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The Role of the Middle Class in Economic Development: What Do Cross-Country Data Show?

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Abstract

This paper investigates the channels through which the middle class may matter for consumption growth and development. Determinants of the size and the growth of the middle class are also examined. Using several different middle class measures and a panel of 72 developing countries spanning the period 1985–2006, we find that a larger middle class influences growth primarily through higher levels of human capital investment. We also find that large governments, higher levels of urbanization, greater democracy, ethnic concentration, and sea access are all associated with a larger middle class.

I. Introduction

Do countries with a larger "middle class" grow faster? A number of economists believe that the answer to this question is in the affirmative. For example, Kharas and Gertz (2010) compare the growth experience of Brazil and the Republic of Korea and suggest that the differential performance of the two countries can be explained by differences in the relative sizes of the middle class in the two economies.[1] Why should a larger middle class help foster growth? Banerjee and Duflo (2008) identify three arguments that are commonly made. The first argument is that the middle class is where entrepreneurs that foster innovation and growth emerge from. A second argument stresses middle class "values" that encourage accumulation of human capital and savings. A third argument suggests the consumption power of the middle class leads to diversification and expansion of markets, which allow for the exploitation of economies of scale in production (see Murphy, Shleifer, and Vishny 1989). In addition to these propositions, the middle class may play a key role in better governance. In comparison to the poor, the middle class may have the ability and power to demand better public service delivery and greater accountability from public officials, and support growth-oriented policies (Birdsall et al. 2000). These arguments suggest that the presence of a strong middle class in a country should have a significant positive influence on economic growth.

This paper seeks to examine the role of the middle class in consumption growth in a cross-country context. Starting with a structural growth model a la Mankiw, Romer, and Weil (1992) and a panel of 72 developing countries covering the period 1985–2006, we explore whether the middle class is of direct importance to consumption growth or has a more indirect effect on economic growth through its impact on factor inputs (i.e., human capital, savings, and labor force growth).[2] As we explain in more detail below, the measure of consumption growth used is growth in mean per capita consumption, which is a better reflection of the welfare of the population within a country compared to gross domestic product (GDP) per capita consumption. We also examine which policies and environmental factors are potentially conducive to middle class development by exploring the characteristics that influence the size and growth of the middle class.

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[1] Kharas and Gertz (2010) note that both Brazil and the Republic of Korea achieved middle-income status in the late 1970s and early 1980s. Brazil grew very rapidly from at least 1965 until 1980. By 1980, however, only around 29% of its population was considered to be middle class and, between 1980 and 1996, its economy stalled. In comparison, the Republic of Korea had 53% of its population considered as middle class in the early 1980s when it achieved middle-income status, and its economy continued to grow rapidly over the next decade until it had reached high-income status.

[2] Acemoglu, Johnson, and Robinson (2005, 388) cite North and Thomas's (1973, 2) argument that factor inputs are not the determinants of growth, they *are* growth (italics in original).

The analysis investigates the relationships using three different middle class definitions based on both absolute and relative measures of consumption expenditures. The absolute middle class measure, defined as the share of the population living on $2–$10 per person per day (in 2005 purchasing power parity [PPP] dollars), is similar to that in Banerjee and Duflo (2008). It assumes that those living on more than $2 per day have a base amount of consumption that can contribute economically to growth.[3] We also examine a relative measure where the middle class is defined as the share of households that have consumption expenditures between 75% to 125% of the median expenditures, as in Birdsall et al. (2000). This concept captures the idea that the middle class may be important not only for its consumption power, but also through its ability to form a political or economic action group that demands and implements policies that can contribute to market-oriented growth. It is related to the theories of the median voter whose support is often sought in the financing of productive public investments such as health or education. Finally, we examine a relative measure used by Easterly (2001), which is defined as the expenditure share held by the middle 60% of the expenditure spectrum. This measure is closely linked to the notion of expenditure inequality. To our knowledge, the use of such a diverse set of middle class measures to examine the means through which the middle class may have importance to economic growth in a cross-country context is unique.

We focus on developing countries for two reasons. First, the definition of middle class varies across developing and developed countries. Income groups defined as middle class in developing countries may belong to the poor class in developed countries. For instance, Ravallion (2009) argues that while people living on $2–$13 per day can be treated as middle class in developing countries, they would be treated as poor by US standards. Second, the growth path and factors that matter to growth in developed countries are expected to differ fundamentally from the growth path and factors influencing growth in developing economies. Including developed countries in the sample makes sense for growth studies that use data starting from the 1960s, or even the 1970s, but given the timeframe of the available middle class data, developed countries are likely to have already reached their steady states, making our growth model less applicable to them.

Our key finding is that the middle class does have a role to play in driving consumption growth and that their role works primarily through human capital accumulation. In particular, controlling for initial conditions and other factor inputs, we find a robust, positive, and significant relationship between the size of the middle class and economic growth through higher levels of schooling. This suggests a strong, indirect relationship between the middle class and growth. There is also evidence that the middle class contributes to higher levels of savings in a country, but savings is estimated to be an insignificant factor in our growth model.

[3] Chen and Ravallion (2010) find that those who are consuming $1.25 per person per day in 2005 PPPs are on the developing country poverty line, and represent the set of people who are truly poor and unable to provide for even their basic needs.

Our analysis also shows that the middle class is positively associated with higher levels of urbanization and better democracy, while a larger service sector, ethnic fractionalization, and landlocked countries are negatively related to the size of the middle class. Another significant finding is that the *size* of the government in an economy is positively related to the *size* of the middle class; however, *growth* in the government's size hurts the *growth* of the middle class. If one considers the size of the government sector as negatively associated with the size of the private sector, this finding suggests that growth in the size of the private sector helps the growth of the middle class. Some important results are also found with regard to legal systems. Specifically, the French and German legal traditions (compared to the British system) are negatively related to the size and the growth of the middle class, but the exact effect depends on the middle class measure used. Overall, there is evidence to suggest that the middle class is not a homogenous lot, and different segments of the middle class may possess different skills and capacities.

Our paper offers support for the belief that policies that factor in the welfare of the middle class and nurture their growth may be a more effective long-term strategy for alleviating poverty compared to policies focusing solely on the poor.[4] One reason such policies may be more effective is that growth that includes the middle class is likely to be more sustainable, given that more people across different racial and ethnic groups share in the growth process (Birdsall 2010). A politically and economically strong middle class is more likely to hold a government accountable, which would, in turn, ensure the rule of law, protection of property rights, and continued economic reform. Overall, the core strength of our study is to fill an important gap in the cross-country literature regarding the channels through which the middle class affects economic development and the determinants of its size and growth.

The remainder of our paper is organized as follows. Section II discusses the literature on the middle class. We specifically address the question of how aggregate country-level data can capture the linkages between the middle class and economic growth. Section III describes our econometric methodology, and Section IV describes the measures of middle class, and sample construction. Section V discusses the empirical findings, while Section VI presents robustness checks. Finally, Section VII concludes.

[4] To the extent that middle class growth channels are operative and significant, one can expect countries with a larger middle class to lead to not only faster economic growth, but also faster poverty reduction. This is one of Ravallion's (2009) findings, that countries growing faster also experience faster declines in poverty.

II. Related Literature

Income earners are typically classified into three categories: the poor, the middle class, and the rich. The cross-country literature on economic development has traditionally focused on the poor and on poverty (see, among others, Dollar and Kraay 2002, and Loayza and Raddatz 2010[5]), while the interest in the middle class and the rich has only intensified relatively recently (see, for example, Piketty and Saez 2006, in relation to the rich). Each of the categories has a particular link to economic performance, as captured by different theories. The disparity, that is, the inequality, between the groups have also been of long interest to researchers, both theoretically and empirically. A number of papers study the determinants of inequality (e.g., the famous Kuznets 1955 hypothesis), and inequality's impact on economic growth yielding mixed empirical evidence.[6] However, the evidence generally indicates that there is a strong relationship between inequality and income distribution within a country and a country's subsequent economic performance (Persson and Tabellini 1994) and human and physical capital investments (Galor and Zeira 1993, Galor and Moav 2004).

While the relationships between different groups within the income distribution are still of interest in the literature, one of the first cross-country studies focusing exclusively on the middle class is that of Easterly (2001). Easterly's work is based on the concept of a "middle-class consensus", which is defined as the coexistence of a higher share of middle income groups in the income distribution, and a lower degree of ethnic conflict in the society. Easterly argues that the lack of a middle class consensus leads to polarization in society, paving the way for a struggle over resource endowments and ultimately resulting in lower broad-based investments in human capital by the élite groups who hold the power. Easterly refers to 19th century England as having a middle class that facilitated industrialization through political harmony, and concludes that countries with middle class consensus grow faster.

More recently, Banerjee and Duflo (2008) have extended the interest in understanding the role of the middle class. Drawing upon the literature at large, Banerjee and Duflo identify several distinct arguments about why the middle class is important for growth. First, to the extent that entrepreneurs typically emerge from the middle class, they generate increases in productivity and employment for society (see also Acemoglu and Zilibotti 1997). Second, "middle class values" emphasize human capital accumulation and savings, both of which are key inputs into economic growth. Third, middle class people not only have the resources to consume more than the poor, but they are also willing to pay a little extra for quality. The demand generated by the middle class, thus, feeds into investment

[5] Loayza and Raddatz (2010) find that growth plays a significant and substantial role in poverty alleviation, and that composition of sectoral growth is an important determinant of how much poverty reduction occurs. On the other hand, Birdsall (2010) argues that the focus on the middle class has been limited because of the laser-like focus of the donor community on reducing absolute poverty.

[6] Some additional studies that explore the inequality–growth relationship are Perotti (1996), Barro (2000), Forbes (2000), Banerjee and Duflo (2003), and Voitchovsky (2005). Notably, Perotti (1996), among others, uses the share of middle quintile(s) in income distribution as the inequality measure.

in production and marketing, and raises economywide income levels, especially by allowing the exploitation of economies of scale in production (Murphy, Shleifer, and Vishny 1989).[7]

Using household surveys from 13 developing countries to distinguish between the different channels through which the middle class may promote growth, Banerjee and Duflo's analysis finds little support for the entrepreneurship channel. Instead, they argue that the single most important characteristic of the middle class is that they hold a steady job, and that the investment and consumption behavior supported by steady jobs is what may enable the middle class to play a key role in spurring growth.

Further arguments can also be advanced for the role of the middle class in economic growth. It has long been posited that the middle ranks of society emphasize the necessity for policy reform and democratic values. There is perceived to be an almost "natural" link between being middle class and a citizenship trait that supports good governance, elimination of corrupt and rent-seeking activities, public investment in health, education and infrastructure, openness, and modernization. The median-voter idea, as it applies to policy determination in the political economy literature, is most likely to be reliant on the middle class, a factor governments need to consider because of the defining power of this group over the policy outcomes. On the other hand, a stronger middle class is less likely to be associated with factions, civil conflict, and political instability. A stronger middle class should thus lead to a society with extended freedoms; and a political, social, and economic environment that promotes economic growth. Economic growth that is inclusive of a larger middle class is also more likely to be sustained, precluding possible collapses that would reverse the gains made.[8]

Increased focus on the middle class has recently resulted in suggestions to shift the policy orientation of some perennial development issues. For instance, middle class-centric approaches are suggested to have a greater impact in driving growth and reducing poverty than policies specifically aimed at the impoverished (Birdsall 2007 and 2010). In fact, using household survey per capita consumption growth models, Ravallion (2009) finds that the size of the middle class, measured in absolute terms, has an important connection to growth and poverty reduction.[9] With projections by Bussolo, De Hoyos, and

[7] People above poverty can demand a more diverse set of goods (above subsistence). They also have more resources to save and invest relative to the poor. Once they reach a critical size, they may be instrumental in generating both the demand as well as the resources required, for moving developing countries from traditional (low productivity/wages) to modern (high productivity/wages) production structures. A useful formalization of this basic insight is provided by Murphy, Shleifer, and Vishny (1989) who emphasize that as domestic markets become larger, increasing returns for production technologies that are unprofitable with smaller market size become profitable. Crucially, the emergence of a middle class is intimately related to an increase in domestic markets. According to Murphy, Shleifer, and Vishny (1989, 546), the middle class are natural consumers of manufactured goods.

