitarian		5.64	11.36	24.26
2) Deep but neither large nor egalitarian	16.67	10.53	21.75	0.89
3) Egalitarian but neither large nor deep	76.47	62.42	14.29	1.18
4) Large and deep but not egalitarian	2.94	1.50	14.94	20.71
5) Large and egalitarian but not deep			2.27	8.88
6) Deep and egalitarian but not large		14.29	11.69	
7) Large, deep and egalitarian		3.01	19.48	43.20
8) Neither large, nor deep and egalitarian	3.92	2.63	4.22	

Source: Author's calculation.

First, during the period of study, whilst the worst configuration (neither large nor deep nor egalitarian) can be observed only in the developing world, the shares of countries that display the first or the ideal configurations increases with with higher development levels. In high-income countries, almost half of the countries' middle-classes are indeed large, deep, and relatively egalitarian. Besides, the other most frequently observed configurations for this income level have in common the large size of the middle-class.

[12] $C_3^0 + C_3^1 + C_3^2 + C_3^3 = 8$

[13] We only show the statistics and configurations with more than 2 observations.

We can also see a huge difference between the developed and developing countries for which the second configuration (a middle-class that is relatively wealthy but small and unequal) has frequently been observed. It is quite interesting, since most middle-classes in both low- and lower-middle income countries are only either deep or egalitarian and only very few of them are large or combine two of the criteria. Nevertheless, the middle-class configurations seem to be improving with higher development levels. Indeed, more than 50% of the observations for low-income and middle-income countries correspond to the third configuration: middle-classes that are egalitarian, but neither rich nor large. As we have seen in Figure 1, those countries' middle-classes tend to be mostly concentrated in the floating class or/and lower-middle-class and account for almost the same proportion of total consumption, which may be the reason why their consumption levels are low in value but relatively homogeneous. But, 14% of lower-middle income middle-classes combine two criteria: a higher consumption share and low inequality. And for the upper-middle-income level, the diversity of configuration observed amongst the countries over the study period suggests a modification of the middle-class that is more country- or region-specific.

Table 6 indeed shows that the third configuration is mostly observable in the developing world but less in Latin America and Caribbean countries. For those countries, the middle-class seems to be a smaller (34%) or larger (18%) group with a higher level of consumption on average but with a higher level of inequality. Central Europe and Asia and Middle-East and North African middle-classes configurations are close, with the exception that the ideal configuration is also frequently observed for the former countries. For the period of study, South Asia's middle-classes have been quite homogenous but not wealthy or large enough, which has also been the case for most of Sub-Saharan Africa's countries' middle- classes.

Table 6: Middle-class Configurations by Region[14]

	Central Europe and Asia	Latin America and Caribbean	Middle-East and North Africa	South Asia	East Asia	Sub-Saharan Africa	Western Advanced Countries[15]
1) Large but neither deep nor egalitarian	21.57	1.27	29.41		8.16		23.79
2) Deep but neither large nor egalitarian		34.08				6.93	
3) Egalitarian but neither large nor deep	32.34	9.24	44.12	100	78.57	85.15	
4) Large and deep but not egalitarian	5.99	17.83	8.82		6.12		17.10
5) Large and egalitarian but not deep	5.39						10.4
6) Deep and egalitarian but not large		21.97				3.96	
7) Large, deep and egalitarian	27.54	11.78			2.04		47.96
8) Neither large, nor deed and egalitarian		3.82	14.71		5.10		

Source: Author's calculation.

[14] We only show the statistics and configurations with more than two observations.

[15] In this category, we include Australia and Israel.

Not surprisingly, the middle-class structure, composition, and configuration are quite different according to the development level. On average, the gap between developing and developed countries is huge, notably in terms of average consumption levels and configurations. Nevertheless, middle-class features seem to improve as a country develops. Whilst the enlargement of this intermediate category has often been shown to prompt growth, it seems more interesting to investigate if the other dimensions of middle-class, independent of each other or combined, have different impacts on this aggregate. From this descriptive analysis, we draw our hypothesis, for the empirical investigation: 1) the size of the middle-class is an important characteristic, but the consumption and inequality level may dampen or catalyze its impact on growth; 2) instead of a homogenous positive impact of a singular middle-class, each sub-category of middle-class is likely to have slightly different impacts on growth.

