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Agricultural Exit Problems

Causes and Consequences

Derek Headey

Dirk Bezemer

Peter B. Hazell

Development Strategy and Governance Division

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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AUTHORS

Derek Headey, International Food Policy Research Institute
Postdoctoral Fellow, Development Strategy and Governance Division

Dirk Bezemer, University of Groningen, The Netherlands
Assistant Professor, Department of International Economics & Business

Peter B. Hazell, Imperial College, Wye Campus, London
Professor, Centre for Environmental Policy

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Contents

List of Tables

List of Figures

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ABSTRACT

Contrary to conventional economic theories, the relationship between income growth and the share of the population within the rural or agricultural sector is extremely diverse, even among regions starting from similar levels of development, such as Asia and Africa. The pattern in developing Asia is characterized by fast growth and slow urbanization, primarily as the result of labor-intensive agricultural growth and strong farm–nonfarm linkages. But for all its success to date, Asia appears to be increasingly vulnerable to rising inequality and jobless growth patterns. Africa presents a divergent pattern of slow growth with rapid urbanization stemming from urban-biased policies, low rural population density, and high rates of population growth. But whereas Africa's path of urbanization without growth presents problems like unemployment, congestion, and food-price inflation, it may also provide new development possibilities through greater political empowerment, lower fertility rates, and agglomeration externalities. The paper concludes with a discussion of how development strategies can address these agricultural exit problems.

Key words: economic growth, structural change, urbanization, agricultural exits, rural to urban migration, rural non-farm employment, inequality, employment, agglomeration externalities

1. INTRODUCTION

Long-run economic growth has been accompanied by a significant exodus of workers out of agricultural and rural areas and into the industrial and service sectors of urban areas (hereafter referred to as "agricultural exits").[1] This path of income growth with urbanization was regarded as a robust, stylized fact by early development economists and incorporated into a wide array of development theory (Lewis 1954; Kuznets 1955; Hirschman 1958; Kuznets 1973; and Chenery 1979). Since 1960, however, developing countries have followed remarkably divergent pathways of growth/urbanization, even among regions with similar initial conditions. Most of Asia has grown quickly but been urbanized relatively slowly, and most African economies made virtually no real net income gains in the four decades to 2000—especially since 1980—but continued to experience surprisingly fast agricultural exits. This paper explores the causes of this divergence between Asia and Africa, while also attempting to answer two "so what?" questions. The first of these relates to the so called micro–macro paradox (Gugler 1982): can agricultural exits can be suboptimally slow or suboptimally fast from a dynamic, macroeconomic perspective, even if migrants themselves make informed, rational, utility-maximizing decisions? And second, if the speed of agricultural exits can be suboptimal, is there anything that policymakers can do about it?

Attempts to answer these questions have a long but intermittent history in mainstream development debates. Much of the concern in the 1950s and 1960s was with over-urbanization and the emergence of megacities, first in Latin America (for example, Sao Paulo, Rio de Janeiro, Mexico City, and Lima) and then increasingly in Asia (Delhi, Bombay, Calcutta, Karachi, Dhaka, Manila, Bangkok, and Jakarta). After Sovani's (1964) balanced critique of the over-urbanization thesis, economists remained relatively quiet on the subject, although Harris and Todaro's (1970) work was a landmark paper in demonstrating how rational migrants could induce suboptimal outcomes at the macroeconomic level by adding to the problems of urban unemployment and congestion. The 1979 World Development Report on Structural Change and Development Policy augmented theoretical models with a wide array of empirical work on over-urbanization. The report demonstrated that while "urbanization in the industrialized countries took many decades, permitting a gradual emergence of economic, social, and political institutions to deal with the problems of structural transformation, the process in developing countries is occurring far more rapidly" (World Bank 1979, 72) especially in Latin America and Sub-Saharan Africa. Like Harris and Todaro (1970), World Bank (1979) pointed to the considerable costs of over-urbanization, especially in terms of urban unemployment and congestion, but it argued that urban population growth, not rural–urban migration, was the primary cause of the growth. As for the determinants of rural–urban migration, the report concluded that urban-biased policies were the leading policy determinants of over-urbanization, a theme introduced by Lipton (1977) and thereafter taken up by researchers within and outside the Bank (Bates 1981; World Bank 1984, 2000; Krueger, Schiff, and Valdes 1991; and Fay and Opal 1999).

Three decades on from World Bank (1979), the 2008 and forthcoming 2009 World Development Reports also reflect on these issues and justifiably posed new questions in light of additional facts and new knowledge. The 2008 report on Agriculture for Development to which an earlier version of the present paper contributed as a background paper, reexamines the role agriculture plays in growth and poverty reduction processes, and distinguishes between economies at different stages of urbanization and agricultural employment (World Bank 2008, Chapter 1). But the 2008 report also poses new questions about the challenges of agricultural exits (World Bank 2008, Chapter 9), especially the rural employment challenge—a theme just as relevant to Asia's "under-urbanization" problems as it is Africa's "over-urbanization." The forthcoming 2009 report on Spatial Disparities and Development Policies also focuses on the rural–urban transformation, as well as related issues of territorial development and regional integration (World Bank 2009 forthcoming).

[1] The terms "agricultural exits" and "urbanization" are used interchangeably throughout this paper, except when otherwise indicated; in certain circumstances they may differ because of the rural nonfarm economy and urban agriculture.

The present paper very much bridges the central themes of the 1979, 2008, and 2009 (forthcoming) World Development Reports. In addition to updating our understanding of traditional rural–urban transformation issues, the analysis is augmented with a discussion of processes that were not well understood three decades ago—not least the importance of the rural nonfarm economy in the transformation process and the role of agglomeration externalities in predominantly nonagricultural growth processes. Section 2 updates the stylized facts regarding the relationship between economic growth and the rate of agricultural exits, while also questioning the validity of the data and the implicit notion of an optimal growth path with urbanization. Section 3 looks to account for the most startling break from economic theory: the remarkable divergence between Asia and Africa's paths of growth and urbanization. Section 4 examines the possibility that Asia's surprisingly slow urbanization may be related to rising spatial inequality and jobless growth. Section 5 looks at the African context, where over-urbanization has been the traditional concern, despite more recent emphasis on the benefits that urban agglomeration externalities might have on Africa's growth prospects. The paper concludes with a discussion of how policymakers can address these problems. Africa still has the opportunity to follow Asia's example of labor-intensive agricultural growth, but policymakers need to address the rise of the informal economy in African cities. In Asia, scope still exists to expand the rural nonfarm economy and to facilitate the capacity of smallholders to profit from new market opportunities. But wherever smallholders are fundamentally uncompetitive, public policies must facilitate smoother agricultural exits through improved land markets, better education and retraining, less-protected labor markets, and public investments aimed at enhancing off-farm employment opportunities.

