

Sizing Up the Middle Class in Developing Countries

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It is tempting to look at the massive population and relatively strong growth forecasts in developing countries and see opportunity for real estate investors. But for those considering real estate ventures in these markets, the total population and gross domestic product (GDP) of a country are secondary. What matters most is the number of people in those countries who earn enough to use institutional-quality real estate and the economic output they generate. For example, according to our estimate, only 9.5% (127 million) of China's 1.3 billion population is today considered middle class. In India, the numbers are more extreme. Only 2.5% (29 million) of its 1.1 billion population is middle class.

Given the vast potential for growth, the size of the middle class is a critical component for real estate investors who are attracted to the growth story of emerging markets. Unfortunately, estimates of the current and future size of the middle class in the developing world are not readily available on a consistent or global basis. To remedy this lack of information, we have developed a methodology that can be applied to all developing countries to estimate both the size and economic power of the middle and affluent classes at any point in time. The methodology, which uses readily and publicly available data, should enable us to better understand the size and growth potential of the middle class in developing countries. In the six countries that we study,

our methodology projects a rapid expansion of the middle class over the coming two decades. In this report, we share our methodology and the results, giving investors the tools to make informed decisions.^{1,2}

DEFINITIONS AND GROUND RULES

For purposes of this analysis, we use the term *middle class* to describe the middle and affluent economic classes in developing countries, because both are the target clienteles of modern real estate. Hence, estimates of the size of the middle class contained herein include not only those individuals who fall within the more narrowly defined middle class based on income or wealth, but also individuals who might otherwise be considered affluent or rich.

We will focus on Brazil, China, India, Mexico, Russia, and Turkey, which combined have a total population of 3 billion and a \$10 trillion GDP. Not only are they the largest developing nations in terms of GDP, they are regionally representative and have different drivers of economic growth. Industrialization and urbanization are powering China and India. Russia and Brazil profit from high energy and commodity prices. And Mexico and Turkey are integrating with giant neighbors. Over the next two decades, the GDP of these six countries is expected to grow at a nominal rate of 8.8% per year, which is double the 4.4% annual growth rate projected for the U.S.

Such a rate of growth will propel the combined GDP of the six developing countries to more than one-and-a-half times that of the U.S. by 2028 (Exhibit 1).

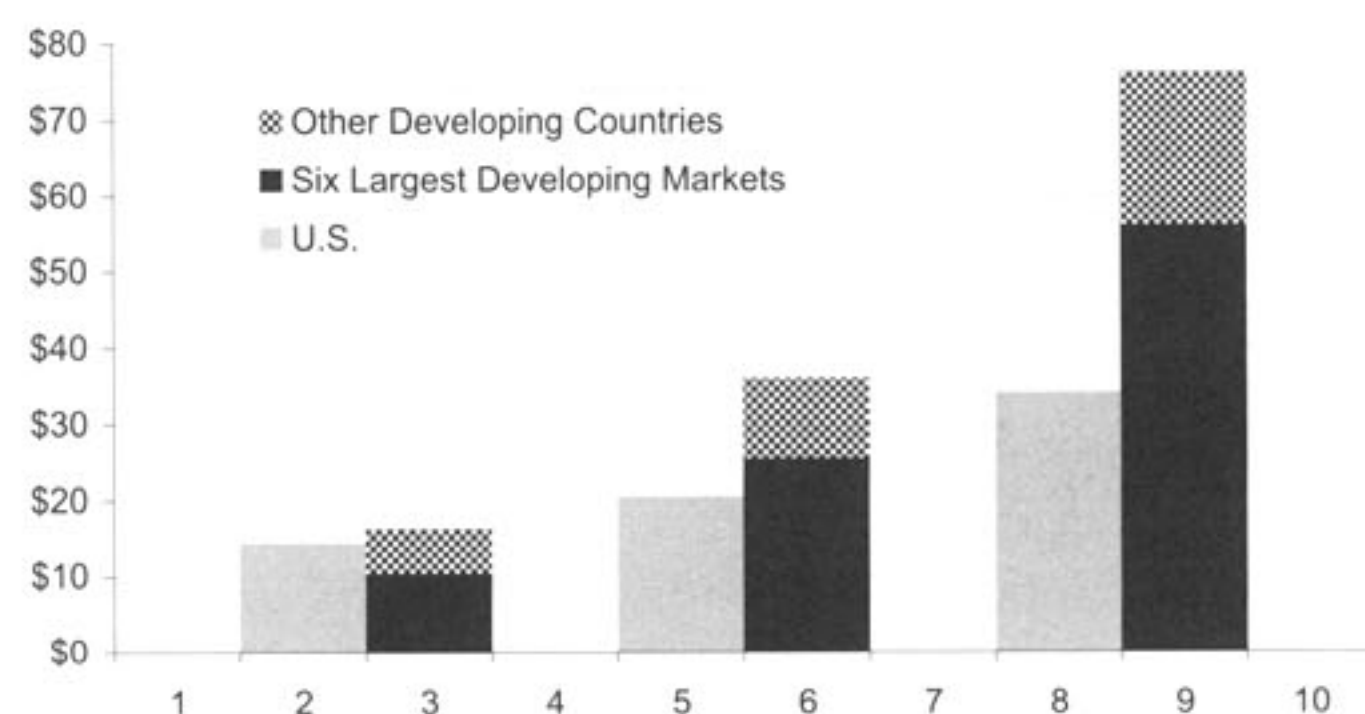
Exhibit 2 underscores the diversity that exists across the six countries in terms of their size and current level of economic development. China is the largest of the six emerging nations in population (1.3 billion) and GDP (\$4.2 trillion). Russia and Brazil are distant seconds in terms of GDP, with approximately \$1.6 trillion each. However, China has the second-lowest per capita GDP, ahead of only India.