3. ESTIMATING THE IMPACT OF MIDDLE-CLASS ON INCOME GROWTH

We now turn to the empirical estimation of the relationship between middle-class and growth.

3.1 Estimation Issues

As we recall, our panel dataset is unbalanced. Besides, as we have seen in the literature review, without having all been tested, the relationships between middle-class and those economic aggregates may be bidirectional. Endogeneity biases also pertain to reverse causality or measurement errors of the other variables that will be used as explanatory variables. Omitted variables can also be sources of endogeneity bias. Whilst a fixed-effect model could be used, Nickell (1981) shows that the within estimator produces estimations of parameters that are inconsistent and biased downward in the presence of endogeneity. The first-difference Generalized Method of Moments (GMM) estimator may provide biased results for a finite sample size. Besides, the lagged levels of variables are not reliable instruments when dependent and independent variables are continuous.

For those reasons, the appropriate method for us seems to be the two-step system GMM estimator proposed by Blundell and Bond (1998), which can also properly manage an unbalanced dataset as well as address the problem of heteroscedasticity. This system estimator encompasses a regression equation in both differences and levels with their own specific set of internal instrumental variables, namely: 1) a set of equations in first-differences, and with adequately lagged levels as instruments; 2) a set of equations in levels and variables, with adequately lagged first-differences as instruments. Since the two-step estimation may produce downward biased results when using finite samples, Windmeijer (2005) proposes a correction for the variance–covariance matrix.

Two crucial assumptions must be met to ensure the validity of GMM. First, the instruments are exogenous, i.e., not correlated with the error terms. Since we will adjust our estimations for heteroscedasticity, this hypothesis is tested using the Hansen test of overidentifying restrictions. Secondly, if a negative first-order autocorrelation (AR1) in residuals may be acceptable, the absence of second-order autocorrelation (AR2) must be verified. We test it using the Arellano–Bond test for AR1 and AR2. Time dummies will be included to make this assumption hold well by preventing contemporaneous correlation.

Finally, as Rodman (2009) states, a 1-year lag is only consistent for predetermined but not very endogenous variables for which corrections will be minor, but it is not recommended to use too many estimators. We then limit the numbers of lags for our explanatory variables to two.

Our variables of interests are introduced as explanatory variables in different models: dummy variables for each identified configuration (*model 1*), the one we use as reference is the eighth: neither large, nor deep and equal; floating and lower middle-classes' share successively in percentage of population and total consumption (*model 2)*; upper and higher middle classes' share successively in percentage of population and total consumption (*model 3)*; the ratio of top subclasses—upper and higher middle-class to bottom ones—floating and lower middle-class (*model 4);* size, annual average consumption, and Gini both in level and in quadratics terms (*model 5)*.

In addition to our specific focus on middle-class indicators, we are specifically interested in what happen at middle-income level. So, the estimations will be run on identified middle-income countries over the period of study (1985 to 2012). Our control variables are introduced gradually to check for the stability of our results. There are no great changes for our variables of interest except lower coefficients. The results presented in Table 8 are then the full specification. The Hansen test shows that we cannot reject the null hypothesis of the absence of correlation between instruments and error terms for all our models. In addition to that, the Arellano–Bond test for absence of second-order autocorrelation (AR2) is verified for all of our models.

3.2 Estimating the Impact of the Middle-class on GDP Growth

Primarily, we want to check if the different configurations and subcategories of middle-class have significant and specific impacts on development. Our explained variable is the real GDP per capita of country *i* at time *t*. The growth equation we are going to estimate is the following:

$$y_{i,t} = \alpha X_{i,t} + \beta Z_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where X represents our aforementioned variables of interest, Z represents the determinants of growth in the literature, and ε is the error term.