[8] Hausman, Pritchett, and Rodrik (2005) find that countries experience growth accelerations followed by growth collapses, and show that economic reform is a significant predictor of sustained growth.

[9] Ravallion finds that initial inequality retards growth only if there is a high incidence of poverty, but has little implications for the nonpoor who are those consuming above $2 per day in 2005 PPP $s (i.e., the middle class).

Medvedev (2009); Kharas and Gertz (2010); and Kharas (2010), which project a large rise in middle class consumers over the next few decades, it is expected that the middle class will play an ever-increasing and relevant role in development planning.

This paper contributes to a small but growing body of literature on the role of the middle class in economic development. We adopt a structural growth model to examine the direct and indirect (i.e., factor input) effects associated with the size of the middle class, as measured in both absolute and relative terms. While we do not directly test any particular theory, our results shed significant light on some of the mechanisms mentioned above, and how important the middle class is for economic development. This study makes a significant contribution to the literature as no study to date has studied in detail how the middle class drives growth in developing countries and through which channels. We also investigate the economic and institutional factors that are potentially conducive to the growth of the middle class, and what factors are essential to foster its development.

III. Econometric Specification and Methodology

Our analysis of the relationship between consumption growth and the size of the middle class is based on a general empirical formulation of the augmented Solow growth model, where growth is determined by investment in human capital, savings, and labor force growth. This model is derived from a Cobb-Douglas production function $Y = AF(K,H,N)$, where Y is output, K is physical capital stock, H is human capital, N is labor force, and A captures total factor productivity (TFP) and other factors such as investment climate and institutional characteristics, among others. We follow the approach of Mankiw, Romer, and Weil (1992) and Islam (1995), who provide a basis for estimating specifications according to the Solow model using a panel of cross-country data, to examine whether after controlling for the key factor inputs the middle class has an added effect in the model.[10] We further examine whether the middle class may have an indirect impact on economic growth through its effects on factor inputs, that is, by driving investment in human capital, savings, and labor force growth.

Next, on the assumption that the middle class contribute importantly to economic growth, we examine which institutional and economic factors are potentially conducive to creating a larger middle class. This analysis provides insights on the ways to foster middle class

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The relationship between per capita income, wealth, and income distribution for a large set of countries is investigated by Solimano (2009). This study finds that growth is in favor of the lower middle class. However, as it relies on simple correlations, this study sheds little light on the mechanisms through which the middle class has an impact on an economy.

[10] One modification that we make to the Solow growth model is to use per capita consumption growth instead of output growth, in line with middle class measures available from household surveys. Likewise, savings replaces physical capital investment in the model.

development by examining both the levels and the growth of the middle class as a function of various country characteristics.

Our model regresses the dependent variables on lagged explanatory variables to better capture the actual contribution of these variables to the observed levels of outcomes, rather than simply capturing the correlations.

We first start with a growth model. As there are compelling findings in the literature on the nonlinear relationship between variables that capture the profile of the income distribution and economic growth (Banerjee and Duflo 2003, Chen 2003, Voitchovsky 2005), we include a quadratic term for the middle class in various formulations of our model. Specifically, we estimate growth models of the following form:

$$\frac{\Delta \ln C_{i,t}}{r} = \alpha + \beta \ln C_{i,t-r} + \lambda \ln H_{i,t-r} + \delta \ln S_{i,t-r} + \psi \ln N_{i,t-r} + \varphi_1 \ln MC_{i,t-r} + \varphi_2 \ln MC^2_{i,t-r} + \mu_i + \varepsilon_{i,t} \quad (1)$$

where variables vary by country *i,* at time, *t*, and *r* represents the number of years between the current household survey and the household survey just prior to the current household survey in our panel, *H* represents human capital, *S* savings, *N* labor force growth,[11] *MC* middle class measure*,* μ country fixed effects, and ε the error term. Since we are using an unbalanced panel, the dependent variable, $\Delta ln\ C/r$ represents the average log per capita yearly growth rate between time *t* and *t–r*. The logged specification, which follows from Mankiw, Romer, and Weil (1992), captures the move toward the steady state. Even though we estimate a structural growth model derived from formal theory, the fixed effects treatment limits the bias arising from omitted variables that are not captured by equation (1).

Our parameters of interest are φ_1 and φ_2, representing the direct effect of the middle class on growth. In the specifications where we use an absolute measure for the middle class, we also include as a further control the size of the upper class. This allows us to better differentiate between a story where the total magnitude of consumption expenditures leads to greater economic growth, versus one where the density or size of a particular consumption expenditure bracket (for example, middle class versus upper class) is what matters for economic growth.

To examine whether the middle class has an indirect effect on economic growth through factor inputs *I*, we estimate human capital, savings, or labor force growth equations using the following general form:[12]

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[11] This variable is actually $n + g + d$, where n is labor force growth rate, with $g + d$ being technology growth and depreciation rate, jointly capped at 0.07, as standard in the literature.

[12] From this point on, we choose to perform the regressions without logs, unless noted otherwise, since the nonlogged relationship more closely approximates the normal distribution curve than the logged version. The initial consumption variable is used in logs as part of the standard practice in the literature (logging such level variables also addresses the heteroskedasticity problem).

$$I_{i,t} = \eta + \gamma \ln C_{i,t-r} + \xi X_{i,t-r} + \zeta_1 MC_{i,t-r} + \zeta_2 MC^2_{i,t-r} + \mu_i + \upsilon_{i,t} \quad (2)$$

In addition to the middle class measures, we include a vector of controls, $X_{i,t-r}$ and log per capita consumption, all in lags. Specifically, the controls commonly used in our factor input models are urbanization, trade share in GDP, democracy, the share of services relative to agriculture in GDP, and the share of industry relative to agriculture in GDP. These variables capture important dimensions of the development process, as well as the factors that are important to factor accumulation within a country. For instance, it is generally accepted that urbanization, trade openness, political freedom, and sectoral growth are associated with considerable factor rewards such as higher wages, profits, and rents, leading to higher levels of factor inputs.[13] We also include additional controls that may cause significant variability in the observed levels of factor inputs. In particular, for human capital, proxied by the average level of schooling, we control for the share of public spending on education as a share of GDP. For savings, we include the number of assassinations and riots as measures of political instability, log population (to proxy for the size of the domesitic market), the share of population above 65, and the log price of investment. For labor force input, we include gender-specific measures of primary and secondary schooling (see Barro and Sala-i-Martin 2004).

To examine the factors that affect the size and the growth in the middle class, we use variants of the following specifications:

$$MC_{it} = \kappa + \theta \ln C_{i,t-r} + \varsigma Z_{i,t-r} + \mu_i + u_{it} \quad (3)$$

$$\Delta \ln MC_{it} = \vartheta + \chi \ln C_{i,t-r} + \rho \Delta \ln Z_{i,t-r} + \mu_i + \sigma_{it} \quad (4)$$

In these equations, $Z_{i,t-r}$ is a vector of variables generally argued to affect the size of the middle class, and includes urbanization, trade share in GDP, democracy, the share of services relative to agriculture in GDP, and the share of industry relative to agriculture in GDP, as well as log population, fertility, and government share in GDP. We include the population variable to proxy for the size of the domestic market, as in Murphy et al. (1989), as it can capture the extent to which middle class activities may be able to expand. Fertility is included as it is another important factor that is suggested to be related to middle class development. For example, Banerjee and Duflo (2008) find that the middle class tends to have fewer children. As more children imply greater health, education, and subsistence expenditures for families and, thus, fewer resources per person, fertility may serve as a major constraint to middle class development. Finally, government size can proxy the level of public investments that can support middle class activities (Birdsall et al. 2000). Nevertheless, too big a government can erode the economic freedom of the middle class through higher taxes and hamper its development.

[13] These effects can work jointly with, or independent of, the size of the middle class. This means the formulation in equation (2) captures the effects that are independent of the middle class. The relationship between these variables and the middle class is explored in the next formulation.

Many time-invariant country characteristics such as ethnic fractionalization, religion, and type of legal system, for instance, may also play significant roles in determining the size and growth of the middle class. The panel fixed effects treatment eliminates the time-invariant factors from the models, in which case it is not possible to explicitly identify which time-invariant factors matter. Following Acemoglu, Johnson, Robinson, and Yared's (2009) approach, we recover the fixed-effect coefficient for each country from equations (3) and (4), and subsequently find their relationships with several time-invariant country characteristics using the following regression specification:

$$\mu_i = a + bW_i + v_i \tag{5}$$

where W is a vector of time-invariant country characteristics including ethnic fractionalization, a landlocked dummy, the French legal system, the German legal system (the British legal system is the base),[14] the share of Protestant, Catholic, and Muslim people in the population (other religions is the base); regional dummies including Latin America, Sub-Saharan Africa, East Asia and the Pacific, the Middle East, and Eastern and Central Europe (South Asia is the base); and transition economies. Our interest in examining the role of ethnic fractionalization follows from Easterly (2001) who suggests that ethnic fractionalization can impede the growth of the middle class. In addition, the literature has shown that legal systems are the overarching structures determining several finance-related arrangements, such as lending and borrowing, as well as the state's attitude toward economic activity. For instance, the German legal system is strict but efficient in credit allocation, while the British legal system is more protective of investors and supports "unconditioned private contracts". Alternatively, the French legal tradition extends the power of the state into the markets, supporting "socially-conditioned private contracts" (see La Porta et al. 1998, 1999, 2008). We therefore consider whether these legal structures play any role in development of the middle class. Furthermore, different religions may prescribe different values and actions for economic undertakings which, ultimately, affect the size of the middle class. For example, the role of Protestantism is mentioned widely in the Weberian context. Finally, as regional factors and socialist heritage may affect the size of the different income classes in transition economies, they are included as further variables. These regressions provide important insights about the institutional and environmental factors that shape the size and growth of the middle class, which can help in understanding and forming more effective policy tools.

[14] La Porta et al. (2008) update their data, categorizing the former socialist countries into French or German legal systems.

IV. Data

Investigating the various channels through which the middle class has an impact on economic growth, and the factors that may influence its size and growth, entails using data from a variety of sources.

A. Measuring the Size of the Middle Class

Defining the group of individuals comprising the middle class is far from easy, and encompasses a complex set of characteristics related to occupations, educational levels, earnings, and values. For example, Merriam Webster defines the middle class as follows:

> a class occupying a position between the upper-class and the lower-class ... a fluid heterogeneous socioeconomic grouping composed principally of business and professional people, bureaucrats, and some farmers and skilled workers sharing common social characteristics and values.

Even if we restrict our attention to purely economic definitions based on income or expenditure, there is little consensus on how to define the middle class. Past studies have varied in using relative and absolute measures. Moreover, even within the class of absolute measures, there is little agreement on what the appropriate thresholds should be for differentiating between different classes. For example, Ravallion (2010) defines the middle class in developing countries as households with expenditures between $2 and $13 per person (in 2005 consumption PPP dollars). The lower cut-off of $2 represents the median value of the national poverty line from a sample of 70 developing countries, while the upper cut-off of $13 represents the US poverty line in 2005 PPPs. Ravallion argues that these bounds can be thought of as encompassing those who are not deemed poor by the standards of developing countries, but are still poor by the standards of rich countries. In contrast, Kharas and Gertz (2010)[15] use thresholds of $10 and $100 per person to define the middle class, while Milanovic and Yitzhaki (2002) define the middle class as those living between the mean incomes of Brazil and Italy, which is roughly between $10 to $20 per day in 2005 PPPs. This definition is also used by Bussolo et al. (2007) and Bussolo et al. (2009). Banerjee and Duflo (2008) base their analysis on a definition of the middle class as individuals living on $2 to $10 per day.