2. AGRICULTURAL EXITS AND THE GROWTH PROCESS: ECONOMIC THEORIES AND STYLIZED FACTS

Structural change is a broad term covers the shift of output, employment and livelihoods away from the rural/agricultural sector toward a predominantly urban agricultural sector. This paper primarily focus on the shift from agricultural to nonagricultural livelihoods, as measured by shares of nonagricultural population in the total population,[2] and urban population in the total population.[3]

What does economic theory lead us to expect? Although schools of thought differ as to their explanations of why structural change should accompany economic growth, all schools emphasize that structural change is intimately connected with the growth process. For example, industrialization strategies emphasize a modern industrial sector as the engine of growth. In this view, agriculture is largely a backward, unproductive sector in which labor operates at low levels of productivity; it may even be characterized by zero marginal productivity or surplus labor (Lewis 1954), and it has weak up- and downstream linkages with other sectors (Hirschman 1958).[4] In contrast, modern industry is a sector with considerable technological potential, increasing returns and agglomeration externalities, high degrees of labor intensity (at low levels of industrialization), and strong linkages to other sectors.[5] The differential economic potential between the sectors is such that a transfer of labor and capital from agriculture to nonagriculture constitutes a significant source of both structural change and economic growth.[6]

A second school of thought argues that agriculture can be an engine of growth, certainly at early stages of development. As agriculture is often more labor-intensive than nonagricultural industries (Schultz 1964), gains in agricultural productivity can contribute to higher employment and incomes, better nutrition, and faster poverty reduction, while preventing distress migration from rural areas into urban unemployment. The Green Revolution demonstrated agriculture's considerable technological potential, as well as the benefits of its extensive up- and downstream linkages to broader economic growth (Bezemer and Headey 2008). Indeed, the potential of a dynamic agricultural sector to keep food prices low (and thereby curb wage inflation), to provide foreign exchange earnings via exports, and to increase rural demand for nonfarm production and consumption goods suggests that agriculture can make substantial contributions to the industrialization process (Johnston and Kilby 1975). So this agriculture-first view also predicts that structural change and growth go hand in hand, but it distinguishes itself from the industry-first school by asserting that agricultural growth significantly drives nonagricultural growth, especially at early stages of development (Diao et al. 2005; Hazell and Diao 2005; and Bezemer and Headey 2008).

From Theory to Experience: The "Stylized Facts" of Structural Change and Growth

Despite different assumptions and very different policy prescriptions, both views posit a strong positive association between measures of structural change and economic growth. With respect to the share of nonagricultural output in total output, this hypothesis is certainly well supported by the stylized facts:

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[2] Nonagricultural population (the nonagricultural labor force plus their dependents) was chosen rather than the nonagricultural labor force because child and old-age labor are so common in developing countries. In practice, the two measures are almost perfectly correlated, so the distinction does not affect the empirical findings.

[3] The distinction between population shifts and output shifts is very important in this context. Changes in nonagricultural output shares tell a very different story than do urbanization and agricultural labor outflow data, with markedly different implications for growth and development. In particular, the cross-country relationship between changes in income and changes in nonagricultural output shares appears to be much tighter than the equivalent relationships for urban and nonagricultural population shares (see Figure A.1 in Appendix A).

[4] Lewis followed Classical economists in his assumptions. In their view, agriculture's technological potential is limited, and fertile land is largely fixed, so land and other complimentary inputs suffer from severely diminishing returns (Smith 1776; Malthus 1798).

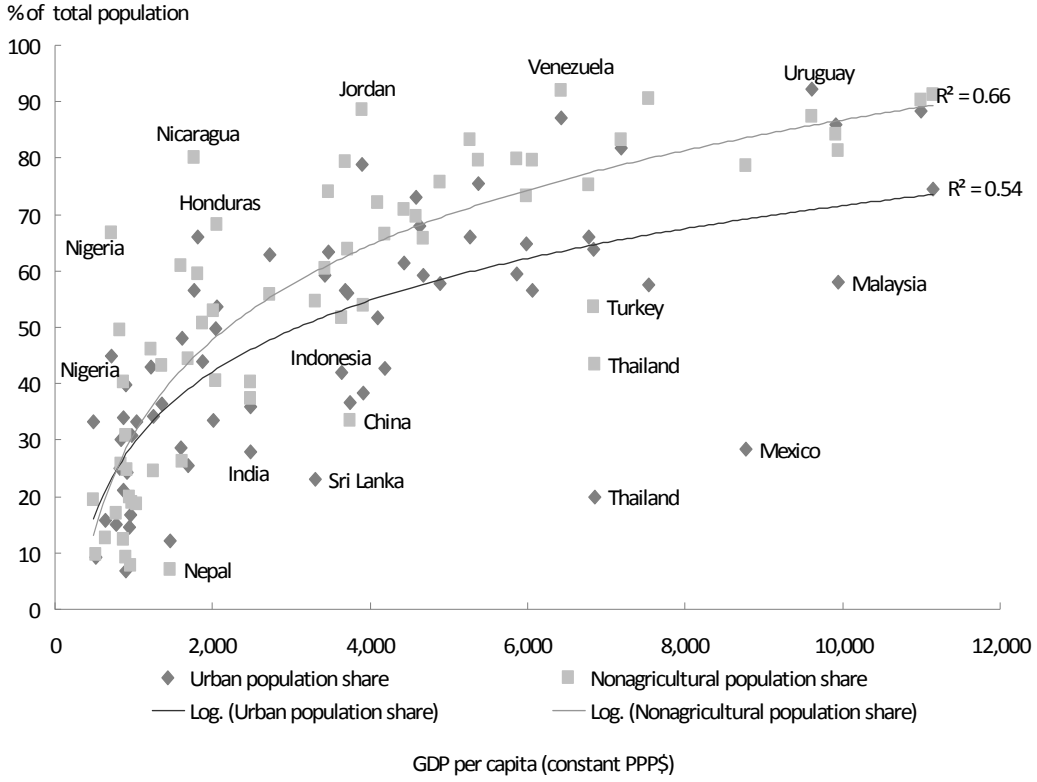
[5] Other views also emphasize the effect of urbanization on the modernization of attitudes and beliefs (Brohman 1997).

[6] See Temple and Woessman (2006) for a review.

nonagricultural output shares rise in a fairly systematic fashion as GDP per capita rises, both in the long run and in the short run (see World Bank 2008, Figure 1.2). But what about the shares of the urban population in the total population, or nonagricultural employment in total employment; are these just as strongly correlated with GDP per capita?

Superficially, the answer is yes. Figure 1 demonstrates the conventional "long-run" associations among GDP per capita, the nonagricultural employment share, and the urban population share. Several facts are of note. First, the relationships are somewhat nonlinear, suggesting that urbanization first increases more rapidly than income, while urbanization and growth thereafter proceed in a more linear fashion (see also World Bank 2008, Figure 1.2). Second, the nonagricultural employment shares increase to higher levels than urbanization shares, suggesting that the rural nonfarm economy becomes increasingly important as development proceeds. Third, the relationship between sectoral employment shares and income is stronger than that of urbanization shares and income. Fourth, a number of Asian countries tend to be well under the "average" log-linear regression lines, perhaps suggesting some degree of under-urbanization; likewise, a number of non-Asian countries are well above the regression lines, perhaps suggesting over-urbanization. But despite these outliers, both relationships are reasonably strong (correlation coefficients with income are in excess of 0.70 for both population measures).

Figure 1. Alternative development paths: Relationships between growth and urbanization, 1960–2000



Source: GDP data are from Summers and Heston (2002); urbanization data are from the World Bank (2007).

On the basis of this strong "long-run" relationship one might be tempted to conclude that over- or under-urbanization are not serious concerns. But this static snapshot largely obscures the diversity of the relationships between growth and urbanization since the end of the colonial era. What happens, then, when these processes are viewed more dynamically? Figure 2 maps income and agricultural exit paths for Asia, Africa, and several large developing countries over the period 1960–2000. Figures 2a and 2b reveal

that the trajectories for different regions and specific countries are highly diverse. Furthermore, whereas some differences exist between the urbanization and nonagricultural employment trajectories, both tell much the same story.