The first set is composed of: i) gross fixed capital formation as a percentage of GDP as a proxy for investment, both public and private, which is supposed to have a positive impact; ii) a demographic determinant—we calculate demographic growth, which is the sum: n + g + δ. n, population growth, is a proxy of fertility, *g* the technical progress growth rate, and *δ* the capital deterioration rate. Following Mankiw et al. (1992), we suppose that g + *δ* is invariant through time and countries and is equal to 0.05. This aggregate is expected to have negative impact on growth. Then, following Mankiw et al., we add secondary and tertiary education achievement rate as a proxy for human capital accumulation. According to the economic level, those variables are not supposed to have the same impacts. While secondary education provides imitators, innovators emerge from tertiary education and for the specific transformations and challenges at play in middle-income countries; the former may have negative outcomes, whereas the latter may have positive outcomes. Thirdly, public expenditure has been shown to be necessary for development (Barro 1996), and even more so if the middle-class is to be considered as an engine of growth (Birdsall 2010; Handley 2015). This is why we introduce government final expenditure as a percentage of GDP. However, another effect may imply a negative sign of this variable since public expenditures are mostly funded by taxation, which may be detrimental to growth.

Foreign direct investment—which we introduce as a percentage of GDP—has also been shown to be a determinant of growth, but depending on its sign, it is either complementary to (Grossman and Helpman 1991) or substitutable for (Luiz and De Mello 1999) domestic investment. Finally, although the idea that institutions are key determinants of growth is widely spread (See for instance Rodrik and Subramanian 2003; Acemoglu et al. 2005), available data and measures are quite tricky. For this purpose, we choose to use a polity2 indicator of democracy. In addition, we control for poverty incidence in model 2 and for rich population share in models 3 and 4.

Concerning our control variables, investments (in model 4), tertiary education (in model 3), public expenditures (in model 2 and 3), and polity2 in the three models are, as expected, significant and positive.

As for middle-class configurations, the coefficients are not significant for model 3 and 5. In the other estimations, we can see that 2) deep; 4) large and deep; and 7) large, deep, and egalitarian middle-classes have positive impacts on economic growth. The coefficients are higher for the last two configurations. This result suggests that, for middle-income countries, the income level of the middle-class is a crucial condition to ensure economic growth. The coefficient for the seventh configuration is even lower than for the fourth, suggesting that a middle-class that is large and with higher consumption capacity even if it is quite unequal is more likely to have a positive impact in terms of growth. The fact that middle-class income level matters is again confirmed in model 4. Indeed, the expansion of upper middle-class' consumption share, relatively to floating and lower middle-class, has positive and strongly significant effects on growth. When the share of rich people in the total population is introduced, it is positive, whereas the share of top middle-class in the population is insignificant.

Table 7[16]: Estimates of GDP per Capita (Constant US$ 2005) on Middle-class Indicators using FEGMM Estimator

	Model 1	Model 2	Model 4
Configuration 1	4,907		
	(3,127)		
Configuration 2	4,132**		
	(2,108)		
Configuration 3	886.8		
	(2,214)		
Configuration 4	6,617***		
	(2,223)		
Configuration 5	3,682		
	(2,792)		
Configuration 6	3,486		
	(2,301)		
Configuration 7	5,391**		
	(2,493)		
Floating MC (% population)	–94.09**	–108.9*	
	(36.74)	(66.45)	
Lower MC (% population)	–19.64	–67.97	
	(45.71)	(111.6)	

continued on next page

[16] We report estimates in which our interest variables are significant.

Table 7 *continued*

	Model 1		Model 2			Model 4	
Poverty headcount ratio			–48.94				
			(101.0)				
Floating MC (% consumption)				–39.98	–64.19*		
				(48.34)	(36.77)		
Lower MC (% consumption)				–89.25***	–85.22		
				(33.22)	(66.25)		
Poor (% consumption)					–51.87		
					(79.59)		
Ratio (% population)							30.25
							(64.33)
Ratio (% consumption)						1,177***	
						(387.4)	
Rich (% consumption)							4,195**
							(1,807)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3,662	5,544**	9,163	5,786**	11,183*	3.579**	3,902
	(4,039)	(2,379)	(10,635)	(2,825)	(6,349)	(1,699)	(3,029)
Observations	441	453	453	444	444	444	453
Number of country2	41	41	41	41	41	41	41
Hansen test of over identification	2.92	2.41	3.02	4.66	10.14	5.36	7.13
	0.405	0.878	0.883	0.588	0.181	0.373	0.309
Arellano–Bond test for AR(1)	–1.61	1.77	1.87	1.04	2	2.229	0.32
	0.108	0.077	0.061	0.296	0.046	0.022	0.748
Arellano–Bond test for AR(2)	–1.37	–0.89	–043	–0.32	0.26	–0.64	–0.78
	0.169	0.375	0.665	0.752	0.792	0.521	0.435