Still others rely on relative measures of middle class in an attempt to draw a closer connection between political consensus and inequality. A common approach is to define the middle class as those falling between 75% to 125% of the median income, as in Thurow (1987) for the United States and Birdsall et al. (2000) for developing countries. On the other hand, Easterly (2001) uses the expenditure/income share of the middle 60% as a measure of the middle class. Given there is a correlation of 0.90 between the middle

[15] Note that Kharas and Gertz (2010) substitute consumption levels obtained from household expenditure survey data with national accounts data.

60% of the income distribution with the Gini coefficient, this middle class measure is very similar to a measure of inequality.

We do not attempt to debate the merits of using different measures and cut-offs for the middle class, but argue that between absolute and relative measures there is reason to examine both in our analysis, as they relate to different reasons why the middle class is important for economic growth. Thus, we focus on three sets of middle class definitions: (i) an absolute measure, referred to as **MC ($2–$10),** representing the share of the population living on $2–$10 per day in 2005 PPP dollars; (ii) a relative measure, referred to as **MC middle 60%,** representing the share of the total consumption expenditure accruing to the middle 60% of the expenditure distribution; and (iii) a relative measure, **MC median**, representing the share of population that has expenditures at least above $2 per day and within 0.75%–1.25% of the median expenditure of the country.[16] When using MC ($2–$10), we include a measure for the upper class, **HC ($10+),** as a control and discuss the findings related to this class, where necessary.

The main data source for constructing the middle class measures at the country level is the World Bank's PovcalNet database (World Bank 2011a) of tabulated per capita consumption distribution and mean per capita consumption based on an extensive set of household surveys. The survey means are ultimately reported in 2005 PPP dollars.[17] The use of these data allows us to focus on per capita consumption growth that may better capture the actual welfare of individuals and the middle class's ability to play a role in the growth process, rather than the level of development as generally measured through national account GDP per capita consumption measures.

B. Sample Construction

The full set of countries is listed in the Appendix, with the sizes of the various groups according to each definition of middle class, in the first year of data available in our sample. We construct our sample by connecting our middle class measures with data from a variety of other sources. We use a measure of human capital as proxied by average years of schooling from Barro and Lee (2010), saving as percentage of GDP from the World Development Indicators (World Bank 2011b), and labor force growth based on Penn World Tables database 6.3 developed by the International Comparison Program. Summary statistics and originating sources for each of the variables used in our empirical specifications are provided in Table 1.

We create two different sets of data for our analysis. The first data set is an unbalanced panel—unbalanced purely due to survey availability in the relevant country—where the length of time between the two surveys can differ from year to year and from country to

[16] In actuality, we further specify that if the median income is below $2 per day then the middle class is captured as those falling between $2 and $2.25 per day.

[17] This allows constructing the entire distribution based on Lorenz curve parameterizations, as detailed in Datt (1998) and ADB (2009).

country. As it is based on actual household survey data, it provides expenditure growth rates without having to make strong assumptions regarding the trajectory of growth for nonsurvey years. The second data set is a balanced panel constructed to represent short-term growth rates in per capita consumption means using straight-line interpolation between survey data. The assumptions and the data underlying the construction of these middle class measures are further detailed in Chun (2010). This data set is used mainly as a robustness check. The unbalanced panel is the primary basis for the reported tables and subsequent discussion, as we expect this sample to more accurately capture the impact of the middle class on outcomes and factors affecting the size of the middle class.[18]

Table 1 presents the basic statistics of the variables used in our analysis based on the unbalanced panel. The average yearly growth of the log household per capita consumption, based on the household survey mean, is 1.6%. The minimum and maximum values of this variable, as well as its standard deviation, indicate a high degree of variance in the measure. Table 2 displays the correlations between the key variables in the unbalanced panel. The correlation between log change in per capita consumption mean and per capita consumption mean is negative (–0.21) as expected. On the other hand, MC ($2–$10) and the MC median measure are highly and positively correlated with each other (0.76). We can see that the different middle class measures are substantially different as the correlation between MC ($2–$10) and the MC middle 60% is only 0.14, while the correlation between the MC median and MC middle 60% is 0.48. All these point to a highly skewed consumption distribution, where the median income is probably among those who live on $2–$10, and the middle 60% has much higher consumption levels than those who live on $2–$10 and, to some extent, than those around the median income. This table also displays interesting features regarding the correlation between the middle class measures and the factor inputs. Schooling has high correlations with MC ($2–$10) and MC median (0.54 and 0.63, respectively), whereas its correlation with the MC middle 60% is only 0.27. The same pattern is observed with savings, but with lower levels of correlation. Labor force growth is negatively correlated with all middle class measures, with the correlation ranging between –0.20 and –0.41. In terms of the conjectured determinants of the middle class, correlations vary across a wide range, but MC middle 60% exhibits comparatively lower correlations with the trade, urbanization, sectoral shares and population. Finally, the correlation among the variables that are thought to determine the size of the middle class is not high, with the exception of fertility and agricultural value added (the latter is used in combination with industry, and services value added as the denominator), suggesting that the inclusion of most of these variables in the estimation process is capturing unique aspects of a country's institutional, economic, and cultural makeup and, thus, will not create issues in estimation due to multicollinearity.

[18] In both data sets, we utilize the period after 1985 because surveys for years prior to this date are sparse.

Table 1: Summary Statistics

Variables	Source	Mean	Max.	Min.	Sd.	Obs.
Unbalanced panel						
Ch Log HH Survey PC Cons Mean	1	0.016	0.394	-0.424	0.097	287
HH Survey Monthly PC Cons Mean	1	170.830	692.900	22.500	116.639	359
MC: HH Survey Pct $2–$10 Per Day 2005 PPPs	1	51.502	93.460	3.560	21.623	359
UC: HH Survey Pct $10–$20 Per Day 2005 PPPs	1	14.630	90.510	0.100	16.957	359
MC: Cons Share 20%–60% of Cons Dist	1	45.646	56.755	30.552	5.813	356
MC: HH Survey 0.75%–1.25% of Median Income	1	21.792	48.070	1.580	10.942	359
Average Years of Schooling	3	6.776	11.531	0.709	2.414	359
Gross Savings in GDP (%)	2	19.842	69.457	-31.119	11.556	359
Labor Force Growth	4	8.952	19.697	-7.248	2.219	354
Trade-to-GDP Ratio (%)	2	76.937	210.374	13.644	37.466	359
Share of Urban Population	2	0.501	0.926	0.067	0.198	359
Industry Share of GDP	2	0.312	0.623	0.107	0.091	359
Agriculture Share of GDP	2	0.178	0.618	0.009	0.123	359
Services Share of GDP	2	0.511	0.769	0.176	0.110	359
Democracy (higher values = better democracy)	5	5.528	10	0	3.584	352
Public Education Spending in GDP (%)	2	4.037	11.793	1.149	1.589	356
Number of Assassinations	6	0.238	15	0	1.124	341
Number of Riots	6	0.273	11	0	0.923	341
Total Population (scaled by 1000)	4	76798	1306314	1005	231870	359
Share of Population Above 65 (%)	2	6.354	17.009	1.991	3.945	359
Female Primary Schooling Enrollment (%)	2	96.831	149.917	21.194	19.914	342
Female Secondary Schooling Enrollment (%)	2	61.658	114.626	3.925	28.921	340
Male Primary Schooling Enrollment (%)	2	101.736	158.818	34.365	16.157	342
Male Secondary Schooling Enrollment (%)	2	62.323	107.222	5.974	25.372	340
Government Share in GDP (%)	4	20.044	55.655	4.687	8.299	359
Fertility Rate (per woman)	2	3.209	7.824	1.090	1.643	359
	Source	**Mean**	**Max.**	**Min.**	**Sd.**	**Obs.**
Cross Sectional						
Ethnic Fractionalization	7	0.459	0.965	0.004	0.312	72
Landlocked Country	8	0.222	1	0	0.419	72
Latin America and the Caribbean	9	0.278	1	0	0.451	72
Sub-Saharan Africa	9	0.111	1	0	0.316	72
East Asia and the Pacific	9	0.083	1	0	0.278	72
Middle East	9	0.236	1	0	0.428	72
Eastern Europe and Central Asia	9	0.236	1	0	0.428	72
Transition Economy	9	7.579	66	0	14.173	72
Share of Protestant Population (%)	10	31.181	96.6	0	37.880	72
Share of Catholic Population (%)	10	24.795	99.5	0	36.967	72
Share of Muslim Population (%)	10	0.431	1	0	0.499	72
French Legal System	11	0.597	1	0	0.494	72
German Legal System	11	0.125	1	0	0.333	72
British Legal System	11	0.278	1	0	0.451	72

Ch = change, Cons = consumption, GDP = gross domestic product, HH = household, , MC = middle class, PC = per capita, PPP = purchasing power parity, UC = upper class.

Sources: 1 - PovcalNet database (World Bank 2011a); 2 - World Development Indicators (World Bank 2011b); 3 - Barro and Lee (2010); 4 - Penn World Tables Mark 6.3; 5 - Polity IV Project by the Center for Systematic Peace; 6 - Banks (2008); 7 - Desmet et al. (2009); 8 - *CIA World Factbook* (Central Intelligence Agency 2010); 9 - Global Development Network Growth Database: Social and Fixed Factors (Easterly and Sewadeh 2003); 10 - La Porta et al. (1999); 11 - La Porta et al. (2008).

Table 2: Correlations Matrix

	LogCh PC Mean	PC Cons Mean	MC $2–$10)	Middle 60%	0.75%–1.25% of Median	Schooling	Savings	Labor Force	Trade GDP
Log Ch PC Cons Mean	1								
PC Cons Mean	-0.21	1							
MC ($2–$10)	-0.10	0.31	1						
Middle 60% (Easterly)	-0.09	0.00	0.13	1					
0.75%–1.25% around Median	-0.21	0.64	0.75	0.47	1				
Schooling	-0.02	0.50	0.53	0.26	0.62	1			
Savings	0.07	0.06	0.18	0.03	0.18	0.07	1		
Labor Force Growth	0.01	-0.19	-0.19	-0.38	-0.42	-0.43	-0.05	1	
Trade to GDP	0.02	0.18	0.22	0.08	0.21	0.41	0.10	-0.19	1
Urbanization	-0.04	0.63	0.59	-0.11	0.56	0.54	0.09	-0.13	0.08
Democracy	0.00	0.49	0.29	-0.12	0.30	0.42	-0.08	-0.20	0.17
Industry Share of GDP	-0.02	0.27	0.26	0.01	0.33	0.28	0.40	-0.15	0.04
Agr Share of GDP	0.00	-0.67	-0.56	0.15	-0.57	-0.51	-0.26	0.17	-0.22
Services Share of GDP	0.02	0.52	0.41	-0.18	0.37	0.34	-0.05	-0.07	0.21
Population	0.10	-0.21	-0.22	0.07	-0.18	-0.09	0.38	-0.04	-0.27
Govt. Share in GDP	-0.12	-0.08	0.05	0.25	0.10	0.07	-0.23	-0.12	0.14
Fertility Rate	-0.01	-0.54	-0.52	-0.28	-0.67	-0.78	-0.26	0.49	-0.24

	Urbanization	Democracy	Industry GDP	Agriculture GDP	Services GDP	Population	Govt GDP	Fertility	
Urbanization	1								
Democracy	0.42	1							
Industry Share of GDP	0.33	0.07	1						
Agr Share of GDP	-0.67	-0.50	-0.51	1					
Services Share of GDP	0.48	0.50	-0.26	-0.69	1				
Population	-0.18	-0.25	0.28	0.02	-0.26	1			
Govt. Share in GDP	-0.05	-0.07	-0.05	0.12	-0.10	0.03	1		
Fertility Rate	-0.55	-0.42	-0.44	0.61	-0.32	-0.15	0.03	1	

Agr = agriculture, Ch = change, Cons = consumption, GDP = gross domestic product, Govt = government, HH = household, , MC = middle class, PC = per capita, PPP = purchasing power parity, UC = upper class.