METHODOLOGY

The first step in our calculations is to select an appropriate probability distribution for estimating the dispersion of wealth, income, and productivity in each country. For

EXHIBIT 1

Emerging Markets on a High-Growth Trajectory



Notes: Six largest developing markets include Brazil, China, India, Mexico, Russia, and Turkey; Economist Intelligence Unit (EIU, projections as of December 2008).

EXHIBIT 2

Snapshot of the Six Largest Developing Countries

	GDP (US\$ bil.)	GDP Per Capita (US\$)	Population (mil.)
Brazil	\$1,558	\$8,120	192
China	\$4,196	\$3,160	1,329
India	\$1,175	\$1,020	1,148
Mexico	\$1,038	\$9,440	110
Russia	\$1,650	\$11,630	142
Turkey	\$743	\$10,340	72
Total	\$10,360		2,993

Note: EIU (data as of December 2008).

this, we employed the Pareto distribution, which is best known for its long and thick tail to the right when plotted on a linear scale, a feature that distinguishes it from the more familiar normal distribution. More importantly, it provides a good model for describing any distribution in which a relatively small proportion of the population accounts for a large share of the variable in question, such as wealth. In general terms, the Pareto distribution demonstrates that most of the wealth in a society is owned by a relatively small percentage of the population.

The standard Pareto model used to estimate the size of the middle class depends on two readily available economic variables: GDP per capita and the Gini coefficient, a common statistical measure of the dispersion in income, wealth, or economic productivity in a given population.³ The value of the Gini coefficient ranges between zero and one, with a higher number indicating more unequal distribution. Developing countries tend to have greater income and wealth inequality than most developed nations (Exhibit 3).

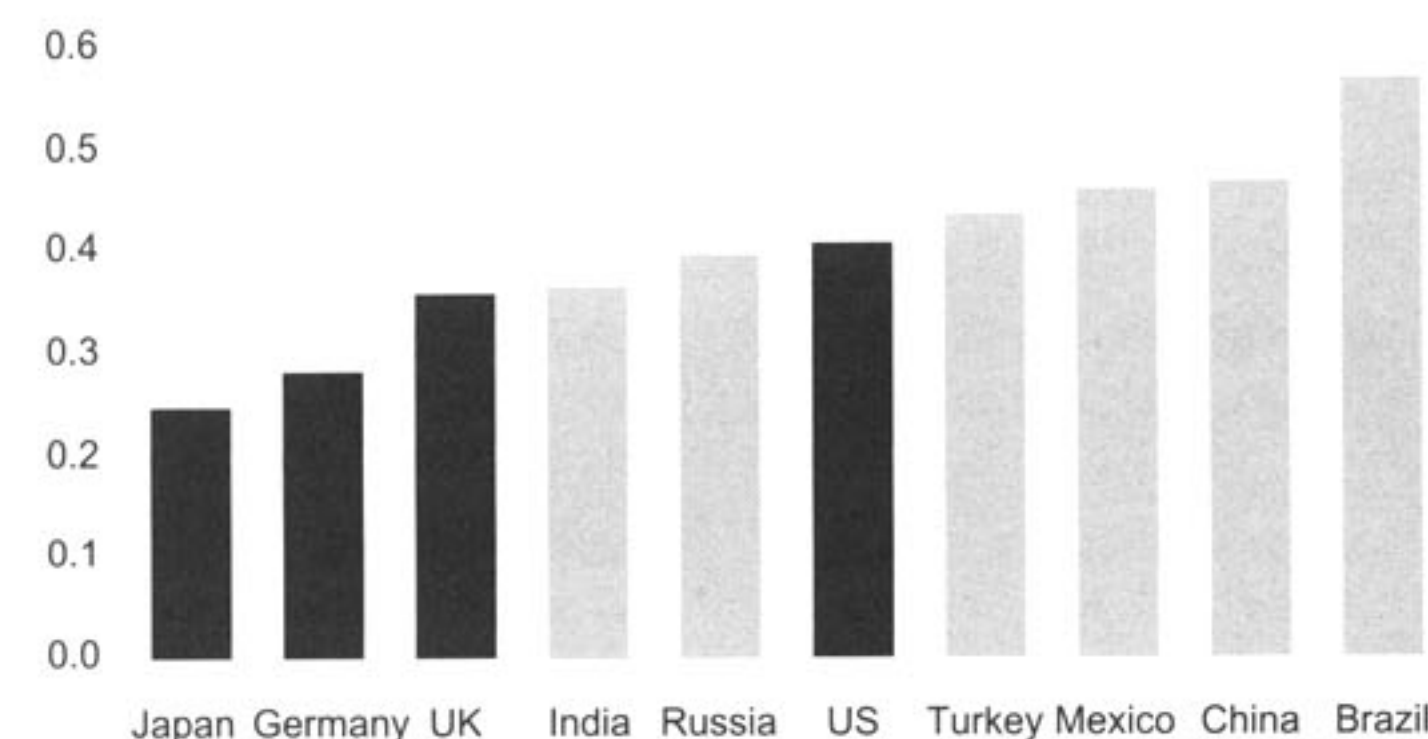
We use GDP per head (GDH in the following formulas) as a measure of economic productivity or wealth per person in a society. If GDH is a random variable with a Pareto distribution, then the probability that GDH is greater than some number, say GDH_{mc} , is given by

$$\Pr(GDH > GDH_{mc}) = \left(\frac{k}{k-1} \times \frac{GDH_{mc}}{\mu} \right)^{-k} \quad (1)$$