In Figure 2a, for example, a somewhat simplified story is as follows. The four major developing regions—Asia, Latin America, the Middle East, and Sub-Saharan Africa (SSA)—have followed three different trajectories since 1960. Latin America and the Middle East fall into an intermediate category, each comprising mostly lower middle-income countries that have become considerably urbanized and have typically experienced modest economic growth, albeit with some variation.[7] Asia, and especially East Asia, followed a second path by urbanizing slowly and growing very quickly from a generally low base.[8] In most Asian countries an income increase of a US$1,000 per capita only resulted in a 10-percentage-point increase in the urbanization share. China's low rate of urbanization is well documented, but Indonesia has followed a remarkably similar path, and India is on a similar trajectory despite less substantial income gains. Other Asian countries—Sri Lanka, Malaysia, Bangladesh, Thailand, Vietnam, Nepal, Pakistan—have followed a parallel trajectory but with even lower absolute urbanization levels. The one exception in this sample is the Philippines. From 1960 to 1980 the Philippines followed the usual East Asian path of fast growth (a gain of roughly $1,250 per capita) and modest urbanization (just a 7-percentage-point increase). But a sharp growth deceleration from 1980 to 2000 left income unchanged, while urbanization increased threefold (22 percentage points).

Although it started from a very similar base to that of Asia, Africa has followed an opposite path to Asia's, urbanizing surprisingly quickly despite low growth. One caveat here is that Africa's growth and urbanization story is more nuanced than Asia's. Africa's largest country, Nigeria, has experienced 40 years of urbanization without growth (in fact, Nigeria's GDP per capita actually declined by $300, while urbanization increased by over 30 percentage points). As for the rest of Africa, this basic trajectory of urbanization without growth still holds, but not quite so dramatically. Further, the dynamics of the trajectory are more similar to those of the Philippines than to those of Nigeria: the rest of Africa experienced modest rates of growth and urbanization from 1960 to 1980, before experiencing 20 years of stagnant income growth, which coincided with a doubling in the pace of urbanization. Moving beyond averages, urbanization rates within Africa really fall into three tiers over the 1980–2000 period (see Appendix A, Table A.1). The fastest urbanizers—that is, those that experienced changes in urbanization levels of 20 points or more—are mostly oil producers like Angola, Cameroon, Nigeria, and Sudan. A second group experienced shifts of 10–15 percentage points (for example, Sierra Leone, Ghana, and Rwanda), which is still high compared with Asia's trajectory, and a third group experienced changes of less than 10 percentage points.

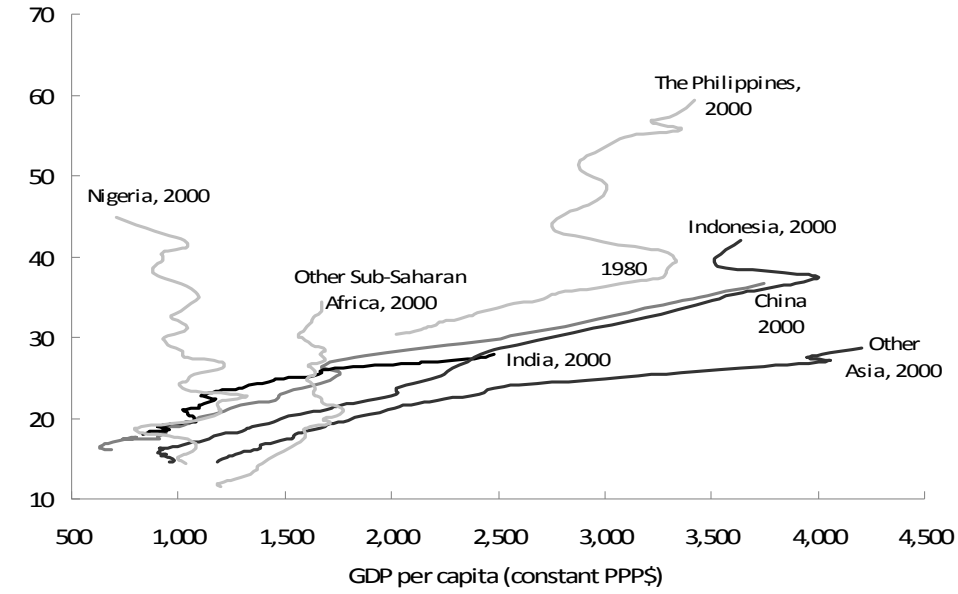
These dynamic portraits of alternative urbanization paths (Figure 2) tell a very different story to that of the "long-run" snapshot in Figure 1, but they also call into question the idea that the long-run average is in some sense an appropriate benchmark against which countries can be identified as "over-urbanizers" or "under-urbanizers." On the basis of Figure 2, for example, one might conclude that since Asia has experienced the most rapid economic growth, its process of very slow urbanization represents a "best practice" benchmark. This presumes, of course, that slow urbanization unambiguously contributes to faster economic growth. Such a view is quite questionable, however. Urbanization could merely be a byproduct of other growth determinants, yet not have any direct influence, by itself, on growth. Even more confounding for this analysis is the possibility that these stylized facts are actually biased by some serious data issues.

[7] Although the discussion does not focus on these countries hereafter, it is important to note that many countries in these regions have been characterized by urbanization without growth at various stages of their development. Several Central American countries, along with Algeria, Ecuador and, Peru, are notable examples worthy of further research.

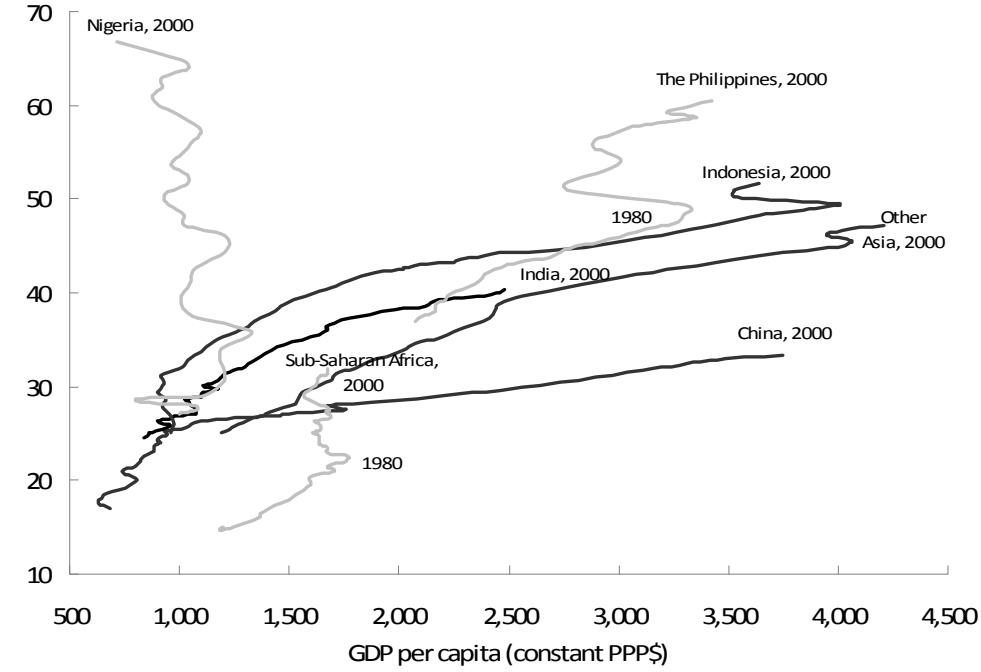
[8] South Korea is not included, but it did not follow the standard Asian path in that it became urbanized very quickly, partly because of a weaker nonfarm sector relative to comparable countries, such as Taiwan (Otsuka 2007).