Source: Authors' estimates using data from Table 1.

V. Empirical Results

A. Does the Middle Class Have a Direct Effect on per Capita Consumption Growth?

Table 3 presents the results of our growth regressions. Consistent with the convergence hypothesis that countries with higher inital income grow more slowly, we find the expected negative sign for initial per capita consumption, which is highly significant across almost all specifications. Schooling is also positive and highly significant, reflecting the strong relationship between higher levels of human capital and consumption growth. While the savings variable is positively correlated with higher growth, it is statistically insignificant in all models. This is potentially due to the inability of the national accounts savings variable to sufficiently capture the relationship between savings and per capita consumption growth that is based on household survey data. Alternatively, it may simply reflect that in developing countries, savings is not efficiently converted into capital investment that leads to higher consumption growth. The coefficient on labor force growth, $n + g + d$, has a negative relationship with consumption growth, as predicted by the Solow model, but is insignificant in all specifications. The negative coefficient estimate captures the fact that, in the steady state, a rapidly growing labor force tends to slow down per capita consumption growth due to the need for a greater amount of resources to be dedicated to support the new entrants into the labor force. Given the amounts of physical capital and human capital available in the economy, higher labor force growth results in less resources per person. However, the insignificant coefficient estimate in all specifications suggests that, in developing countries, labor force growth is not a significant factor constraining per capita consumption growth.

After controlling for these primary inputs, we find that the coefficient estimate on the absolute measure of MC ($2–$10) is insignificant, indicating that there is no added effect on growth from a larger portion of the population having more than some threshold amount of consumption. On the other hand, we find that MC middle 60% has a nonlinear relationship with growth. Given the coefficient estimates we obtain, the effect of an increase in MC middle 60% on growth is always positive in our sample. Finally, the median measure as captured by those between 0.75%–1.25% of the median income is estimated to be insignificant.

Table 3: Growth Regressions—Linear and Nonlinear Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Linear Specification for MC**					
Initial Mean Consumption	-0.181***	-0.232***	-0.240***	-0.201***	-0.254***	-0.251***
	(-3.030)	(-8.441)	(-7.664)	(-3.209)	(-8.609)	(-7.514)
MC $2–$10 2005 PPP	-0.000390			-0.0268		
	(-0.0144)			(-0.971)		
MC $2–$10 2005 PPP Squared						
Upper Class $10+ 2005 PPP	-0.0217			-0.0211		
	(-0.955)			(-0.860)		
Upper Class $10+ 2005 PPP Squared						
Middle 60% Income Share (Easterly)		-0.0246			-0.0753	
		(-0.214)			(-0.609)	
Middle 60% Income Share (Easterly) Squared						
MC 75%–125% of the Median			0.0175			-0.000705
			(0.538)			(-0.0208)
MC 75%–125% of the Median Squared						
Average Years of Schooling				0.256***	0.249***	0.246***
				(4.083)	(4.021)	(3.975)
Savings				0.0184	0.0208	0.0208
				(1.020)	(1.163)	(1.165)
Labor Force Participation				-0.0226	-0.0202	-0.0205
				(-1.210)	(-1.080)	(-1.096)
Constant	0.965***	1.281**	1.157***	0.597*	1.009*	0.704***
	(3.298)	(2.555)	(7.674)	(1.919)	(1.872)	(3.659)
Observations	287	285	287	268	266	268
Adjusted R-squared	0.131	0.134	0.133	0.179	0.179	0.175
Number of countries	72	72	72	70	69	70

	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Nonlinear Specification for MC**					
Initial Mean Consumption	-0.156	-0.241***	-0.242***	-0.213*	-0.254***	-0.252***
	(-1.457)	(-8.899)	(-7.712)	(-1.894)	(-8.663)	(-7.511)
MC $2–$10 2005 PPP	0.216			0.171		
	(1.028)			(0.803)		
MC $2–$10 2005 PPP Squared	-0.0351			-0.0302		
	(-1.157)			(-0.977)		
Upper Class $10+ 2005 PPP	-0.0214			-0.0160		
	(-0.818)			(-0.560)		
Upper Class $10+ 2005 PPP Squared	-0.00438			-0.00134		
	(-0.613)			(-0.182)		
Middle 60% Income Share (Easterly)		12.18***			7.234*	
		(3.245)			(1.727)	
Middle 60% Income Share (Easterly) Squared		-1.623***			-0.972*	
		(-3.253)			(-1.746)	

continued.

Table 3: *continued.*

	(7)	(8)	(9)	(10)	(11)	(12)
Variables			**Nonlinear Specification for MC**			
			(1.215)			(0.480)
MC 75%–125% of the Median Squared			-0.0293			-0.0133
			(-1.118)			(-0.501)
Average Years of Schooling				0.255***	0.205***	0.242***
				(4.053)	(3.079)	(3.867)
Savings				0.0190	0.0225	0.0205
				(1.049)	(1.264)	(1.145)
Labor Force Participation				-0.0224	-0.0181	-0.0206
				(-1.198)	(-0.970)	(-1.100)
Constant	0.593	-21.57***	1.027***	0.372	-12.59	0.655***
	(1.395)	(-3.063)	(5.384)	(0.854)	(-1.613)	(3.026)
Observations	287	285	287	268	266	268
Adjusted R-squared	0.130	0.171	0.134	0.175	0.188	0.172
Number of countries	72	72	72	70	69	70

*** p<0.01, ** p<0.05, * p<0.1.
MC = middle class, PPP = purchasing power parity.
Note: t-statistics in parentheses. All variables in natural logs.
Source: Authors' estimates using data from Table 1.

It is possible to interpret the middle class in the growth regressions (i.e., the direct effect) as the TFP effect. The estimated growth model is derived from a Cobb-Douglas production function $Y = AF(K, H, N)$ where there are two sources of growth: (i) growth in factor inputs K, H, and N; and (ii) growth in TFP represented by A. This implies that holding factor inputs constant, any increase in Y will be due to an increase in TFP. Therefore, in our regression model, holding the factor inputs constant (and eliminating time-invariant country-specific effects), the middle class variable is likely to capture the effect associated with TFP. Given that the MC middle 60% variable was to have a positive and significant effect with consumption growth, this structural interpretation suggests that productivity could be higher when a greater share of total consumption is captured by the middle 60% of the consumption distribution.

B. Does the Middle Class Have an Effect on Factor Inputs?

While there is some evidence that the middle class has a direct effect on per capita consumption growth, it is possible that the middle class mainly affects economic growth indirectly through its impact on the levels of factor inputs. This subsection examines the relationship between middle class measures and human capital, savings, and labor force growth.

1. Human Capital

Table 4 displays the results from the regression of human capital on middle class and other controls. The absolute measure of MC ($2–$10) has a positive and linear effect

on schooling after including the controls. This indicates that having a base expenditure above subsistence is substantially important for accumulating human capital. The share held by the MC middle 60% has a significant nonlinear effect, where the effect is positive and increasing with middle class size, but at a decreasing rate. The middle class variable represented by those falling within 0.75%–1.25% of median expenditures after the inclusion of the controls has a positive and linear effect on average years of schooling. The significance of this measure lends credence to stories that the middle class is important to human capital accumulation by having policies implemented that support greater investment in schooling.

Table 4: Schooling Regressions—Linear and Nonlinear Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Linear Specification for MC**					
Initial Mean Consumption	0.633	0.519***	0.531***	-0.779**	0.113	-0.0194
	(1.097)	(2.994)	(2.813)	(-2.225)	(0.957)	(-0.153)
MC $2–$10 2005PPP (SM)	0.0118			0.0201***		
	(1.006)			(2.933)		
MC $2–$10 2005PPP (SM) Squared						
Upper Class $10+ 2005PPP (SM)	-0.00280			0.0317***		
	(-0.139)			(2.602)		
Upper Class $10+ 2005PPP (SM) Squared						
MC 60% Income Share (Easterly)		-0.00780			0.0244**	
		(-0.471)			(2.489)	
Middle 60% Income Share (Easterly) Squared						
MC 75% to 125% of the Median			0.000535			0.0168**
			(0.0418)			(2.198)
MC 75% to 125% of the Median Squared						
Trade-to-GDP Ratio				0.00258	0.00292*	0.00274
				(1.493)	(1.703)	(1.585)
Urbanization				14.66***	14.84***	14.52***
				(14.45)	(14.68)	(14.30)
Democracy Index				0.00356	0.00709	0.00662
				(0.252)	(0.506)	(0.470)
Industry/Agriculture Value Added				-0.145***	-0.150***	-0.149***
				(-4.145)	(-4.336)	(-4.271)
Services/Agriculture Value Added				0.115***	0.114***	0.118***
				(7.091)	(7.064)	(7.162)
Share of Public Education Expenditure in GDP				-0.0347	-0.0287	-0.0383
				(-1.004)	(-0.828)	(-1.101)
Constant	6.021***	8.003***	7.508***	5.746***	1.782**	3.294***
	(3.066)	(5.805)	(8.140)	(4.829)	(1.973)	(5.195)
Observations	287	285	287	280	278	280
Adjusted R-squared	0.942	0.939	0.939	0.980	0.980	0.980
Number of countries	72	72	72	71	70	70

continued.

Table 4: *continued.*

	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Nonlinear Specification for MC**					
Initial Mean Consumption	0.129	0.485***	0.378**	-0.651	0.100	-0.0377
	(0.188)	(2.993)	(2.028)	(-1.542)	(0.850)	(-0.288)
MC $2–$10 2005 PPP (SM)	0.0484**			0.0344**		
	(2.010)			(2.334)		
MC $2–$10 2005 PPP (SM) Squared	-0.000309*			-0.000147		
	(-1.707)			(-1.324)		
Upper Class $10+ 2005 PPP (SM)	0.00972			0.00910		
	(0.334)			(0.506)		
Upper Class $10+ 2005 PPP (SM) Squared	-1.57e-05			0.000273**		
	(-0.0812)			(2.155)		
MC 60% Income Share (Easterly)		0.793***			0.187*	
		(5.559)			(1.916)	
Middle 60% Income Share (Easterly) Squared		-0.00897***			-0.00184*	
		(-5.647)			(-1.675)	
MC 75%–125% of the Median			0.106***			0.0266
			(3.630)			(1.398)
MC 75%–125% of the Median Squared			-0.00227***			-0.000224
			(-3.988)			(-0.566)
Trade-to-GDP Ratio				0.00264	0.00249	0.00263
				(1.539)	(1.446)	(1.513)
Urbanization				14.61***	14.54***	14.50***
				(14.46)	(14.22)	(14.26)
Democracy Index				0.0133	0.00702	0.00570
				(0.914)	(0.504)	(0.401)
Industry/Agriculture Value Added				-0.164***	-0.134***	-0.145***
				(-4.546)	(-3.766)	(-4.090)
Services/Agriculture Value Added				0.121***	0.105***	0.115***
				(7.378)	(6.278)	(6.734)
Share of Public Education Expenditure in GDP				-0.0346	-0.0249	-0.0373
				(-1.000)	(-0.719)	(-1.070)
Constant	7.604***	-9.006***	7.500***	5.055***	-1.447	3.346***
	(3.248)	(-2.749)	(8.411)	(3.446)	(-0.680)	(5.214)
Observations	287	285	287	280	278	280
Adjusted R-squared	0.942	0.947	0.943	0.981	0.980	0.980
Number of countries	72	72	72	71	70	70

*** p<0.01, ** p<0.05, * p<0.1.
GDP = gross domestic product, MC = middle class, PPP = purchasing power parity.
Note: t-statistics in parentheses.
Source: Authors' estimates using data from Table 1.