The distribution is defined by two parameters, k (a positive number), and μ (average GDP per capita for a country). If GDH_{mc} is properly selected to represent a

EXHIBIT 3

Greater Inequality in Developing Markets



Note: United Nations Development Program (UNDP).

cutoff point between the middle class and the lower class in terms of economic output, Equation (1) is the population share of the middle and affluent classes relative to the total population.

The mathematical relationship between the Gini coefficient, G , and parameter k in Equation (1) is

$$k = \frac{1}{2} \left(1 + \frac{1}{G} \right) \quad (2)$$

Equation (1) can, therefore, be rewritten as

Population share of the middle class

$$= \left(\frac{G+1}{1-G} \times \frac{GDH_{mc}}{\mu} \right)^{-\frac{1}{2}(1+\frac{1}{G})} \quad (3)$$

Total middle class population

$$= (\text{Population share of the middle class}) \times (\text{Total national population}) \quad (4)$$

GDH_{mc} is the minimum GDP per capita that qualifies a person as middle class in terms of economic output. The average GDP per capita for the middle class, however, is substantially higher than the minimum and is given by

$$\text{Average } GDH \text{ for the middle class} = \frac{G+1}{1-G} \times GDH_{mc} \quad (5)$$

The total GDP produced by the middle class is obtained by multiplying the average GDH for the middle class, which is the result of Equation (5), by the middle class population. Hence, the percentage of the national GDP produced by the middle class is simply the GDP produced by the middle class divided by the national GDP. This can also be calculated directly as follows:

GDP share of the middle class

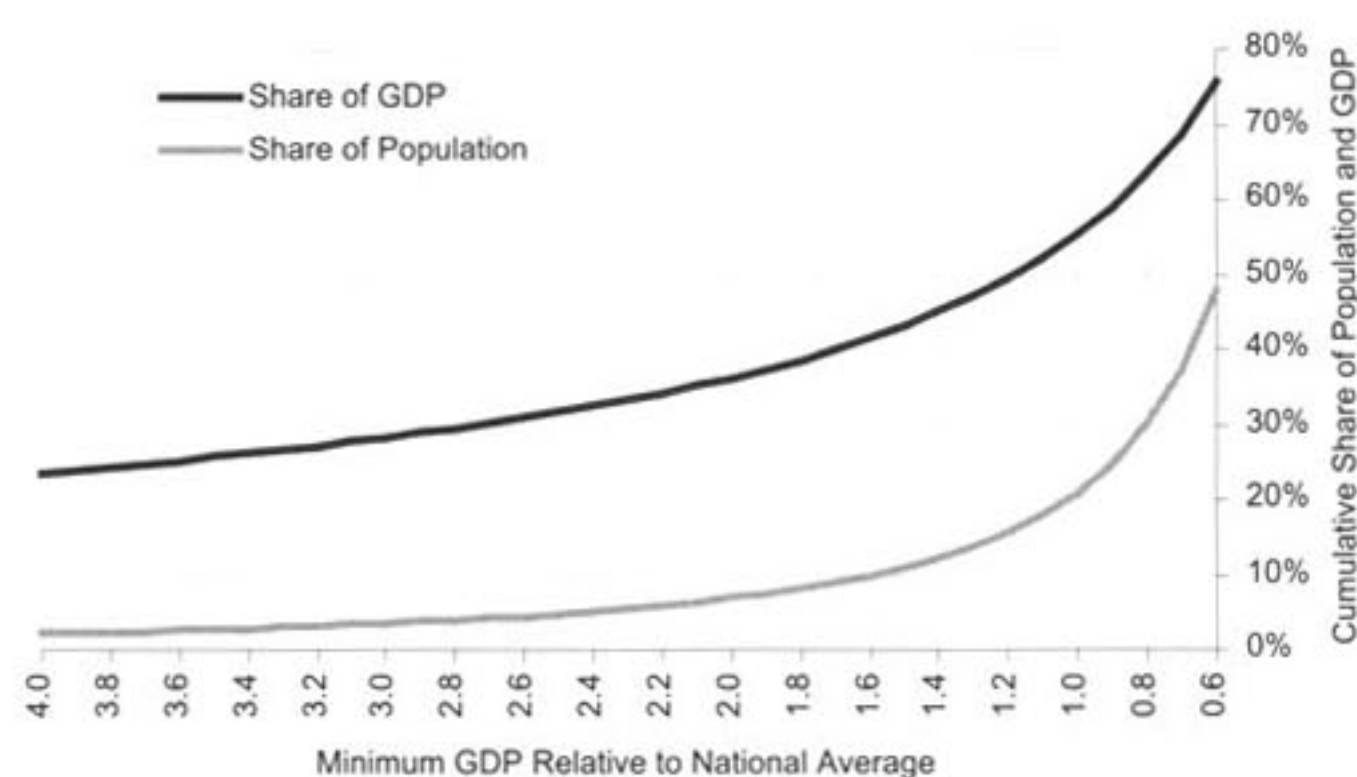
$$= (\text{Population share of middle class}) \times (\text{Population share of middle class})^{\frac{-2G}{1+G}} \quad (6)$$