Figure 2. Alternative development paths: Agricultural exits and economic growth, 1960-2000

2a. Urbanization



2b. Nonagricultural employment



Sources: GDP data are from Summers and Heston (2002); urbanization data are from World Bank (2007); data on labor force shares are from FAO (2006).
Notes: "Other Sub-Saharan Africa" and "Other Asia" denote average results for other developing countries in this region, excluding those already shown in the figure.

Stylized Facts or Stylized Falsehoods?

Are the remarkably divergent trajectories of Asia and Africa real, or are they somehow induced by biases originating from either economic growth data or the two measures of agricultural exits used? In truth, all three measures are far from perfect.

Demographic/employment data at the national level are especially flawed due to conceptual problems, as well as infrequent and imprecise measurement. Definitions of urbanization vary across countries and are sometimes changed even within countries (World Bank 2003). In the course of this study, various definitions of "urban" were examined for some 76 developing countries in the 2003 revision of the United Nation's World Urbanization Prospects (UN 2004). The diversity of what is defined as urban is truly immense. Only 15 countries use a numerical classification of urban town size, but even among these the towns may vary from 500 people (Papua New Guinea) to 2,000, 2,500, 4,500, 5,000, 10,000, and—for Nigeria—20,000 people. In many small African countries, only the capital city is defined as urban. And worse still, population-based definitions of urban may be biased over time by rapid population growth as rural towns grow into urban agglomerations without any truly significant changes in livelihoods. Among nonnumerical definitions of urbanization even greater variation exists. Countries like Brazil and China rely on various economic or legal characteristics to distinguish between rural and urban classifications. In China this definition has changed for each of the past five censuses (further discussion follows). In addition to these fundamental data issues, United Nations (UN) estimates and projections of urbanization rates have been widely criticized. Much of the data offered by the UN are merely estimations, even for the 1980s and 1990s, and Cohen (2004) has demonstrated that previous UN urbanization estimates (used in Figures 1 and 2) have been systematically biased upward for countries at low and lower middle levels of development.

Alternatively, employment-based measures of agricultural exits can be used instead of urbanization data, but they can also be biased. The significant and increasing prevalence of nonfarm diversification strategies among farmers in developing countries means that only looking at primary occupations in rural areas underestimates the true rate of agricultural exits. Many such part-time exits from agriculture remain unobserved but are likely to add up to a substantial shift in economic activities at the national level. Moreover, labor force surveys and population censuses that classify workers by their main activity typically miss large numbers of casual wage earners. In rural Africa, for example, recent in-depth studies suggest that participation in the agricultural labor market is far greater than large-scale household surveys suggest (World Bank 2008). Note, then, that these biases in urbanization and employment data appear to run in opposite directions (urbanization is overestimated, and nonagricultural employment shifts are underestimated). On these grounds both measures are typically reported.

Biases in GDP growth data are also important. Most national accounts data for developing countries largely go unquestioned, which is surely not justifiable, but Maddison (1998) reported a full 2-percentage-point drop in per capita GDP growth from China's post-1978 averages. Chinese and international academics have documented a wide range of falsifications and inconsistencies in important statistics (Holz 2004; Rawski 2001; Wang and Meng 2001). A more pervasive problem, especially in Africa, is the informal economy. Many firms in developing countries are not registered with governments, do not pay taxes, and produce outputs that are not recorded in national accounts. Schneider (2005) finds that the average size of the informal sector in 110 developing countries for 1999/2000 was 41 percent of official GDP, and that the growth of the informal economy has been especially rapid in Africa, rising from 34 percent of formal GDP in 1990/91 to 41 percent in 1999/2000; in rapidly urbanizing Nigeria, the increase was from 47 to 58 percent. Moreover, Schneider's estimates of informal sector growth rates were indeed found to be significantly negatively correlated with formal sector economic growth, especially in the nonagricultural sector (Appendix B). This result may not be meaningful, however, because the measures of government intervention used by Schneider to estimate the size of the informal economy are likely to be urban biased anyway, but the possibility that economic (especially nonagricultural) growth in Africa has been underestimated could partly explain the surprisingly fast urbanization in many African

countries. In other countries, such as the Philippines, the omission of overseas workers' remittances also leads to underestimation of real output growth.

Could these various biases in demographic and national accounts data lead to some convergence of Asia's and Africa's markedly different trajectories of growth and urbanization? Some convergence, yes. A country like China might have had lower growth and faster urbanization than their data suggest, and a country like Nigeria might have had faster growth and slower urbanization than their data suggest. That being said, for these two growth and urbanization trajectories to substantially converge, the margins of error in the statistics would have to be very large indeed. Moreover, the basic African and Asian stories are broadly validated by other forms of evidence. African cities have grown very quickly, for example.[9] Some 10,000 people are estimated to migrate to Lagos every day, and microeconomic data also suggest that real incomes in Nigeria have declined in recent decades, so it is not obvious that Nigeria's macroeconomic data is biased (and with a 20,000 person cut-off level, Nigeria also has a stringent definition of "urban").[10] In China, the huge size of rural industry and government restrictions on rural–urban migration are also consistent with a lower urbanization rate than is typically the case, although China's urbanization rate is probably still heavily underestimated (see below). So while the rapidly divergent trajectories between Asia and Africa, and between countries like Nigeria and China, might be partially closed by better data, the residual divergence still presents a set of stylized facts worthy of further investigation.

[9] African cities such as Lagos, Dhaka, Abidjan, Kinshasa, Nairobi, and Khartoum experienced average annual growth rates of 7.1 percent per year in the 1980s. From 1990 to 2005 population growth in these cities was just under 6 percent but in absolute terms was very high.

[10] The World Bank's Povcal data, for example, suggests that mean household income in Nigeria declined by 2.5 percent between 1985 and 2003.

3. EXPLAINING THE DIVERGENCE BETWEEN AFRICA AND ASIA

Why are some countries, especially in Africa, urbanizing without growth? And why have most of Asia's fast-growing economies not experienced more urbanization? This section further explores these divergent paths of urbanization and growth, with the caveat that some aspects of urbanization processes—especially the determinants of rural-to-urban migration—can have complex country-specific determinants that are not amenable to discussion here (see de Brauw and Carletto 2008 for a review, and Karp 2007 for a recent theoretical model). Moreover, there may also be global factors driving urbanization—such as globalization and urban-biased technological change—but since such factors do not obviously account for the divergence in urbanization paths between Asia and Africa, they have been omitted from the following discussion.

Six interlinked factors predominantly explain the divergence in growth and urbanization paths across Africa and Asia (Table 1). A realistic explanation of why people migrate needs to incorporate a wide range of factors in addition to simple income differentials. Rural–urban migration decisions begin on the farm, where households compare information on potential income streams on and off the farm. At the very least, rural households factor in not only the expected size of sectoral earnings, but also the risks and uncertainties of income streams, rural–urban price differentials, differences in access to services, and the costs of migration (de Brauw and Carletto 2008).

Table 1. Why has Africa urbanized relatively quickly, and Asia relatively slowly?