The additional control variables reflect the importance of different country characteristics for schooling. A higher per capita consumption mean generally has a positive and significant impact on human capital. Greater urbanization and a higher share of value added of services relative to agriculture are also strongly and positively associated with human capital. Likewise, higher levels of trade openness are positively associated with schooling, but this variable is weakly significant. All these are intuitive findings, pointing to the factors relating to the incentives for human capital investment across countries. On the other hand, a higher share of industry value added in GDP relative to agriculture is negatively and significantly associated with human capital, which may reflect the greater industry development in developing countries to demand a larger number of low-skilled workers reducing incentives for additional years of schooling.

2. Savings

Table 5 displays the savings regressions. We find that the absolute measure of MC ($2–$10) is significant, positive, and has a nonlinear relationship with savings. This effect is increasing at a decreasing rate. This seems to indicate that having a base amount of consumption expenditure above subsistence is crucial to higher levels of savings. The MC median measure exhibits a nonlinear relationship with savings. However, for all practical purposes, the effect of this measure and savings is positive. The share held by the middle 60% has no significant relationship with savings. Our further explorations (unreported)

Table 5: Savings Regressions—Linear and Nonlinear Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
Variables			**Linear Specification for MC**			
Initial Mean Consumption	-3.144	-0.0437	-2.164	-5.912	-3.302*	-5.865***
	(-0.570)	(-0.0264)	(-1.225)	(-1.067)	(-1.827)	(-3.102)
MC $2–$10 2005 PPP (SM)	0.180			0.186*		
	(1.601)			(1.698)		
MC $2–$10 2005 PPP (SM) Squared						
Upper Class $10+ 2005 PPP (SM)	0.120			0.0805		
	(0.621)			(0.412)		
Upper Class $10+ 2005 PPP (SM) Squared						
Middle 60% Income Share (Easterly)		0.0171			0.126	
		(0.108)			(0.784)	
Middle 60% Income Share (Easterly) Squared						
MC 75%–125% of the Median			0.338***			0.392***
			(2.825)			(3.283)
MC 75%–125% of the Median Squared						
Trade-to-GDP Ratio				0.0855***	0.0931***	0.0911***
				(2.991)	(3.208)	(3.205)
Urbanization				16.87	27.12	19.82
				(0.696)	(1.083)	(0.822)
Democracy Index				-0.214	-0.113	-0.114
				(-0.897)	(-0.461)	(-0.482)
Industry/Agriculture Value Added				0.717	0.528	0.402
				(1.282)	(0.938)	(0.730)
Services/Agriculture Value Added				-0.0977	-0.134	-0.0105
				(-0.337)	(-0.456)	(-0.0363)
Number of Assassinations				0.154	-0.00835	0.215
				(0.359)	(-0.0187)	(0.502)
Number of Riots				0.220	0.297	0.207
				(0.555)	(0.729)	(0.526)
Log Population				-0.355	-3.194	-1.893
				(-0.0540)	(-0.473)	(-0.290)
Share of Population Above 65				-0.116	0.300	0.508
				(-0.143)	(0.369)	(0.637)
Log Price of Inv.				5.541***	5.184***	5.037***
				(3.446)	(3.165)	(3.169)
Constant	15.75	15.55	14.54*	0.169	12.80	9.418
	(0.839)	(1.184)	(1.685)	(0.00332)	(0.253)	(0.193)
Observations	287	285	287	279	277	279
Adjusted R-squared	0.723	0.715	0.725	0.752	0.743	0.754
Number of Countries	72	72	72	71	70	71

continued.

show that, controlling for all factors, all quintiles or groups of quintiles along the consumption spectrum are estimated to be insigificant in explaining savings,[1] implying that no quintile group drives the savings in developing countries. Overall, these results suggest that a minimum threshold level of consumption and a consensus for economic policies that promote the middle class are conducive to higher savings.

Table 5: *continued.*

	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Nonlinear Specification for MC**					
Initial Mean Consumption	-2.117	-0.129	-2.932	-6.856	-3.379*	-6.970***
	(-0.326)	(-0.0785)	(-1.637)	(-1.015)	(-1.862)	(-3.576)
MC $2–$10 2005 PPP (SM)	0.449*			0.522**		
	(1.959)			(2.236)		
MC $2–$10 2005 PPP (SM) Squared	-0.00266			-0.00319*		
	(-1.545)			(-1.810)		
Upper Class $10+ 2005 PPP (SM)	-0.165			-0.107		
	(-0.598)			(-0.355)		
Upper Class $10+ 2005 PPP (SM) Squared	0.00348*			0.00290		
	(1.887)			(1.335)		
Middle 60% Income Share (Easterly)		2.033			1.118	
		(1.401)			(0.693)	
Middle 60% Income Share (Easterly) Squared		-0.0226			-0.0113	
		(-1.398)			(-0.619)	
MC 75%–125% of the Median			0.868***			0.974***
			(3.098)			(3.196)
MC 75%–125% of the Median Squared			-0.0114**			-0.0133**
			(-2.088)			(-2.074)
Trade-to-GDP Ratio				0.0903***	0.0915***	0.0886***
				(3.168)	(3.131)	(3.140)
Urbanization				22.56	25.83	22.70
				(0.925)	(1.026)	(0.947)
Democracy Index				-0.0820	-0.106	-0.123
				(-0.333)	(-0.431)	(-0.525)
Industry/Agriculture Value Added				0.599	0.615	0.574
				(1.042)	(1.058)	(1.038)
Services/Agriculture Value Added				-0.0461	-0.170	-0.0788
				(-0.157)	(-0.565)	(-0.272)
Number of Assassinations				0.0904	-0.0304	0.226
				(0.211)	(-0.0676)	(0.530)
Number of Riots				0.198	0.294	0.168
				(0.500)	(0.719)	(0.429)
Log Population				-3.558	-3.300	-2.466
				(-0.526)	(-0.488)	(-0.380)
Share of Population Above 65				-0.148	0.221	0.00838
				(-0.182)	(0.269)	(0.0101)
Log Price of Inv.				5.098***	5.141***	5.087***
				(3.089)	(3.132)	(3.226)
Constant	8.894	-27.29	14.51*	25.30	-5.460	19.18
	(0.399)	(-0.819)	(1.694)	(0.485)	(-0.0931)	(0.394)
Observations	287	285	287	279	277	279
Adjusted R-squared	0.727	0.716	0.729	0.755	0.742	0.758
Number of Countries	72	72	72	71	70	71

*** p<0.01, ** p<0.05, * p<0.1.
GDP = gross domestic product, Inv = investment, MC = middle class, PC = per capita, PPP = purchasing power parity.
Note: t-statistics in parentheses.
Source: Authors' estimates using data from Table 1.

[1] This exploration included experimenting with different quintiles separately, as well as with bottom and upper 40%, bottom and upper 60%, bottom and upper 80%, under the linear and nonlinear specifications, and with and without controls.

The control variables in the savings regressions show a generally negative and insignificant effect of initial consumption mean on savings, with the negative sign consistent with predictions from convergence theory. That is, there are diminishing marginal returns to capital. Among other controls, trade openness and log price of investment are strongly and positively associated with savings, consistent with a huge body of literature that predicts that gains from international trade encourage increased savings for greater capital accumulation, while the investment price effect is likely reflective of a higher price of investment leading to higher returns to savings.

Table 6: Labor Force Regressions—Linear and Nonlinear Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Linear Specification for MC**					
Initial Mean Consumption	-3.508**	0.0541	-0.372	-2.580	0.160	-0.147
	(-2.038)	(0.106)	(-0.670)	(-1.311)	(0.258)	(-0.228)
MC $2–$10 2005 PPP (SM)	0.0720**			0.0742*		
	(2.054)			(1.968)		
MC $2–$10 2005 PPP (SM) Squared						
Upper Class $10+ 2005 PPP (SM)	0.127**			0.0996		
	(2.099)			(1.432)		
Upper Class $10+ 2005 PPP (SM) Squared						
Middle 60% Income Share (Easterly)		0.0643			0.0327	
		(1.315)			(0.601)	
Middle 60% Income Share (Easterly) Squared						
MC 75%–125% of the Median			0.0503			0.0466
			(1.338)			(1.135)
MC 75%–125% of the Median Squared						
Trade-to-GDP Ratio				-0.0100	-0.00857	-0.00880
				(-1.053)	(-0.890)	(-0.919)
Urbanization				-13.91*	-14.23*	-14.21*
				(-1.933)	(-1.949)	(-1.971)
Democracy Index				-0.108	-0.0956	-0.0916
				(-1.365)	(-1.190)	(-1.145)
Industry/Agriculture Value Added				-0.170	-0.170	-0.175
				(-0.847)	(-0.845)	(-0.883)
Services/Agriculture Value Added				0.0999	0.0876	0.0988
				(0.975)	(0.846)	(0.954)
Female Primary Schooling				0.0222	0.0273	0.0280
				(0.391)	(0.465)	(0.489)
Female Secondary Schooling				-0.0124	-0.00235	-0.0152
				(-0.174)	(-0.0330)	(-0.211)
Male Primary Schooling				0.00440	-0.00193	-0.00407
				(0.0715)	(-0.0306)	(-0.0655)
Male Secondary Schooling				0.0248	0.0153	0.0263
				(0.360)	(0.221)	(0.377)
Constant	19.28***	5.023	8.720***	18.06***	9.746*	11.51***
	(3.288)	(1.234)	(3.215)	(2.705)	(1.747)	(2.861)
Observations	287	285	287	266	264	266
Adjusted R-squared	0.446	0.443	0.441	0.463	0.455	0.457
Number of Countries	72	72	72	69	68	69

continued.

Table 6: *continued.*

	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Nonlinear Specification for MC**					
Initial Mean Consumption	-3.474*	0.101	0.0279	-1.943	0.269	0.355
	(-1.707)	(0.200)	(0.0505)	(-0.817)	(0.435)	(0.541)
MC $2–$10 2005 PPP (SM)	-0.00674			-0.0786		
	(-0.0937)			(-0.931)		
MC $2–$10 2005 PPP (SM) Squared	0.000751			0.00138**		
	(1.389)			(2.186)		
Upper Class $10+ 2005 PPP (SM)	0.184**			0.170*		
	(2.114)			(1.683)		
Upper Class $10+ 2005 PPP (SM) Squared	-0.000763			-0.00125*		
	(-1.319)			(-1.759)		
Middle 60% Income Share (Easterly)		-1.039**			-0.963*	
		(-2.335)			(-1.716)	
Middle 60% Income Share (Easterly) Squared		0.0124**			0.0113*	
		(2.494)			(1.783)	
MC 75%–125% of the Median			-0.226***			-0.235**
			(-2.610)			(-2.274)
MC 75%–125% of the Median Squared			0.00595***			0.0064***
			(3.524)			(2.956)
Trade-to-GDP Ratio				-0.0116	-0.00575	-0.00621
				(-1.232)	(-0.593)	(-0.659)
Urbanization				-13.05*	-12.90*	-13.37*
				(-1.812)	(-1.768)	(-1.892)
Democracy Index				-0.158*	-0.0962	-0.0900
				(-1.922)	(-1.204)	(-1.149)
Industry/Agriculture Value Added				-0.122	-0.244	-0.290
				(-0.595)	(-1.198)	(-1.463)
Services/Agriculture Value Added				0.109	0.129	0.172*
				(1.053)	(1.224)	(1.647)
Female Primary Schooling				0.0575	0.0512	0.0301
				(0.994)	(0.857)	(0.536)
Female Secondary Schooling				-0.00699	-0.0121	0.00479
				(-0.0990)	(-0.170)	(0.0674)
Male Primary Schooling				-0.0289	-0.0272	-0.00135
				(-0.462)	(-0.421)	(-0.0222)
Male Secondary Schooling				0.0120	0.0230	0.00635
				(0.176)	(0.333)	(0.0924)
Constant	19.97***	28.47***	8.740***	17.80**	29.81**	9.632**
	(2.859)	(2.785)	(3.308)	(2.186)	(2.376)	(2.412)
Observations	287	285	287	266	264	266
Adjusted R-squared	0.449	0.456	0.470	0.477	0.461	0.478
Number of Countries	72	72	72	69	68	69

*** p<0.01, ** p<0.05, * p<0.1.
GDP = gross domestic product, MC = middle class, PPP = purchasing power parity.
Note: t-statistics in parentheses.
Source: Authors' estimates.