Exhibit 4 illustrates a scaled depiction of the Pareto model's output of the size and economic productivity of the middle class for different thresholds of GDP per capita, assuming a Gini coefficient of 0.45, which is typical of many developing countries. For illustration purposes, GDP

per capita (shown along the x-axis) is scaled to multiples of the national average GDP per capita such that a value of 1.0 along the x-axis indicates a minimum middle class threshold that is equal to the national average GDP per capita. As shown, the model estimates that for a cutoff equal to the national average GDP per capita, the proportion of the population that meets or exceeds the minimum threshold is about 21% of the total population, but accounts for more than 55% of GDP. If we were to set the middle-class cutoff at twice the national average of GDP per capita, the proportion of the population that qualifies would constitute only 7% of the total population, but contribute 36% of the national GDP.

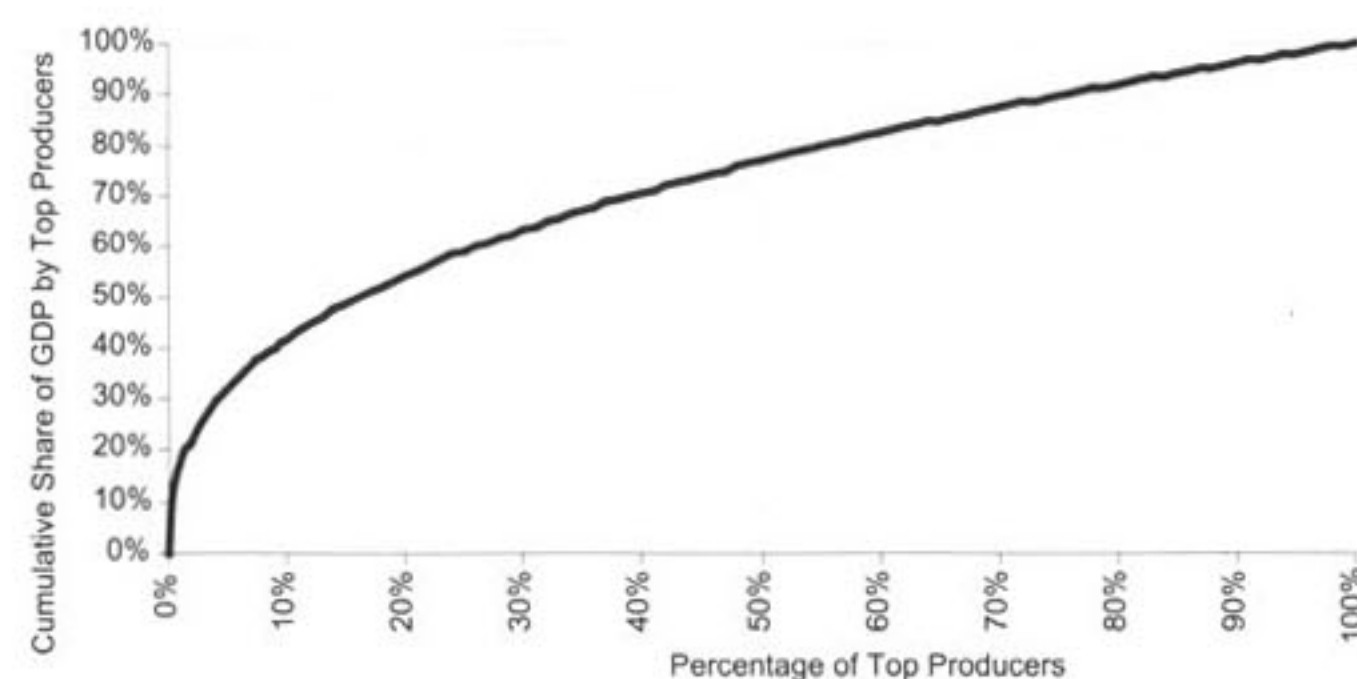
Exhibit 5 shows the model's output of the cumulative share of the GDP produced by the top producers. For example, the top 7% producers contribute 36% of

EXHIBIT 4 Simulation of the Pareto Model



Note: Simulation assumes a Gini coefficient of 0.45.

EXHIBIT 5 Greater Productivity of the Top Producers



Note: Results assume a typical Gini coefficient of 0.45.

national GDP, top 10% produce 42%, top 20% generate 54%, and top 50% contribute 77%. These numbers are, however, dependent on the income inequality assumption. The charts in Exhibits 4 and 5 were created with an assumed Gini coefficient of 0.45.

If a different Gini assumption is used, the position of the curves will shift, although the general shape will remain the same. The top and bottom panels of Exhibit 6 illustrate this point.