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Those findings are consistent with the argument of Birdsall et al. (2000). They point out that the public discourse tends to ignore average households thereby contributing to the vulnerability of this middle-class. According to the authors, during the last decade, public spending has been allocated more and more to specific social programs for the poor. Middle-class households are not concerned since they seem “too rich” to benefit from social programs. Yet, they are not rich enough to be able to constitute consequent savings that are necessary to ensure their resilience. In many countries, politics have favored pro-poor programs to the detriment of services aimed at the middle-classes, which have seen the quality of their public services deteriorate as a result lack of public financing (this is the case, for example, in the Czech Republic, Egypt, Mexico, and Brazil). With regard to our results on floating and lower middle-class, and the lack of significance of the top middle-class categories, this statement seems to be especially true for middle-income countries. Indeed, compared to low-income countries, the latter faces different challenges and needs other growth drivers, among which the differentiation of production through innovation that can be prompted by middle-class consumers (Matsuyama 2012). In another work, we found that the expansion of the top middle-class is a driver of productive change since it supports manufacturing and its modernization (diversification and sophistication) and reduces the share of non-modern activities. Reducing poverty is obviously a priority, but for middle-income countries to

catch up with the high-income ones, the challenges are both to reduce poverty and to improve the well-being of the households that have successfully escaped from poverty. Thus, policies aimed at improving the well-being, capabilities, and opportunities for those households are necessary to avoid a "stuck in the middle" phenomenon—meaning a floating and lower middle-class bulge with slow transition to superior categories—that is detrimental to growth.

4. CONCLUSION

The objective of this paper was to contribute to the literature on the middle-class at the macroeconomic level by taking into account dimensions other than its size, and reverse causality, which is a possible source of endogeneity. Using data from Povcal, we construct an unbalanced panel dataset of 120 countries from 1985 to 2012. First, we identify eight types of middle-class based on three criteria: size, inequality, and average consumption level. Then, instead of considering the middle-class as a single entity, we identify four sub-categories of a country's middle-class according to their consumption/income level: a floating class (from US$2 to US$4); a lower middle-class (from US$4 to US$10); an upper middle-class (from US$10 to US$20); and a higher middle-class (from US$20 to US$100). This paper investigates if such internal features of the middle-class as depth or heterogeneity impact economic development. The existence of reverse causality between the former economic aggregates and middle-class has been pointed out in the previously existing literature and cannot be ignored in an empirical model. Besides, the traditional determinants of growth are endogenous. To answer our specific question, we address the endogeneity issue using a two-step system GMM estimator (Blundell and Bond 1998) with Windmeijer's (2005) finite sample correction for the variance-covariance matrix. We run estimates specifically on a reduced sample of 52 countries at middle-income level.

In a preliminary analysis, we look at the specificity of each development level when considering growth from the middle-class perspective. We found that whilst most countries, even low-income ones, have all four sub-categories of middle-class and that they account for more than two thirds of total consumption, there is a huge gap between developed and developing countries (including upper middle-income countries) whose average consumption is at least three times lower than that of developed countries. Our empirical results are consistent with our hypothesis and descriptive statistics: for middle-income countries, the size of a middle-class alone is not what matters the most for growth. A wealthier middle-class is what positively impacts growth and the impact is more important when it is combined with the size. Given the low share of higher middle-class in middle-income countries in particular, upward mobility between subcategories of middle-classes seems rather difficult in middle-income countries. There is also the possibility of downward transition. Besides, an increase of the floating-class size, which is composed with vulnerable middle-class households that barely escaped from poverty, has negative impacts on growth. This suggests that, to take full advantage of the dynamics behind the expansion of this intermediate class, middle-income countries should design policies that are consistent with the needs of middle-class households and increase their resilience.