Factor	Effect in Africa	Effect in Asia (excluding the Philippines)
Agricultural and rural development policies	Urban-biased policies discriminate against rural areas and agriculture, especially smallholders; public expenditures are typically less than 5 percent of total expenditures and declining in many countries.	The Green Revolution promoted labor-intensive technologies; public investments in agriculture are generally 10 percent of total expenditures; price discrimination against agriculture is generally low.
Vulnerability and risk	Subsistence farmers lack access to irrigation (and are therefore vulnerable to weather shocks) and sources of rural income diversification, encouraging migration to cities.	Income growth, access to irrigation, and access to rural nonfarm employment have slowed migration to cities.
The rural nonfarm economy (RNFE)	RNFE is generally small because of lower population density, poor infrastructure, and weak stimulation from agriculture.	RNFE is generally large because of high population density, better infrastructure, strong farm–nonfarm linkages, and favorable public policies (for example, town and village enterprises in China, cottage industry in India, and family firms in Taiwan).
Population density	Population density is low in many parts of Africa, making rural investments costly, and inhibiting rural nonfarm development.	Population density is high, facilitating greater access to both urban markets and large rural towns, as well as more cost-effective investments.
Declining food prices	Asia's Green Revolution and OECD policies contributed to a drop in international food prices, discouraging domestic food production in Africa.	Food price declines were accompanied by sizeable productivity increases and price stabilization and procurement programs, both of which boosted farm revenue.
Demographic forces	Rapid rural population growth has created land pressures in some rural areas, but urban population growth has also been rapid. Family planning policies are limited.	Population growth slowed because of fast and balanced economic growth, as well as a wider and more effective implementation of family planning policies.

Source: Compiled by authors.
Note: OECD indicates Organisation for Economic Co-operation and Development.

Taking these factors into account, a major difference between the two region's growth and urbanization paths is the success of the Green Revolution in Asia and its failure in Africa. Specifically, this revolution delivered four outcomes that constrained rural–urban migration in Asia (Timmer 2002; Rosegrant and Hazell 2000). First, it catalyzed rapid growth in farm incomes. Second, the Green Revolution technologies were, initially at least, highly labor-intensive. Third, the increased use of modern techniques, the adoption of procurement programs, and rising global food prices in the 1960s and early 1970s all helped stabilize farm incomes as farmers adopted these new technologies. And finally, rapid growth in farm production raised demand for nonfarm goods and services, many of which were provided locally.

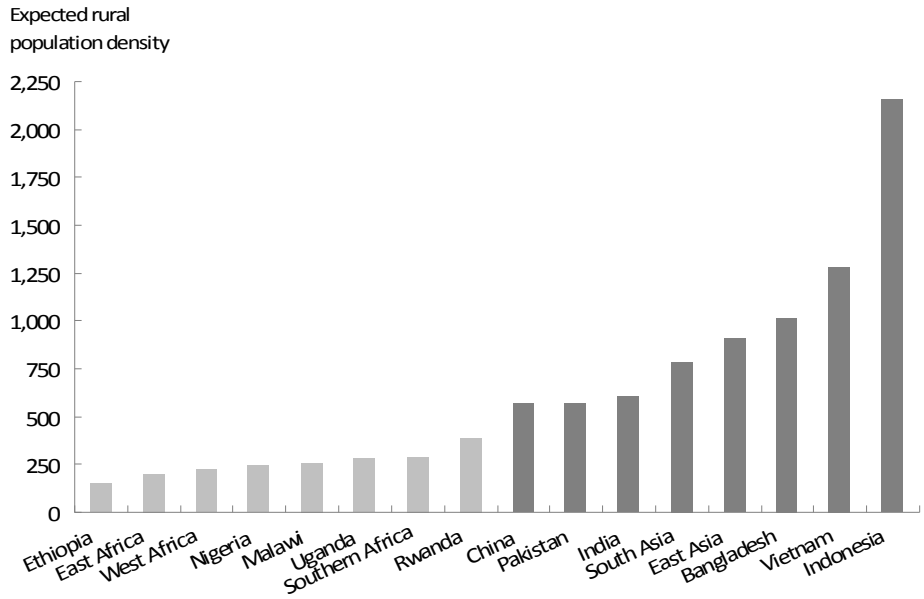
Africa, in contrast, failed to induce a Green Revolution: per capita agricultural output stagnated and even declined over much of Africa from 1960 onward, and the adoption of modern techniques is much lower in Africa than in all other developing regions (see World Bank 2008, Figures 2.1 and 2.2). The reasons for this failure are complex, but they can broadly be grouped into exogenous factors (that is, endowments) and endogenous policy-related factors (Johnson, Hazell, and Gulati 2003).

In terms of exogenous factors, Africa is constrained by its geography in at least two ways. First, Africa possessed much more diverse agricultural conditions and outputs than Asia. Food and Agricultural Organization of the United Nations (FAO) data suggest that in 1980 about a quarter of total crop land in Asia was devoted to rice, maize, and wheat—the first crops to benefit from high yielding varieties—whereas just 11 percent of Africa's cropped area was devoted to these crops, and most of this was maize. Second, rural population density in Africa is much lower than it is in Asia. Population density is a cross-cutting factor in that low population density constrains access to input markets (for example, fertilizers), access to output markets, the growth of the rural nonfarm economy (Haggblade et al. 2007b), and the provision of economic infrastructure and social services (that is, a road that services a million passengers yields higher benefit–cost ratios than one that services 10,000). How much lower is rural population density in Africa? It has previously been difficult to get an accurate answer to that question because simply dividing arable land area by the total population can be very deceptive if there are large clusters of rural people in particular areas combined with significant tracts of largely uninhabited land. Geospatial mapping, however, enables the "expected" rural population density to be re-estimated, which is the population-weighted average of rural population densities in subnational regions—in this case, square kilometer grid points (Figure 3). This measure therefore reflects the population density that a typical rural inhabitant expects to experience within these countries. Figure 3 clearly demonstrates that most Africans live in areas that have about one-quarter of the population density of Asian populations.

With regard to policies, African governments generally discriminated against agriculture and rural populations through biases in macroeconomic policies and public investments (Lipton 1977; Bates 1981; Krueger, Schiff, and Valdes 1991; Hazell and Diao 2005; and Bezemer and Headey 2008). As Bezemer and Headey (2008) discuss, urban-biased development policies partly arose because of historical and ideological forces dating back to colonial policies, the import-substitution/industrialization strategies of the 1950s and 1960s, and the neglect of agriculture among foreign aid donors. But such biases are also institutionalized by the political disenfranchisement of the rural poor—and, in some cases, particular rural ethnic groups—whose socioeconomic conditions and political environment impede effective political action (Binswanger and Deininger 1997). How important are these policy factors? While macroeconomic distortions against African agriculture have declined since the 1980s, albeit from very high levels, public investment and foreign aid to African agriculture have both declined markedly since 1980, and welfare measures still indicate very high differences between rural and urban populations (Bezemer and Headey 2008). World Bank (2003), for example, finds that access to safe water, improved sanitation, and education and health services is generally 20 to 30 percentage points higher in urban than in rural areas, and Hewett and Montgomery (2001) find that 88 percent of Africa's urban households have access to electricity services compared with just 5 percent of rural households. In contrast, Asian countries have generally had much better macroeconomic policies, and Asian governments have typically invested heavily not only in agriculture, but also in rural infrastructure, education, and health (although much of South Asia is an exception in this regard). Some Asian countries—China and Taiwan, in particular—also

enacted highly successful rural industrialization policies, which resulted in rapid growth in the rural nonfarm economy (Mukherjee and Zhang 2007; Otsuka 2007).