The next step in our methodology is to determine a minimum threshold output level (GDP per capita) to define the lower boundary of the middle class, which will be used as an input, along with the Gini coefficient, in the Pareto model. Instead of defining the minimum income level of the middle class in each country in terms of the respective national per capita GDP, we set a global threshold level for all the countries in order to make our analysis

globally comparable. Although the model will produce results for any estimate of a minimum GDP-per-capita threshold, we assume a current global cutoff of \$10,000 as a starting point for the middle class based on the experience of newly industrialized Asian economies, such as South Korea, Taiwan, Hong Kong, and Singapore, as well as southern European countries, such as Spain and Portugal. A minimum GDP per capita of \$10,000 translates into an average GDP per capita of \$26,000 for the middle class (those who produce a GDP of \$10,000 or more per head) for a typical Gini coefficient of 0.45. An average GDP per capita of \$26,000 (\$23,000 for a Gini coefficient of 0.4 and \$30,000 for a Gini coefficient of 0.5) compares favorably with the GDP per capita of industrialized countries.

To obtain estimates of the minimum threshold level in the past and future, we modified the threshold level each year based on the actual or projected U.S. inflation rate (Exhibit 7). For example, when adjusted for inflation, the threshold was about \$8,500 in 2003, and it is projected to be a little above \$10,600 in 2013.

Finally, because the purchasing power of \$1 is not uniform across countries, we translated the \$10,000 global middle-class threshold into individual country cutoffs using purchasing power parity, or PPP, which takes into account differences in the prices of the same basket of goods and services in different countries relative to the U.S. Using a PPP-based income threshold to define the starting point for the middle class in each country enables us to account for the relative cost of living and inflation rates of the countries that have vast differences in living standards. As Exhibit 8 shows, a standard basket of goods and services costs significantly less in the six emerging countries included in our study than what it costs in the U.S. China's PPP, for example, is 0.51, which says that a basket of goods and services that costs \$100 in the U.S. will cost \$51 in China.

Multiplying each country's PPP by the \$10,000 global threshold creates a minimum per capita GDP that we define as middle class in each country. That definition translates into a local middle-class threshold of \$5,200 for China and \$3,500 for India, the latter of which has a PPP of 0.35 relative to the U.S.

EXHIBIT 6

Population and GDP Shares of the Middle Class are Sensitive to Gini Coefficient Assumption