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APPENDIX

Table 8: Data and Sources

Variables	Source	Period
Headcount ratios Consumption/Income share by decile Mean household consumption/income	PovcalNet (PPP 2005)[17]	Survey years during the period 1985–2010 2010 being the year with most observations (62 countries)
GDP per capita (US$ constant 2005)	Penn World Table; World Development Indicators (PWT 8.1)	1985–2012
Gross fixed capital formation (% GDP)	UNCTAD	1985–2012
Population (growth rate in %)	World Development Indicators	1985–2012
Secondary and tertiary education achievement (%)	Barro and Lee(2013)	1985–2012
Government final expenditure (% GDP)	World Development Indicators	1985–2012
Foreign Direct Investment (% GDP)[18]	UNCTAD	1985–2012
Sectoral share of value added (% total value added)	UNCTAD	1985–2012
Economic complexity index	Atlas of economic complexity	1985–2012
Labor force (total and agriculture share)	UNCTAD	1985–2012
Urban population (% total population)	World Development Indicators	1985–2012
Trade openness (exports + imports in % of GDP)	UNCTAD	1985–2012
Domestic credit to private sectors (% GDP)	World Development Indicators	1985–2012

GDP = gross domestic product, PPP = purchasing power parity, UNCTAD = United Nations Conference on Trade and Development, US = United States.

[17] For the PRC, India, and Indonesia, we complete national data with the weighted mean of urban and rural data.

When there is more than one survey for a year, we calculate the mean when the types of data (consumption or income) are the same, and use the consumption data as they are when they are different.

[18] Yemen: FDI data are that of the democratic republic of Yemen (1980–1990) because of the lack of information from UNCTAD.

Table 9: Countries by Region

Eastern Europe and Central Asia	Latin America and Caribbean	Middle-East and North Africa	South Asia
Albania	Bolivia	Algeria	Bangladesh
Armenia	Brazil	Egypt, Arab Rep.	India
Azerbaijan	Chile	Iran, Islamic Rep.	Nepal
Belarus	Colombia	Jordan	Pakistan
Bosnia and Herzegovina	Costa Rica	Morocco	Sri Lanka
Bulgaria	Dominican Republic	Tunisia	
Georgia	Ecuador	West Bank and Gaza	
Kazakhstan	El Salvador	Yemen, Rep.	
Kyrgyz Republic	Guatemala	Israel	
Macedonia, FYR	Honduras		
Moldova	Jamaica		
Romania	Mexico		
Serbia	Nicaragua		
Tajikistan	Panama		
Turkey	Paraguay		
Turkmenistan	Peru		
Ukraine	Trinidad and Tobago		
	Uruguay		
	Venezuela, RB		

Subsaharan Africa		East Asia	Western Europe and North America	
Benin	Mauritania	Cambodia	Australia	Poland
Botswana	Mauritius	PRC	Austria	Russian Federation
Burkina Faso	Mozambique	Indonesia	Belgium	Slovakia
Burundi	Niger	Lao PDR	Canada	Slovenia
Cameroon	Nigeria	Malaysia	Croatia	Spain
Central African Republic	Rwanda	Philippines	Czech Republic	Sweden
Chad	Senegal	Thailand	Denmark	Switzerland
Congo, Rep.	Sierra Leone	Timor-Leste	Estonia	United Kingdom
Cote d'Ivoire	South Africa	Viet Nam	Finland	United States
Ethiopia	Swaziland		France	
Gambia, The	Tanzania		Germany	
Ghana	Togo		Greece	
Guinea	Uganda		Hungary	
Guinea-Bissau	Zambia		Ireland	
Kenya			Italy	
Lesotho			Latvia	
Madagascar			Lithuania	
Malawi			Netherlands	
Mali			Norway	

PRC = People's Republic of China.