Figure 3. "Expected" rural population densities in Africa and Asia, 2000



Source: Calculated by authors based on GRUMP (2008).
Notes: "Expected" rural population density is the sum of populations in square kilometer grids in a country, weighted by the population shares of the grids within the total country population. This measure is therefore "population-weighted population density," and it reflects the population density experienced by an average rural person. Regional population densities were calculated for each region as a whole.

In addition to these geographical and policy-related factors, demographic forces play a very important part in explaining urban population growth. As a rule, intra-urban population growth accounts for 50 percent or more of total urban population growth (Todaro 1997), so differences in urban birth rates and death rates across countries also account for differences in urbanization trends, and also influence the degree to which rural towns are simply recategorized as urban agglomerations because of population growth.[11] For a range of reasons related to faster income growth, better education for girls and women, cultural differences, and more widely implemented population policies (Kelley and Schmidt 2003), Asia's population growth rates since 1960 have been about 25 percent lower than those of Africa.

In conclusion, Asia's and Africa's divergent paths of growth and urbanization are due to more adverse rural and agricultural conditions in Africa (which primarily affect rural–urban migration), as well as faster population growth (which primarily affects intra-urban population growth). While it is difficult to bring direct evidence to bear on these factors at the macroeconomic level, the available evidence is certainly consistent with the hypothesis that Africa has been experiencing stress migration and immiserizing population growth. Ravallion, Chen, and Sangraula (2007) combine international headcount poverty measures from household survey data with UN urbanization data to decompose poverty reduction into rural poverty reduction, urban poverty reduction, and the effects of rural–urban transitions. They find that between 1993 and 2002 the poor have been urbanizing faster (in proportionate terms) than the population as a whole, especially in Latin America and Sub-Saharan Africa. Their evidence also suggests

[11] Rural population growth could also encourage urbanization, especially if it creates land pressure or smaller farm sizes through the processes of inheritance.

that urbanization has made some positive contribution to overall poverty declines, which partly explains the rational migration of the poor in the first place, although the effect is not very large (accounting for less than one-fifth of the variation in poverty reduction). Asia, in contrast, has been shown to have benefited enormously from economic growth in rural areas, such that rural poverty has declined significantly (Ravallion and Datt 1996; Rosegrant and Hazell 2000; Christiaensen, Demery, and Kühl 2006; Chen and Ravallion 2007; and Ravallion, Chen, and Sangraula 2007), thus mitigating the urbanization of poverty.

The remainder of this paper is devoted to assessing the implications of these trends for future economic development of each region. Will Africa continue to urbanize its poor, or will urbanization unlock new growth opportunities? Is Asia's slow urbanization path still optimal (if it ever was), or is it contributing to rising inequality and unemployment?

4. GROWTH AND "UNDER-URBANIZATION" IN DEVELOPING ASIA

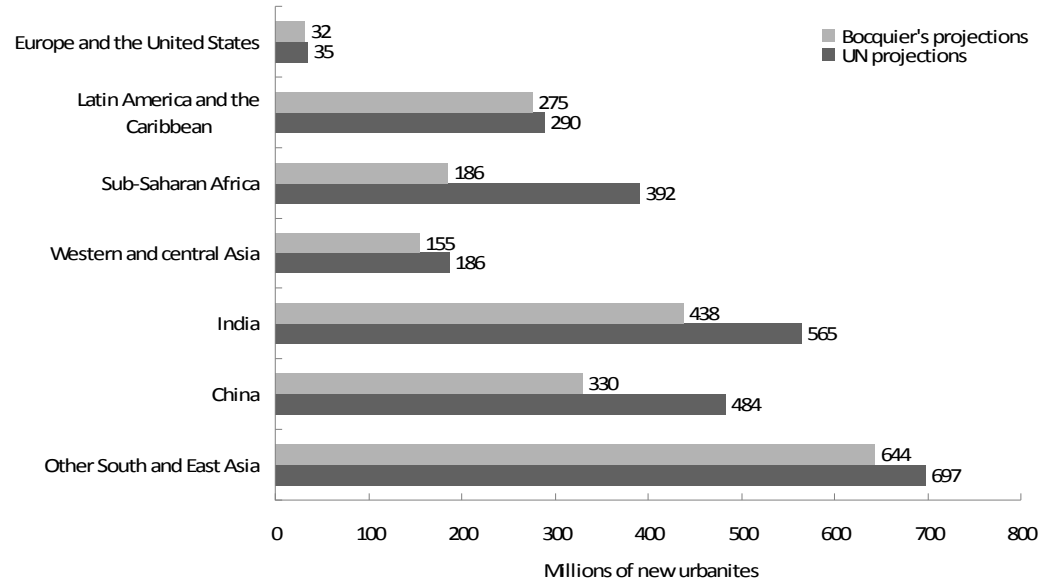
The previous section reported an Asian story that bore all the hallmarks of an economically successful development path. The Green Revolution triggered rapid agricultural growth in per capita agricultural output, which further catalyzed powerful growth and poverty-reduction linkages for the nonagricultural economy through increased demand, lower food prices, and cheaper intermediate inputs. Moreover, because of high population densities; dense road networks; and the proliferation of spatially dispersed, medium-size towns, a large share of Asia's industrial development occurred in rural areas, enabling many workers to move out of agriculture while continuing to live and work in rural areas. These dynamics have produced a balanced, pro-poor growth orientation in which real income gains have historically been spread equally across sectors, space, and population groups. Asia thereby avoided (or at least, mitigated) many of the problems associated with rapid urbanization, especially rising urban unemployment and its associated problems.

The question posed in this section is whether Asia's unique path of growth and urbanization—combined with Asia's other distinctive characteristics, such as its large populations and small farm sizes—is becoming increasingly disadvantageous for Asia's future economic growth and poverty reduction. The first concern is that Asia's rural sectors cannot ensure further poverty reduction because of declining yield growth, shrinking farm sizes, decreasing labor intensity, demographic change, and "brain drain," as well as the persistence of poverty among particular social groups and in particular geographically disadvantaged regions. The second concern is that if Asia's rural sectors are running out of steam, how will Asian economies prevent rising rural–urban inequality—and, in particular, how will these sectors create enough jobs outside of agriculture, especially given the vast numbers of people involved in Asia's continuing agricultural exit? But before addressing these two questions, does Asia really have an agricultural exit problem?

Section 2 emphasized the lack of comparability in urbanization measures across countries based on variation in the definition of "urban" across countries, noting that these problems were especially acute in China. Since the "absolute numbers" story is very important in the Asian context, reconsidering China's, as well as India's, urbanization data in more detail is also important. In China, the definition of what is urban has varied across censuses, making it very difficult to infer time trends. Moreover, China's definitions vary markedly from those used in other countries. Specifically, China now uses a stringent definition of urban agglomerations (100,000 inhabitants) together with a functionalist definition of primarily nonagricultural activities. Using a more standard definition of urban areas (for example, agglomerations of 5,000 inhabitants or more, as in India) would obviously lead to a much higher level of urbanization.

Existing definitional differences across countries also create problems for projecting future urbanization trends, which, among other things, give some indication of the number of nonagricultural jobs that Asia will be required to create in coming years. Bocquier (2004) argues that the UN overestimates future urbanization in China because the linear projection method for urbanization used is based on a comparison of existing urbanization rates in China and average urbanization rates for all reasonably large countries (those of greater than 2 million persons). Since China's existing urbanization rates are lower than the world average, partly for definitional reasons, the UN projection method exaggerates projected numbers of new Chinese urbanites over the next 25 years. Bocquier identifies similar upward biases in urbanization projections for a range of developing countries (including India), and instead employs a country-specific nonlinear model to re-estimate urbanization trends to 2030. This alternative method produces urbanization numbers that are roughly 32 percent lower for China, 22 percent lower for India, and 40–50 percent lower for Africa (Figure 4). Thus the UN predicts that during 1990–2030 the number of urbanites in these regions will have increased by 2.65 billion, whereas Bocquier estimates an increase of 2.06 billion.