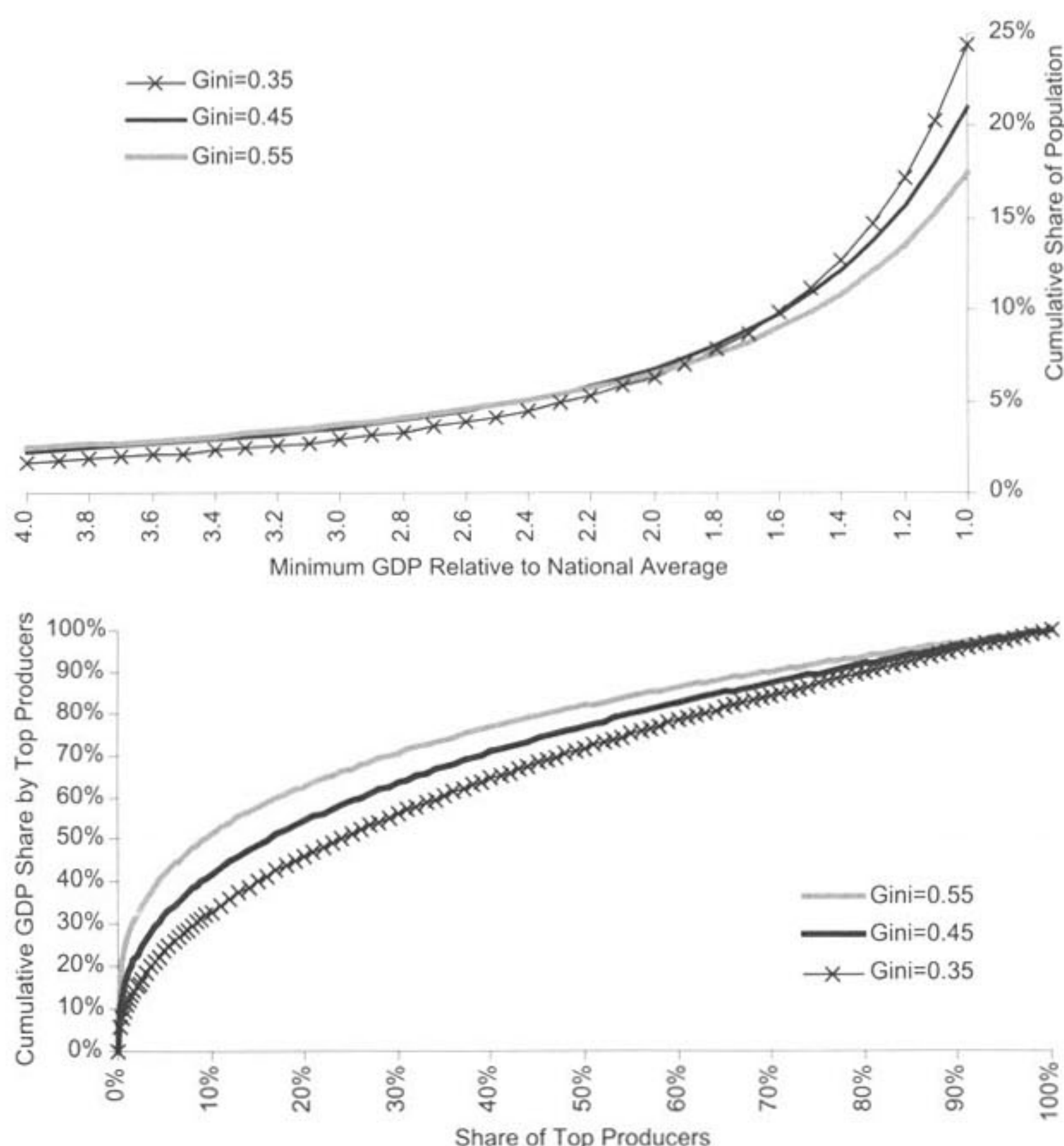
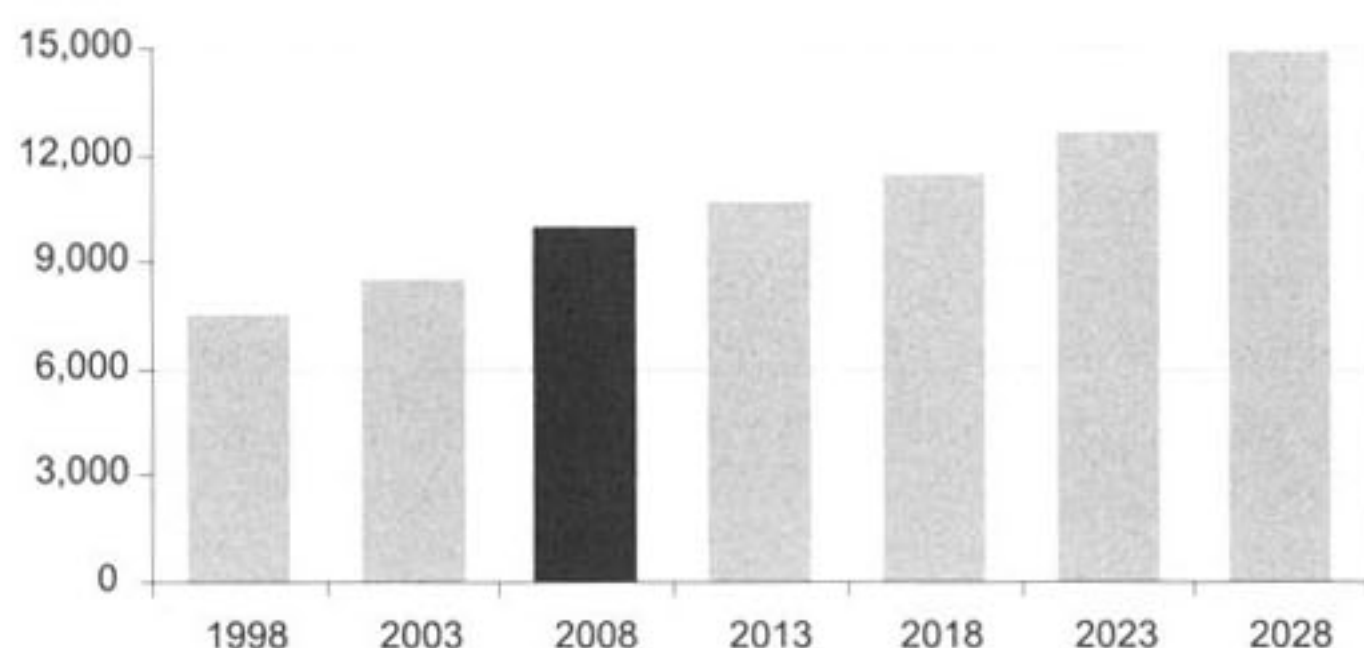


EXHIBIT 7

Adjusting Global Minimum Productivity of the Middle Class by U.S. Inflation



Note: EIU.

EXHIBIT 8

Income Inequality and Cost-of-Living Differences

	Gini Coefficient	Purchasing Power Parity (PPP)
Brazil	0.57	0.78
China	0.47	0.51
India	0.37	0.35
Mexico	0.46	0.66
Russia	0.40	0.71
Turkey	0.44	0.79

Note: EIU.