3. Labor Force Growth

Table 6 shows that all middle class measures are significantly related to labor force growth after including the controls. However, our absolute measure MC ($2–$10) is positively and linearly related, while the relative measures MC middle 60% and MC median are negatively and nonlinearly associated with labor force growth. Positive (negative) sign implies that growth of labor force participation is increasing (decreasing) in the size of the middle class in developing countries. These contrasting signs are interesting. Based on the Solow model, this suggests that the costs required to endow the labor force with more resources are lower for those who live on $2–$10 per day and

facilitate higher growth in labor force participation, while for those who hold the middle 60% and those who are around the median in the expenditure spectrum have higher costs, which decrease over the range of reasonable values, suggesting a lower growth rate in labor force. The factor underlying these signs could be the skill levels associated with each group. That is, those who are just above the subsistence consumption level are likely to hold more basic skills, which are less expensive to augment and which can operate with the existing factor inputs with no extra training. Others hold more specific skills so that they need to bear more costs for training that will enable them to use the factor inputs associated with their specific skills. Differential skill levels would also indicate that the MC measures capture different parts of the expenditure spectrum. Further, given all these, our results might also point to differential skill levels corresponding to a life that is just above subsistence consumption versus ability to organize around a consensus, which would, in turn, be able to attract concessions from the government for greater group welfare.[19]

The inclusion of the various other controls shows that the sign on the initial consumption mean is not consistent across the MC measures, nor is it significant. Among the controls, only urbanization is significant but with a negative sign. This can again be explained with specificity of the skills associated with economic activities and sectoral diversity in the urban sector, and the concurrent costs of improving the skills. No other control variables are significant in explaining the labor force growth in developing countries.[20]

Table 7 summarizes the middle class–related results. We find some evidence that the middle class influences directly per capita consumption growth; however, we find stronger evidence that a larger middle class is associated with greater factor accumulation in terms of higher levels of schooling and savings. The middle class contribution to the labor force seems to depend on the skill levels captured by the measure. Given that human capital is the only input factor that has a robust, positive, and significant relationship with consumption growth, we conclude that it is mainly through this channel that the middle class has an impact on consumption growth. This also suggests that the following aspects, namely, a larger portion of the population having a minimum threshold level of consumption, represented by our absolute measure; a more equal distribution of consumption across the population as captured by the middle 60% measure; and having political and social consensus for policies supportive of the middle class, represented by the relative median measure, are all important as to why the middle class matters to human capital investment and subsequent consumption growth.

[19] It should be noted that had the negative relationship between labor force growth and per capita consumption growth been significant in the estimates of equation (1), a larger middle class could have potentially been growth-enhancing through lower labor force growth.

[20] In fact, higher levels of trade openness, greater democracy, and a higher industry share relative to agriculture all have negative signs but their significance levels are just outside the conventional limits. All these signs are consistent with the skill specificity and cost explanation for respective variables.

Table 7: Summary of Robust Effects (after controls)

	Growth	Schooling	Savings	Labor Force
Middle Class ($2–$10)	None	Linear positive	Nonlinear positive: increasing at a decreasing rate	Linear positive
Upper Class ($10+)	None	Linear positive	None	Nonlinear positive: increasing at a decreasing rate
Middle 60% (Easterly)	Nonlinear positive: increasing at a decreasing rate	Nonlinear positive: increasing at a decreasing rate	None	Nonlinear negative: decreasing at a decreasing rate
0.75%–1.25% Around Median	None	Linear positive	Nonlinear positive: increasing at a decreasing rate	Nonlinear negative: decreasing at a decreasing rate

Source: Authors' estimates.

C. What Factors Affect the Size of the Middle Class?

We now examine what factors can contribute to a larger middle class and what factors contribute to its growth. In our preliminary analysis, we find that initial consumption mean has a nonlinear relationship with the size of the middle class, and therefore, we include a quadratic term for initial consumption in our formulation.

1. Absolute Measure—MC $2–$10

Table 8a presents factors that are robustly associated with a larger middle class. Initial consumption mean is positively related with the absolute measure with an effect that increases at a decreasing rate. Further, higher levels of urbanization, a more democratic government, and higher government share in GDP are all associated with a larger middle class (Models 1 and 2). This is consistent with findings that urban centers offer considerable positive spillovers and allow particular sectoral growth and production to take place, resulting in stable employment productivity (Ellison, Glaeser, and Kerr 2007). Also, democratic regimes are associated with increased civil liberties, rule of law, as well as greater political stability. Given that the middle class captured by this definition is likely to be involved with relatively small economic activities, making them vulnerable to shocks and volatility, a stable political environment seems to provide the basic conditions for a larger middle class size. A big government is associated with a larger middle class, consistent greater provision of public investments such as health and education, and steady jobs and earnings that state-owned enterprises provide (Birdsall et al. 2000). By contrast, a higher share of services relative to agriculture is estimated to be negatively associated with the size of the middle class. Our further regressions (unreported) show that services share relative to agriculture is related to a larger upper class (those who live on $10+ per day). Finally, fertility is negatively associated with the size of the middle class, but is not statistically significant.[21]

[21] Fertility is negative and significant when the quadratic term of the initial consumption mean is not included in the model. This seems to suggest that higher fertility becomes detrimental for the middle class at higher levels

Table 8a: Determinants of the Size of the Middle Class

	(1)	(2)	(3)	(4)	(5)	(6)
	MC ($2–$10)		Middle 60%		0.75%–1.125% around Median	
Log Initial Mean Cons.	97.93***	90.34***	-8.811*	-9.907**	13.15*	12.30
	(5.570)	(4.995)	(-1.817)	(-2.003)	(1.719)	(1.550)
Log Initial Mean Cons. Squared	-10.19***	-9.418***	0.960**	1.055**	-1.073	-0.980
	(-5.798)	(-5.196)	(1.982)	(2.129)	(-1.403)	(-1.232)
Trade-to-GDP Ratio	-0.00161	-0.000618	-0.000597	0.00381	0.0112	0.0106
	(-0.0437)	(-0.0164)	(-0.0588)	(0.369)	(0.698)	(0.641)
Urbanization	59.64***	62.41**	3.053	11.22	18.57**	20.94
	(2.769)	(2.024)	(0.514)	(1.330)	(1.982)	(1.548)
Democracy Index	1.519***	1.459***	0.0448	0.0571	0.216*	0.209
	(5.120)	(4.812)	(0.548)	(0.689)	(1.675)	(1.572)
Services/Agriculture Value Added	-0.698**	-0.748**	-0.167*	-0.146	-0.492***	-0.507***
	(-2.059)	(-2.143)	(-1.784)	(-1.531)	(-3.333)	(-3.310)
Industry/Agriculture Value Added	0.229	0.567	0.250	0.348*	0.400	0.452
	(0.313)	(0.746)	(1.237)	(1.676)	(1.256)	(1.355)
Log Population		-6.631		-1.207		-2.381
		(-0.608)		(-0.404)		(-0.498)
Fertility Rate		-1.649		0.470		-0.406
		(-0.737)		(0.768)		(-0.414)
Government Size		0.307*		0.0981**		0.0218
		(1.795)		(2.098)		(0.291)
Constant	-212.1***	-132.6	63.56***	69.77**	-26.08	-1.499
	(-4.920)	(-1.146)	(5.345)	(2.208)	(-1.390)	(-0.0295)
Observations	281	281	279	279	281	281
Number of Countries	71	71	70	70	71	71

*** p<0.01, ** p<0.05, * p<0.1.
Cons = consumption, GDP = gross domestic product, MC = middle class.
Note: t-statistics in parentheses.
Source: Authors' estimates.

The time-invariant country characteristics offer additional insights on the determinants of the MC ($2–$10), as seen in Table 8b (Models 1 and 2). Lower levels of ethnic diversity (as captured by a measure developed by Desmet, Ortuno-Ortin, and Wacziarg 2009) are associated with a larger middle class. This is consistent with the theory and findings of Easterly (2001). In fact, our finding suggests that the coexistence of the middle class and ethnic concentration is not a random outcome, but that the latter shapes the former, helping the formation of political consensus in the Easterly (2001) sense. On the other hand, countries that are based on the German legal system and, to some extent, the French legal structure are at a disadvantage in terms of the size of the middle class.

of development. On another note, log population, which proxies the size of domestic markets, is positive and significant when fertility and urbanization are removed from the model. This suggests that urban areas and bigger families already provide the middle class with larger domestic markets, so that the explanatory power of the proxy is washed out if the relevant variables are included in the model.

German legal tradition, characterized by strict credit policies, may be denying this group access to sufficient credit opportunities.[22] In addition, La Porta et al. (1999) establish that the French legal heritage is associated with lower public employment, lower infrastructure quality, higher top tax rates, less secure property rights, and worse regulation. Thus, these factors seem to be hampering middle class activities. Landlocked countries have a smaller middle class as these countries tend to lack the benefits of sea access and suffer from geographical disadvantages such as mountainous terrain, big steppes, and desert plains.[23] After taking into account time-varying economic indicators and other time-invariant country characteristics, landlocked countries have, on average, a 19% smaller absolute middle class than countries with sea access. Also, a larger Catholic population seems to be associated with a lower proportion of the population living on $2–$10.

2. Relative Measure—MC Middle 60%

The factors contributing to a larger share of expenditures held by the MC middle 60% are shown in Table 8a (Models 3 and 4). In terms of economic indicators, only initial consumption mean, the GDP share of industry relative to agriculture, and government size seem to matter for the MC middle 60%. Initial consumption is negatively related with the share of MC middle 60%, but the effect is declining at a decreasing rate. Given that MC middle 60% is close to the notion of equality in the society, this result points out to a Kuznets (1955)-type nonlinear relationship between the level of development and inequality. Further, a larger share of industry GDP relative to agriculture leads to a larger share of MC middle 60%. This is consistent with the notion that industry creates relatively better employment and earning opportunities for people in the middle class. As found above, a big government provision seems to suggest a large middle class size.

The effects of time-invariant country characteristics on the size of the middle 60% are displayed in Table 8b (Models 3 and 4). We find some evidence that regional characteristics matter. Latin America and Sub-Saharan Africa have a significantly lower share of the MC middle 60% that is unexplained by other country characteristics and economic indicators, in comparison to South Asia. Again, given the relationship between MC middle 60% and equality, a lower share in Latin America and Sub-Saharan Africa is not surprising. Other regions appear to be no different from South Asia. Finally, the negative impact of being landlocked emerges as a significant factor influencing the size of the middle class.

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[22] In line with La Porta et al. (2008), countries with a German legal system in our sample are Bulgaria, Estonia, Latvia, Mongolia, Poland, and Slovenia, which constitute 11% of our sample. Because we hold the "transition" effect constant in the models, the legal system effect found here should not be driven by former socialist heritage. In fact, a number of former socialist countries now follow the French legal tradition.

[23] Landlocked countries in our sample include mountainous countries such as Armenia, Bolivia, Nepal, and the Kyrgyz Republic; countries located on large steppes, such as Kazakhstan and Mongolia; and some African countries with desert plains and sand dunes.