Figure 4. Contrasting projections of the number of new urbanites, 1990–2030



Sources: UN (2004); Bocquier (2004, Table 1).

While the differences between the UN estimates and those of Bocquier (2004) are significant, the absolute numbers of new urbanites are potentially daunting in either case, especially in Asia. Both the UN and Bocquier project that about two-thirds of these new urbanites will be Asian, with the UN projecting 1.75 billion new urbanites in Asia, and Bocquier projecting 1.41 billion. Even using Bocquier's lower estimates, these figures amount to about 8 million new urbanites per year in China, 11 million per year in India, and 16 million per year in the rest of Asia.

Given these numbers, the next question is whether this change in urbanization also requires a significant change in economic activities. To gauge this, it is first necessary to consider the rural nonfarm (RNF) economy (Table 2). Asia has quite large RNF employment shares, suggesting that a great deal of structural change has already taken place in much of rural Asia. But even these employment shares still hide the true size of the RNF sector, because census employment data typically only measure primary or full-time jobs, even though many farmers have secondary and tertiary employment in the sector. This underreporting is reflected by the fact that RNF income shares are typically 1.5 to 2 times higher than RNF employment shares. So, if nonagricultural employment in Asia is currently underestimated, Asia may not need to create as many new jobs outside agriculture over the next 20 years as we currently think.

With these important data considerations in mind, there are nevertheless some legitimate reasons for believing that Asia does have an inefficiently large and growing backlog of agricultural workers who require more employment opportunities outside agriculture. Four significant pieces of evidence are consistent with this conjecture, each of which is discussed in turn below.

Table 2. The importance of rural nonfarm employment in developing countries

Country/ region	Year	% RNF employment	Country/ region	Year	% RNF employment	Country/ region	Year	% RNF employment
SUB-SAHARAN AFRICA			DEVELOPING ASIA			LATIN AMERICA		
Cameroon	1987	9.1	Bangladesh	2001	24.4	Argentina	1980	37.4
Cote d'Ivoire	1988	10.8	China	1999	26.0	Bolivia	1988	23.0
Ethiopia	1994	3.1	India	1991	17.7	Chile	1984	33.6
Malawi	1998	10.6	Indonesia	1995	36.9	Dominican Republic	1981	37.7
Mozambique	1980	7.3	Iran	1986	42.0	Ecuador	1990	35.5
Namibia	1991	28.0	Korea	1980	27.9	Guatemala	1981	23.8
Zambia	2000	10.4	Nepal	1981	5.6	Honduras	1988	21.5
Average		*11.4*	Pakistan	1998	43.6	Uruguay	1985	25.6
MIDDLE EAST AND NORTH AFRICA			Philippines	1980	25.3	Venezuela	1990	33.1
Egypt	1986	34.3	Sri Lanka	1981	39.2	*Average*		*30.1*
Morocco	1994	22.7	Thailand	1996	50.1			
Turkey	1990	14.8	Vietnam	1997	21.9			
Average		*23.9*	*Average*		*30.1*			

Source: Data excluding China are from Haggblade et al. (2007b); data for China are from Muklherjee and Zhang (2007).
Notes: RNF indicates rural nonfarm. These data are relatively comparable, census-based estimates of the rural nonfarm share of total rural employment.

Barriers to Rural–Urban Migration

While Asia's urban populations may be underestimated, some very real barriers still hinder rural–urban migration in Asia. The most extreme example is China's houkou system, which is intended to restrict rural–urban migration (although Vietnam has followed similar policies). Such policies have mostly been relaxed in recent years, but migrants in China still lack many basic entitlements (such as access to health and education services), which still discourages migration. Vietnam, Indonesia, Malaysia, and other Asian countries have used intra-rural resettlement policies, which may also have prevented more rapid rural–urban migration. And in addition to policies, some Asian countries, such as India, may have experienced slower internal migration because of structural barriers, such as the extra costs of migration imposed by ethnolinguistic diversity, or because of strong ties to social and caste networks, which provide mutual insurance to their members (Munshi and Rosenzweig 2005).

Diminishing Returns in Asian Agriculture

Asia's Green Revolution began over four decades ago, and in almost all instances it resulted in rapid growth in yields over a number of years. Maintaining high growth rates has proved increasingly difficult, however, such that yield growth in key staples has declined from 2–3 percent per year in the 1970s to around 1 percent per year in the past decade or so (World Bank 2008). This decline in yields is partly the result of inevitable technological barriers, but it is also due to policy mistakes that have encouraged the wasteful use of fertilizer, electricity, and irrigation. Large areas of China and India maintain irrigation systems based on unsustainable extractions of water from rivers or the ground: the ground water overdraft rate is estimated to exceed 25 percent in China and 56 percent in India's northwest breadbasket, and absolute water scarcity is thought to affect over 850 million people in developing Asia (IWMI and Earthscan 2007).

An additional constraint is farm size. Principally because of rural population growth, average farm sizes in Asia are shrinking markedly (Table 3). Between 1971 and 1995/96, they fell from an average of 2.3 to 1.4 hectares in India, from 5.3 to 3.1 hectares in Pakistan, and from 1.3 to just 0.6 hectares in Bangladesh. Estimates under the present study indicate that there were roughly 340 million small farms in developing Asia by 2000.

Table 3. Changes in average farm size and number of small farms

Country	Census year	Average farm size (hectares)	Number of small farms (millions)
India	1971	2.3	49.11
	1991	1.6	84.48
	1995/96	1.4	92.82
Bangladesh	1977	1.3	
	1996	0.6	17.03
Nepal	1992	1.0	2.41
	2002	0.8	3.08
Pakistan	1971–73	5.3	1.06
	1989	3.8	2.40
	2000	3.1	3.81
Indonesia	1973	1.1	12.71
	1993	0.9	17.27
Philippines	1971	3.6	0.96
	1991	2.2	3.00
Vietnam	2001	n.a.	10.13
Laos	1999	n.a.	0.49
Myanmar	1993	n.a.	1.66
Thailand	1978	3.6	
	1993	2.9	1.86
China	1980	0.6	
	1990	0.4	
	1997		189.38
	1999	0.4	
Total	Circa 2000		340.53

Source: The majority of the data are from Nagayets (2005); much of the data on the number of small farms are from Anriquez and Bonomi (2007).
Notes: The definition of a small farm is an area of 2 hectares for all countries except Thailand, where Anriquez and Bonomi (2007) define them as having an area of less than 1.6 hectares. “n.a.” signifies non-availability of data.

Whether these smallholders are microeconomically inefficient has been the subject of perpetual debate since Berry and Cline (1979), if not earlier. Reviews of the issue by Fan and Chan-Kang (2005) and Anriquez and Bonomi (2007) suggests that smallholder productivity varies across regions, by level of development, and based on how efficiency—that is, land productivity, labor productivity, and total factor productivity—is defined. What is not in dispute, however, is that the successful adoption of modern technologies by Asian smallholders has resulted in significant poverty reduction, an outcome that is difficult to envisage being achieved by allocating resources to large farms.