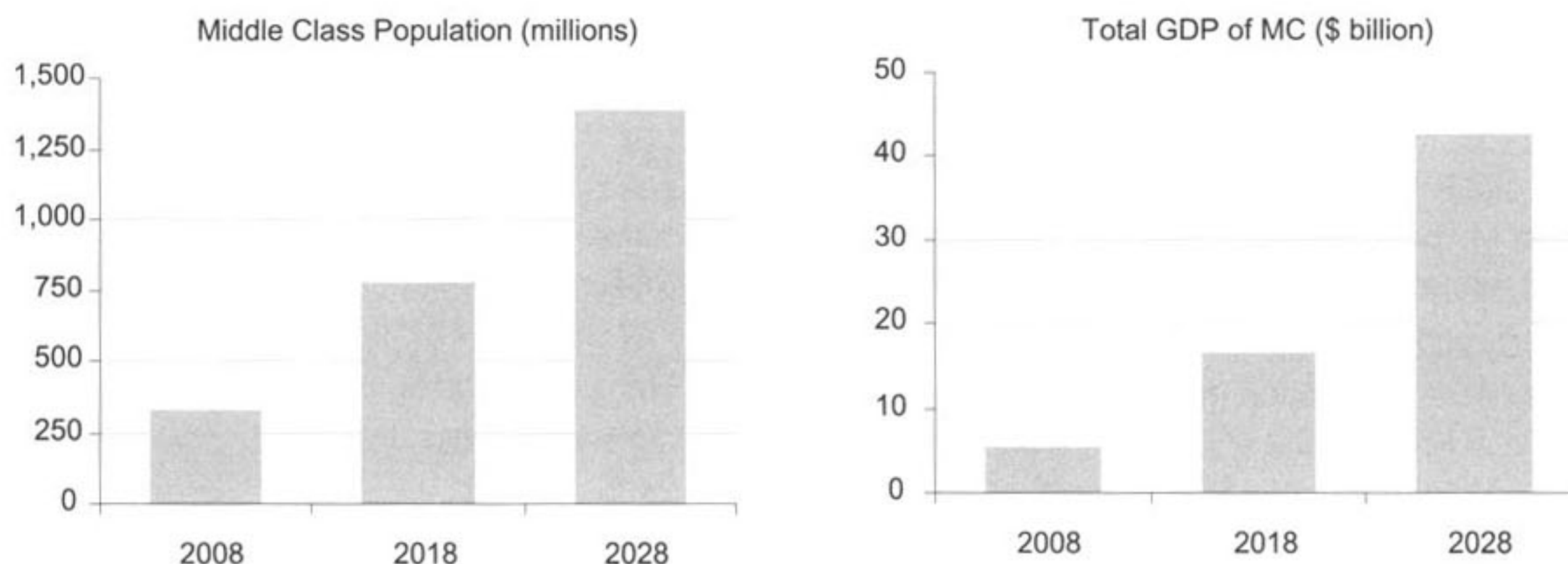
GROWING ECONOMIC POWER OF THE MIDDLE CLASS

With our estimates of the minimum GDP per capita thresholds for each country, we can derive the size and productivity of the middle class in each nation based on the Gini coefficient, per capita GDP, and local threshold GDP levels for the middle class.⁴ Current Gini coefficient numbers are obtained from the United Nations Development Program (UNDP). We estimated future levels of Gini coefficients in each country from the current level of wealth and income inequality, projected growth rates, and level of economic development. GDP per capita and PPP are based on estimates and projections from the Economist Intelligence Unit (EIU).

According to this analysis, there will be a sharp increase in the size of the middle class in the six emerging countries (Exhibit 9). If GDP grows as projected, the middle-class ranks will increase by 9% per year for the next 10 years and by 6% per year for the following decade. That would bring the total size of the middle class in those countries to 776 million in 2018 and to 1.4 billion by 2028, up from 329 million today. Put another way, an average of 53 million people would join the middle class each year over the next two decades in these six emerging markets alone. China and India would see the most dramatic jump, growing about 10% per year for the entire 20-year period. The other large emerging markets may have more modest, but highly respectable, growth rates.

EXHIBIT 9

Large Growth in the Size and Economic Power of the Middle Class



Note: Six largest developing countries only; EIU; UNDP (data as of 2008).

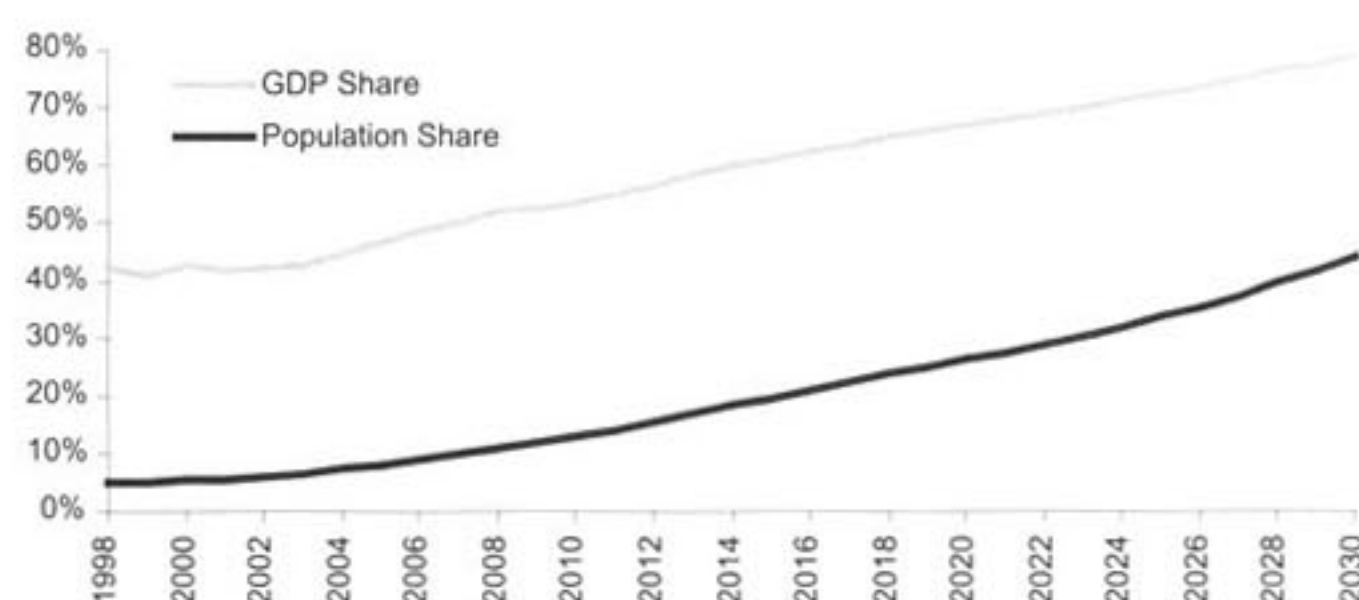
Even more dramatic is the increase in total economic productivity of the middle class, created by relatively high economic growth and middle-class population growth in the developing world. In the next decade, the GDP produced by the middle class in the six nations is projected to grow by a steep 11.8% per year. That translates into \$16.6 trillion by 2018, up from \$5.4 trillion today. GDP produced by the middle class is expected to continue growing by almost 10% per year between 2018 and 2028,