Table 8b: Relationship between Middle Class Size and Time-Invariant Country Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Fixed Effects Coefficients from the Corresponding Models Above					
Ethnic Fractionalization	6.270	15.20**	2.498	3.622	1.421	4.608*
	(1.139)	(2.384)	(1.261)	(1.563)	(0.571)	(1.771)
Latin America and the Caribbean	31.17***	12.64	-3.483	-7.986**	4.993	-1.450
	(3.692)	(1.293)	(-1.136)	(-2.226)	(1.308)	(-0.363)
Sub-Saharan Africa	9.758	-3.881	-2.946	-6.688**	0.706	-4.123
	(1.508)	(-0.518)	(-1.209)	(-2.345)	(0.241)	(-1.348)
East Asia and the Pacific	17.82**	10.81	-0.595	-1.945	1.100	-1.642
	(2.450)	(1.283)	(-0.216)	(-0.602)	(0.334)	(-0.478)
Middle East	36.87***	21.38**	-0.904	-4.976	16.26***	11.31***
	(4.490)	(2.249)	(-0.304)	(-1.430)	(4.378)	(2.913)
Eastern Europe and Central Asia	24.69**	0.405	0.978	-4.699	13.03***	4.323
	(2.384)	(0.0338)	(0.264)	(-1.082)	(2.781)	(0.883)
Share of Protestant Population	-0.104	-0.203	-0.0218	-0.0514	-0.0780	-0.124**
	(-0.829)	(-1.396)	(-0.491)	(-0.986)	(-1.371)	(-2.089)
Share of Catholic Population	-0.219***	-0.182**	-0.0286	-0.0303	-0.0471	-0.0392
	(-3.245)	(-2.323)	(-1.194)	(-1.082)	(-1.539)	(-1.227)
Share of Muslim Population	-0.0421	-0.0240	0.0210	0.0163	-0.0552*	-0.0530*
	(-0.691)	(-0.340)	(0.958)	(0.633)	(-2.002)	(-1.839)
Landlocked	-5.611*	-11.80***	-1.762	-2.803**	-5.358***	-7.291***
	(-1.735)	(-3.150)	(-1.538)	(-2.090)	(-3.664)	(-4.770)
French Legal System	-10.25**	-7.515	-0.117	-0.563	-3.762*	-3.193
	(-2.381)	(-1.508)	(-0.0768)	(-0.317)	(-1.932)	(-1.570)
German Legal System	-18.27***	-21.63***	2.506	0.990	-0.877	-2.016
	(-2.937)	(-3.003)	(1.140)	(0.385)	(-0.312)	(-0.686)
Transition Economy	3.121	8.144	3.459	5.205	0.390	2.960
	(0.351)	(0.790)	(1.099)	(1.413)	(0.0969)	(0.704)
Constant	-5.811	3.274	0.0334	4.049	-0.141	3.407
	(-0.911)	(0.443)	(0.0139)	(1.438)	(-0.0490)	(1.130)
Observations	71	71	70	70	71	71
Adjusted R-squared	0.416	0.457	0.531	0.515	0.595	0.584

*** p<0.01, ** p<0.05, * p<0.1.
Note: t-statistics in parentheses.
Source: Authors' estimates.

3. Relative Measure—0.75%–1.25% of the Median Consumption

The factors that contribute to a larger proportion of the population within 0.75%–1.25% of median consumption are shown in Table 8a (Models 5 and 6). Initial per capita consumption is positively associated with this measure of the middle class.[24] In addition,

[24] Removing the quadratic term of the initial consumption mean makes the relationship significant and positive.

a greater share of services relative to agriculture is associated with a smaller middle class. Our further regressions (unreported) show that services share is positively related to the size of the lower group, that is, those who are below the 75% of the median consumption.[25] Given that services had a positive impact on the richer class, our results suggest that possible employment opportunities created by the services sector have a different impact on different classes. These results are not suprising, given that Birdsall et al. (2000) find that during the globalization process, parts of the middle class based on this median measure experienced increased upward mobility, while others experienced increased uncertainty and downward mobility. Overall, these findings suggest that the services sector is associated with different occupational categories and, correspondingly, differential skills and rewards. We also find that the impact of democratic government and urbanization on MC median is generally positive but the significance levels of these variables is just outside the 10% level.

Time-invariant country characteristics associated with MC median are examined in Table 8b (Models 5 and 6). Ethnic concentration is again significant and positively related to a larger middle class. Landlocked countries are associated with a smaller relative middle class, while larger Muslim and Protestant populations are associated with a smaller share of people within 0.75%–1.25% of the median income. The Middle Eastern regional characteristics seem to be associated with a much larger share of middle class, compared to South Asia, which is no different from other regions.

To sum up, our results provide significant insights regarding the factors that are associated with middle class size. In general, greater government involvement in the economy, a lower services share relative to agriculture, higher urbanization levels, and a democratic regime are associated with a larger middle class. Countries with greater ethnic diversity and those that are landlocked are at a disadvantage in creating a larger middle class, whether defined with an absolute or a relative measure. The German legal system and, to some extent, the French law seem to be negatively associated with middle class size as well. There is also evidence to suggest that, after controlling for several factors, regional characteristics and some religions may affect the size of the middle class. Overall, our time-invariant factors are able to explain 42%–60% of country-fixed characteristics that affect the middle class.

D. What Factors Affect the Growth of the Middle Class?

In comparison to the *size* of the middle class, exploring the *growth* in its size can offer insights on the steps that can be taken to expand its size. Table 9a presents the regression results where the growth in middle class size is modeled as a function of the *growth* of various explanatory variables. Due to the need to use lagged growth of

[25] Perhaps expectedly, both industry and services share relative to agriculture are insignificant for the upper group, i.e., those above 125% of the median consumption, implying that the sectoral employment opportunities do not explain the size of this group.

the explanatory variables to overcome the reverse causation problem, in this analysis we utilize the balanced panel data to keep the number of countries comparable to the analysis of the size of the middle class. The results show that initial consumption is nonlinearly negative and significant for the absolute measure, as well as for the median measure, indicating a "middle class convergence" effect. In other words, developing countries seem to experience a (conditional) convergence to a certain level of middle class size, but at a slower rate over the range of middle class values. On the other hand, in contrast to the middle class size regressions, *growth* in the government's share in GDP is associated with decreases in middle class size using MC ($2–$10) and MC middle 60% measures. This result is consistent with the explanation that an expansion in government size erodes the economic freedom of its population by taxing people, and/or extending the public sector's arm at the expense of the middle class. The picture becomes clearer if one defines the private sector as "1- public sector". To the extent that larger governments imply smaller private sectors, our finding suggests that smaller *sizes* of private sectors are associated with smaller middle class *sizes*, but *growth* in the size of the private sector can pave the way for the *growth* in the middle class size. Also significant is the growth in

Table 9a: Determinants of Growth of the Middle Class

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**MC ($2–$10)**		**Middle 60%**		**0.75%–1.125% around Median**	
Log Initial Mean Cons.	-0.504***	-0.702***	-0.0460	-0.0491	-0.512***	-0.679***
	(-2.925)	(-3.872)	(-1.597)	(-1.517)	(-2.783)	(-3.468)
Log Initial Mean Cons. Squared	0.0514***	0.0702***	0.00440	0.00474	0.0493**	0.0651***
	(2.773)	(3.604)	(1.419)	(1.365)	(2.487)	(3.099)
Trade-to-GDP Ratio	-0.0126	-0.0321	0.0226	0.0217	-0.0578	-0.0491
	(-0.122)	(-0.302)	(1.305)	(1.141)	(-0.524)	(-0.428)
Urbanization	-1.917	-1.258	0.0381	-0.0177	-1.880	-1.263
	(-1.119)	(-0.753)	(0.133)	(-0.0594)	(-1.027)	(-0.701)
Democracy Index	-0.0229	-0.00922	-0.00892***	-0.00926***	-0.0235	-0.0121
	(-1.150)	(-0.479)	(-2.686)	(-2.704)	(-1.102)	(-0.584)
Services/Agriculture Value Added	0.0303	0.183*	0.0123	0.0269	-0.0264	0.117
	(0.417)	(1.786)	(1.013)	(1.481)	(-0.339)	(1.065)
Industry/Agriculture Value Added	0.0594	-0.0885	0.00390	-0.00982	0.0945	-0.0314
	(0.670)	(-0.838)	(0.264)	(-0.522)	(0.998)	(-0.276)
Log Population		0.753		0.0582		0.960
		(0.777)		(0.338)		(0.918)
Fertility Rate		-0.0982		-0.0679		0.273
		(-0.252)		(-0.972)		(0.649)
Government Size		-0.192*		-0.00607		-0.269**
		(-1.704)		(-0.302)		(-2.213)
Constant	1.230***	1.709***	0.116*	0.121	1.321***	1.718***
	(3.114)	(4.073)	(1.748)	(1.610)	(3.128)	(3.796)
Observations	313	305	311	303	313	305
Number of Countries	70	70	70	70	70	70

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

Cons = consumption, GDP = gross domestic product, MC = middle class.

Note: t-statistics in parentheses. All explanatory variables (except Log Initial Consumption Mean) are lagged growth of the relevant variables using balanced panel data.

Source: Authors' estimates.

democracy in explaining the growth in MC middle 60%. Interestingly, the sign is negative. Improving the level of democracy in developing countries is a significant investment which requires substantial resources. The negative sign probably means that those resources are used at the expense of middle class growth.[26] Further, growth in services share relative to agriculture is associated with a higher growth of middle class based on the absolute measure.

Table 9b: Relationship between Middle Class Growth and Time-Invariant Country Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Dependent Variable: Fixed Effects Coefficients from the Corresponding Models Above**					
Ethnic Fractionalization	-0.0263	-0.0226	-0.000825	-0.000315	-0.0270	-0.0301
	(-1.023)	(-0.909)	(-0.111)	(-0.0425)	(-1.096)	(-1.172)
Latin America and the Caribbean	0.0223	0.0681	0.00880	0.00978	0.0634	0.0924**
	(0.515)	(1.620)	(0.701)	(0.781)	(1.522)	(2.130)
Sub-Saharan Africa	0.0348	0.0393	0.0121	0.0134	0.0412	0.0385
	(1.055)	(1.228)	(1.270)	(1.401)	(1.298)	(1.165)
East Asia and the Pacific	0.0901**	0.0984***	0.0105	0.0109	0.121***	0.120***
	(2.517)	(2.837)	(1.013)	(1.056)	(3.518)	(3.348)
Middle East	0.0291	0.0895**	0.00985	0.00998	0.0752*	0.126***
	(0.723)	(2.296)	(0.847)	(0.859)	(1.947)	(3.127)
Eastern Europe and Central Asia	-0.00326	0.0622	0.0126	0.0127	0.0645	0.118**
	(-0.0645)	(1.269)	(0.864)	(0.868)	(1.329)	(2.341)
Share of Protestant Pop.	-7.57e-05	-0.000444	0.000161	0.000141	0.000125	-0.000159
	(-0.0977)	(-0.591)	(0.719)	(0.631)	(0.169)	(-0.206)
Share of Catholic Pop.	8.02e-06	-0.000201	-2.94e-05	-4.92e-05	0.000235	2.48e-05
	(0.0229)	(-0.592)	(-0.290)	(-0.486)	(0.697)	(0.0706)
Share of Muslim Pop.	0.000375	-3.03e-05	4.23e-05	2.71e-05	0.000288	-0.000134
	(1.248)	(-0.104)	(0.487)	(0.313)	(1.000)	(-0.445)
Landlocked	0.00800	-0.0204	-0.0117**	-0.0120***	-0.00617	-0.0355**
	(0.519)	(-1.368)	(-2.621)	(-2.689)	(-0.417)	(-2.303)
French Legal System	-0.0137	-0.0285	-0.000550	-0.000211	-0.0239	-0.0349
	(-0.601)	(-1.297)	(-0.0837)	(-0.0323)	(-1.097)	(-1.537)
German Legal System	-0.00863	-0.00931	0.00486	0.00439	-0.0249	-0.0176
	(-0.254)	(-0.283)	(0.496)	(0.449)	(-0.764)	(-0.518)
Transition Economy	0.0299	0.00298	0.000224	0.00110	0.0289	-0.000199
	(0.696)	(0.0716)	(0.0180)	(0.0883)	(0.700)	(-0.00462)
Constant	-0.0246	-0.0144	-0.00894	-0.00890	-0.0509*	-0.0296
	(-0.813)	(-0.492)	(-1.022)	(-1.020)	(-1.755)	(-0.980)
Observations	70	70	70	70	70	70

*** p<0.01, ** p<0.05, * p<0.1.
Pop = population.
Note: t-statistics in parentheses.
Source: Authors' estimates.

[26] Some studies show that democracy is negatively related to physical capital investment (e.g., Tavares and Wacziarg 2001). The explanation is along the same lines: establishing democracy requires resources, which in turn crowds out domestic investment.