eventually reaching \$43 trillion in 2028, which exceeds the \$34 trillion GDP projected for the U.S.

The middle class in emerging countries produces a disproportionately high level of GDP compared to its size (Exhibit 10). In 2008, the middle class of the six countries constituted only 11% of the population, on average, but produced a whopping 52.4% of the GDP. By 2018, the middle class is projected to swell to 24% of the population and to produce 65% of GDP. By 2028, some 40% of the population will qualify as middle class, generating 76% of GDP.

EXHIBIT 10

Middle Class Wields Disproportionate Economic Power



Note: Six largest developing countries only; EIU; UNDP.

COUNTRY-SPECIFIC GROWTH TRAJECTORIES

Exhibit 11 estimates the size of the middle class and its productivity in individual countries, both in terms of absolute numbers and as a percentage of population. Today China stands well above the other five countries in size, with a middle class of 127 million that contributes \$1.8 trillion of GDP. Russia is next, with a middle class of 75 million that generates \$1.3 trillion of GDP. China and Russia are projected to maintain their lead over the next decade, with India moving up to third place from fifth. But India is projected to leapfrog over Russia and move

EXHIBIT 11

Estimated Size of the Middle Class and Its Productivity in the Largest Developing Countries

	Brazil	China	India	Mexico	Russia	Turkey	Total/Average
Panel A: 2008							
Middle Class Population (mil.)	35	127	29	40	75	24	329
% of Total Population	18%	10%	3%	36%	53%	33%	11%
GDP of Middle Class (US\$ bil.)	966	1789	220	713	1256	483	5428
% of National GDP	62%	43%	19%	69%	76%	65%	52%
Panel B: 2018							
Middle Class Population (mil.)	69	379	93	67	129	40	776
% of Total Population	32%	27%	7%	55%	95%	51%	24%
GDP of Middle Class (US\$ bil.)	1746	7816	1367	1279	3282	1067	16557
% of National GDP	68%	61%	36%	79%	98%	77%	65%
Panel C: 2028							
Middle Class Population (mil.)	111	763	218	106	128	66	1391
% of Total Population	48%	53%	15%	79%	100%	79%	40%
GDP of Middle Class (US\$ bil.)	3748	23736	4881	2405	5602	2284	42657
% of National GDP	78%	79%	48%	92%	100%	91%	76%

Note: EIU; UNDP.

into second by 2028, behind only China in size and production of its middle class.⁵

We should emphasize that our results are based on the most recent EIU projections for GDP and population growth and our forecasts for Gini coefficients. Alternative assumptions about GDP and population growth and Gini coefficient forecasts can have a significant impact on the statistics. The model is also flexible enough to accommodate alternate assumptions about the global threshold level for defining the middle class.

CONCLUSIONS

Calculating the growth of the middle class in developing countries is no mere academic exercise, given that a certain level of wealth is needed for individuals to have the means to use modern real estate. Our model can be applied to virtually all developing countries, because it uses only readily available data, such as GDP per capita, the Gini coefficient, and purchasing power parity. It is a simple and yet powerful tool for real estate investors to estimate the size of their target market in less-developed countries.

Because the size of the middle class in the six developing countries we model is tiny in relation to the total population, even modest economic growth will produce a substantial increase in the number of people who can use institutional real estate. Given the projections for robust growth in those nations over the long term, notwithstanding the short-term fluctuations, growth of the middle class is likely to be dramatic. Our model projects the middle class in the six largest developing countries alone will climb to 40% of the population, or 1.4 billion, by 2028. Moreover, the contribution of the middle class populace to total economic output, which will surpass 75% of national GDP by 2028, far exceeds its proportion of the population. In 20 years, the 1.4 billion middle-class population in the six developing nations will control more than \$54 trillion of global GDP, exceeding the projected \$34 trillion size of the entire U.S. economy.

That growth will translate into a great deal of demand for institutional real estate, such as apartment complexes, malls, offices, and hotels.

ENDNOTES

¹The views expressed in this article are the views of the authors as of the date of this publication and do not necessarily reflect the views of PREI® or Prudential Financial, Inc.

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³The United Nations regularly publishes the Gini coefficients of each country.

⁴The results are derived using the methodology defined in the previous sections.

⁵By 2028, 100% of the Russian population is estimated to be classified as middle class, which means that Russia would qualify as a developed country then. In our model, we assume that 100% of the population in developed countries is middle class.

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