The growth in middle class size is also driven by some time-invariant country characteristics. Generally, two effects stand out: regional effects and being landlocked. East Asia and the Pacific and the Middle East appear to be doing much better than South Asia and other regions in terms of the absolute measure, while Latin America, Eastern Europe, and Central Asia join them in terms of the relative median measure. We continue to find that a landlocked country not only has a smaller middle class, but also lower rates of middle class growth, as shown by the negative signs on the relative measures.

VI. Robustness Checks

In this section, we check the robustness of our results to the empirical specification and the data used.[27]

(i) ***Time Effects.*** In the main regressions specifications we excluded time dummies as their inclusion may be too restrictive if the dependent and independent variables in our regressions are time-dependent and, hence, may wash out the true relationship between the variables.[28] We check the robustness of our results to inclusion of the time dummies. We find that most of the results related to the middle class remain intact with the inclusion of time dummies in the models (not reported). The only exception is that the MC middle 60% becomes linearly positive (instead of nonlinearly) in the human capital model. On the other hand, schooling loses its significance in the growth model, which indicates that schooling has a time-dependent relationship with consumption growth.

(ii) ***Different Samples.*** We exclude the transition and oil economies from the unbalanced sample, as Mankiw, Romer, and Weil (1992) argue that these economies may not follow the standard Solow growth model. None of our results, especially those related to both factor inputs and middle class variables in equation (1), seem to be driven by these countries.

Using the balanced panel of data created with straight-line interpolations and covering 72 countries every 3 years from 1990 to 2008, we find similar results to those of the unbalanced panel. The robust impact of the middle class on human capital and, through this channel, on growth, is

[27] The results discussed in this section are not shown, but are available upon request.

[28] For example, the size of the middle class across countries can grow over time due to technological spurts and productivity shocks, or can shrink due to economic and financial crises. Likewise, many other variables such as schooling, urbanization etc., exhibit common movements across countries over time, with the world average (i.e., developing countries in our sample) increasing over time. Time dummies, if included in the model, not only capture these common movements, but also weaken the relationship between the dependent and some of the independent variables, because such movements are held constant in the model.

found again.[29] The direct effect on growth and the indirect effect on labor force growth seem nonexistent with this data set, while the positive effect on savings is observed with the absolute and the median measures. On the other hand, the size effects related to government provision, fertility, services and industry share relative to agriculture, and the effects related to log population and government role in the growth of the middle class size are replicated, as above. Finally, the effects of ethnic fractionalization and the German legal system on the size of the middle class and the effect of French legal tradition on the growth of the middle class are also repeated, as are the effects of regional factors.[30]

(iii) ***Control Variables.*** In the unbalanced sample, we use international migration stock (and its change) in the labor force equation, but it is always estimated as insignificant. This may be because international migration is probably a more relevant issue for developed countries. In equations (3) and (4), we experimented with the absolute size of the services and industry sectors. This did not make any material difference to our results.

It is possible that including the variables of vector *X* in equation (2) may bias the coefficient estimates of the middle class measures, given that some of the variables in *X* may be highly correlated with the middle class variables in equation (3). We find that even after dropping the variables that are significant in equation (3) from the factor input models, none of the middle class effects seems to suffer from multicollinearity.[31]

VII. Conclusion

Our examination of the contribution of the middle class to consumption growth suggests that the importance of the middle class is found to occur indirectly, primarily through its contribution to factor inputs, chiefly human capital. The relationship between the middle class and the levels of human capital is shown to be robust, positive, and highly significant for all middle class measures. There is also evidence that a larger middle class is associated with higher levels of savings in a country, but savings is estimated to be

[29] The only difference this time is that all middle class measures seem to have nonlinear effects on schooling, which increases at a decreasing rate.

[30] The only variable that is significant with the unbalanced panel but seemed insignificant in the two other samples is the level of democracy.

[31] One should not cause a misspecification problem while checking the appropriateness of the specification. We first regress each middle class measure on the variables in the X vector, as well as on country-fixed effects, as per equation (3). Then, we note the significant variables from this regression, and drop these variables from equation (2) if they are originally estimated to be insignificant (if they are originally significant in the factor input equations, then they are relevant and cannot be dropped), and observe the changes in the effects of the middle class measures.

insignificant in the growth model in our sample. We also find evidence that the share held by the middle 60% of the expenditure distribution may have a *direct* effect outside of its influence on growth through the factor inputs channel.

Overall, these results are consistent with Banerjee and Duflo's (2008) conclusion, based on an analysis of micro-level household survey data, that the middle class may matter for growth on account of their investments in human capital, something that is facilitated by steady employment that seems to be a key characteristic of what it means to be middle class. These results are also consistent with the view that a strong middle class is likely to lead to long-run development by positively affecting the proximate causes of growth (Acemoglu et al. 2005). The robust impact on consumption growth through schooling is also consistent with the increased demand for human capital during the industrialization process as suggested by Galor's (2005) unified growth theory, indicating where the demand may originate from. Our results also support the view that specifically targeting the middle class may help in the fight against poverty, compared to policies that solely aim to help the impoverished (Ravallion 2009, Birdsall 2010).

To the extent that policy makers would like to nurture the middle class, how should they do so? Our analysis reveals that there appear to be many deeply embedded institutional and cultural characteristics that are country-specific that can present difficulties when trying to foster the middle class. Specifically, countries with nondemocratic political systems, German and French legal traditions, greater ethnic fractionalization, and those that are landlocked, are found to have a significantly smaller middle class. However, our analysis also reveals avenues that foster growth of the middle class. For example, our results suggest that policies to spur on the private sector are likely to lead to faster growth of the middle class. They also suggest that policies that promote urbanization will boost the size of the middle class.

Appendix: Countries in Unbalanced Panel and Middle Class Size from First Year in Data

Country	First Year	MC ($2–$10)	HC ($10+)	Middle 60%	0.75%–1.25% Median
Albania	1997	86.56	6.67	53.49	36.78
Armenia	1996	57.83	4.34	43.88	23.48
Bangladesh	1986	18.97	0.23	52.70	8.87
Botswana	1986	41.09	4.84	37.38	8.94
Brazil	1987	52.1	18.99	34.25	17.97
Bulgaria	1989	14.31	85.79	55.71	47.15
Burundi	1992	5	0.1	50.42	2.17
Cambodia	1994	22.44	0.86	44.99	8.56
Cameroon	1996	24.94	1.36	40.36	8.07
Central African Republic	1993	8.97	0.57	33.00	2.61
Chile	1987	59.47	17.65	35.16	20.77
China, People's Republic of	1987	16.92	0.1	54.09	8.6
Colombia	2003	55.05	19.14	34.82	18.89
Costa Rica	1986	75.07	4.1	55.11	29.19
Croatia	1998	19.62	80.48	54.66	41.14
Cote d'Ivoire	1986	69.46	6.29	47.35	29.44
Dominican Republic	1986	61.13	9	43.99	23.2
Ecuador	1994	59.81	12.6	41.21	21.54
Egypt	1991	70.65	2.44	50.50	37.65
El Salvador	1995	62.9	12.26	41.97	23.08
Estonia	1993	70.45	27.92	47.18	31.19
Gambia	1998	17.72	0.77	40.71	5.25
Ghana	1988	21.51	0.22	50.34	8.5
Guatemala	1987	27.93	2.36	34.47	7.4
Honduras	1990	36.02	3.44	35.39	8.3
India	1988	16.74	0.4	.	7.12
Iran	1986	66.11	20.07	42.82	24.46
Jamaica	1988	71.86	14.35	45.54	27.54
Jordan	1987	78.54	19.94	49.15	31.4
Kazakhstan	1993	78.35	4.73	52.11	33.93
Kenya	1992	37.67	3.72	33.54	9.31
Kyrgyz Republic	1993	56.51	13.9	40.40	19.87
Lao People's Democratic Republic	1992	15.55	0.27	50.65	6.67
Latvia	1993	86.41	13.69	53.95	39.62
Lesotho	1987	34.68	3.7	37.06	7.99
Lithuania	1996	75.63	23.79	51.81	36.82

continued.

Appendix: *continued.*

Country	First Year	MC ($2–$10)	HC ($10+)	Middle 60%	0.75%–1.25% Median
Malawi	1998	6.93	0.55	38.19	2.43
Malaysia	1987	67.47	20.65	42.60	24.97
Mali	1989	30.52	0.71	48.98	10.94
Mauritania	1987	35	1.17	47.12	10.31
Moldova	1992	60.44	1.33	51.73	25.37
Mongolia	1995	57.64	0.36	52.27	21.55
Morocco	1991	75.28	9.03	46.93	30.12
Mozambique	1997	7.19	0.41	42.86	2.74
Nepal	1996	11.9	0.45	46.44	4.7
Nicaragua	1993	45.92	5.65	36.98	9.5
Nigeria	1992	8.98	0.33	48.33	3.86
Pakistan	1987	11.19	0.32	49.74	4.76
Panama	1995	50.96	29.4	37.80	18.55
Paraguay	1990	71.44	9.93	48.33	27.59
Peru	1986	61.18	33.51	43.92	25.56
Philippines	1988	41.89	2.06	45.70	11.66
Poland	1987	47.67	52.43	54.99	43.71
Romania	1989	42.19	57.91	56.76	46.49
Russian Federation	1996	61.17	29.96	44.25	25.72
Senegal	1991	17.68	1.09	37.40	5.63
Slovenia	1993	16.81	83.29	52.06	41.71
South Africa	1993	44.59	14.89	32.70	16.26
Sri Lanka	1991	50.84	1.24	49.69	18.1
Swaziland	1995	10.09	0.89	31.84	3.21
Tajikistan	1999	22.76	0.15	52.20	9.8
Tanzania	1992	9	0.1	50.95	3.85
Thailand	1988	56.43	4.46	43.63	22.08
Trinidad and Tobago	1988	62.29	29.47	47.12	24.91
Tunisia	1990	72.25	9.02	47.74	28.53
Turkey	1987	76.24	16.54	43.55	29.26
Uganda	1989	14.16	0.41	45.12	5.01
Ukraine	1992	74.59	25.51	55.74	39.99
Venezuela	1987	56.37	25.88	39.23	20.02
Viet Nam	1993	14.54	0.3	48.18	5.63
Yemen	1992	75.14	9.05	47.91	30.3
Zambia	1993	18.72	0.93	40.33	5.51

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About the Paper

Natalie Chun, Rana Hasan, and Mehmet Ulubasoglu investigate the channels through which the middle class may matter for consumption growth and development, as well as the determinants of size and growth of the middle class. Using different middle class measures and a panel of 72 developing countries spanning the period 1985–2006, they find that a larger middle class influences growth primarily through higher levels of human capital investment. While institutional and cultural characteristics may present barriers to fostering the middle class, enlarging governments, developing urban areas, promoting democracy, and limiting ethnic concentration are all potentially conducive to boosting the size of the middle class.

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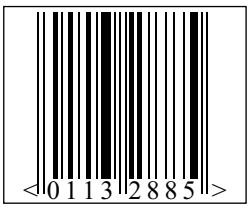

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