In any case, two more contemporary concerns must now enter this debate. The first is whether the economic viability of smallholders is declining because of the growth of agribusiness and globalization processes (Joshi, Gulati, and Cummings 2007). The second is whether Asian farm sizes are now declining to the point where they will be inefficient, even if they were not so in the past. Shrinking farm sizes may explain, for example, why the RNF sector appears to have been considerably more vibrant than the farm sector in many parts of rural India (Foster and Rosenzweig 2004).

Persistent Rural Poverty and Rising Rural–Urban Inequality

Despite a history of high agricultural growth rates and rural income diversification, Asia is still characterized by large numbers of people who have not significantly benefited from rapid economic growth (Fan and Hazell 2001). The poorest of the poor are often concentrated in geographically adverse regions (for example, isolated mountainous regions in eastern India, western China, northern Thailand, and Vietnam), in tribal regions or among low caste groups, and in areas with particularly poor governance or political instability (for example, India's Bihar state). Absolute numbers of poor people are also a significant problem in Asia, especially in rural areas. While China made great strides in reducing rural poverty in the 1980s, absolute numbers of poor people have remained stubbornly high in many other parts of Asia (see World Bank 2008) and may even have increased in India during the 1990s (Deaton and Kozel 2005).

Part of the rising inequality may be connected to the feminization and aging of rural labor forces (Buvinic, Gwin, and Bates 1996; Mehra and Gammage 1999), which may impede labor force mobility. But this is still uncertain because solid evidence of the feminization of the agricultural labor force to date is scarce. De Brauw's (2002) empirical study for China actually finds the opposite: the proportion of farm work being done by women was declining in the late 1990s, and the future feminization of agriculture in China is judged unlikely. Anriquez and Bonomi (2007) collate data from various agricultural census and find that feminization of the rural labor force is only a concern in Africa, and that rural aging issues are not of pervasive concern in any country in their sample. However, that sample did not include China, where increasing numbers of older rural people are being left behind by economic growth (Benjamin, Brandt, and Giles forthcoming).

Somewhat surprisingly, however, rural–urban inequality shows no signs of having systematically increased in Asia (Eastwood and Lipton 2004), although spatial inequality has risen markedly in China, India, and Indonesia (Milanovic 2005), again reinforcing the importance of lagging regions. China is a significant case in that both spatial inequality and rural–urban inequality have been rising rapidly. In China, rural–urban inequality was relatively high in the pre-1978 period (especially given that overall inequality was very low), but it decreased markedly during the period of major agricultural reform in the early 1980s (involving the household responsibility system and the dual track price mechanism). However, from 1985 to 1999 China's income distribution changed along a number of different dimensions: rural–urban inequality increased back to its 1978 level, spatial inequality rose markedly (Kanbur and Zhang 2005; Milanovic 2005), and overall income inequality rose from an admittedly very low Gini coefficient of 0.22 in 1978 to a relatively high 0.45 in 2003 (Chotikapanich, Rao, and Tang 2005). China's structural features are unlike other Asian countries, with the exception of Vietnam, so it is not clear that the rest of developing Asia is as vulnerable to rising inequality as China. Nevertheless, China's experience demonstrates some of the costs of restrictive migration policies and spatially biased reform strategies (Kanbur and Zhang 1999), which have brought rapid growth at the cost of rising inequality.

The Threat of Jobless Growth

The aforementioned factors suggest that Asia's agricultural sector will still need to shed many more agricultural workers in the years to come. A preliminary sign of that problem is that output-employment elasticities (OEEs) in Asian agriculture have declined over much of the 1990s (Bhalla and Hazell 2003; Bhattacharya and Sakthivel 2004; and Khan 2007). Ultimately, the greatest challenge for Asia's vast population will be creating enough nonagricultural jobs, and at a fast enough rate. Recent evidence suggests that the labor intensity of manufacturing growth is declining over most of Asia, including China and India, Asia's largest countries. Khan's (2007) comprehensive review of a series of country studies on employment and output growth by the United Nations Development Programme is summarized in Table 4. These studies confirm a tendency toward declining employment intensity in agriculture, but they also suggest declining employment intensities in manufacturing. In India, capital-biased industrial policies and prohibitive labor regulations have lead to an economic structure ill-suited to India's labor abundance

(Besley and Burgess 2002 and Kochhar et al. 2006). China's story is more complex as it partly relates to the varying fortunes of China's town and village enterprises—which were a source of significant labor absorption in the 1980s before credit constraint slowed their growth—and partly to the gradual shedding of surplus labor from state-owned enterprises (Khan 2007). More recently, rural–urban migration in China looked set to increase pressure on nonagricultural labor markets. Between 1999 and 2003, the number of internal migrants in China roughly doubled, from 52 to 98 million, and China's 2000 census suggests annual migration rates of 8.5 percent of the workforce, with roughly 30 percent heading to local townships, 30 percent to other counties in the same province, and 40 percent to other provinces (Du, Park, and Wang 2005).

Table 4. Trends in output-employment elasticities in seven Asian countries

Country	Trend
China	Agriculture started shedding labor from the early 1990s, but this was reversed for a period starting in 1997. Industries and services experienced sharply falling output-employment elasticities (OEEs). Overall employment performance has been poor. The problem essentially appears to be one of poor management of the transition.
Indonesia	Employment performance was good prior to the crisis. OEE in manufacturing fell sharply in the recovery period. There was a reversal of the long-term reduction in agriculture's share of employment. On balance, employment performance has been poor in the recovery period.
Malaysia	OEEs have shown no trend reduction. Growth has been employment friendly overall.
The Philippines	Estimates of employment intensity in the available case study are inadequate to arrive at a firm judgment, although it appears from findings of other studies that there were institutional obstacles to labor absorption in agriculture and manufacturing.
Thailand	OEEs were higher for the nonagricultural sectors in the 1990s (until 1996) than in the 1980sm but the overall OEE was lower, because agriculture's OEE turned from a positive value in the 1980s to a highly negative value in the 1990s. In the recovery period the OEE for manufacturing fell somewhat but rose for construction and services. The Lewis transition in agriculture of the 1990s was reversed.
India	In the postreform period the OEEs fell, and employment growth fell compared with the prereform period. But real wages rose, presumably due to a supply-induced tightening of the labor market.
Sri Lanka	With the exception of a few subsectors of industries and services, OEEs were reasonably high, and growth was employment intensive.

Source: Adapted from Khan (2007).

To summarize, most of developing Asia has achieved remarkable feats of growth and poverty reduction with relatively little urbanization, largely through a combination of rapid agricultural growth and spatially dispersed industrial growth. However, the potential of Asian agriculture to keep people on the land has diminished markedly in recent decades, and there are justified concerns that the sheer number of jobs that need to be created outside of Asia's agricultural sector will impose a daunting challenge on the region. Such challenges would be large for any economy, but they are now magnified because the same problem is emerging simultaneously for a number of very populous Asian countries. Previous research has attempted to assess the implications of cheap and abundant Asian labor on labor markets in other regions of the world, such as Latin America (Wood 1997). But one might also ask whether large Asian countries will also experience lower employment growth as a result of increased competition from each other (that is, in export markets). Indeed, the results reviewed by Khan (2007) suggest that Asian labor markets are already tightening, perhaps for this very reason. Simulations presented in the next section also suggest that many Asian countries will struggle to achieve full employment growth paths

unless they can achieve faster growth in agriculture and more labor-intensive growth throughout the economy.

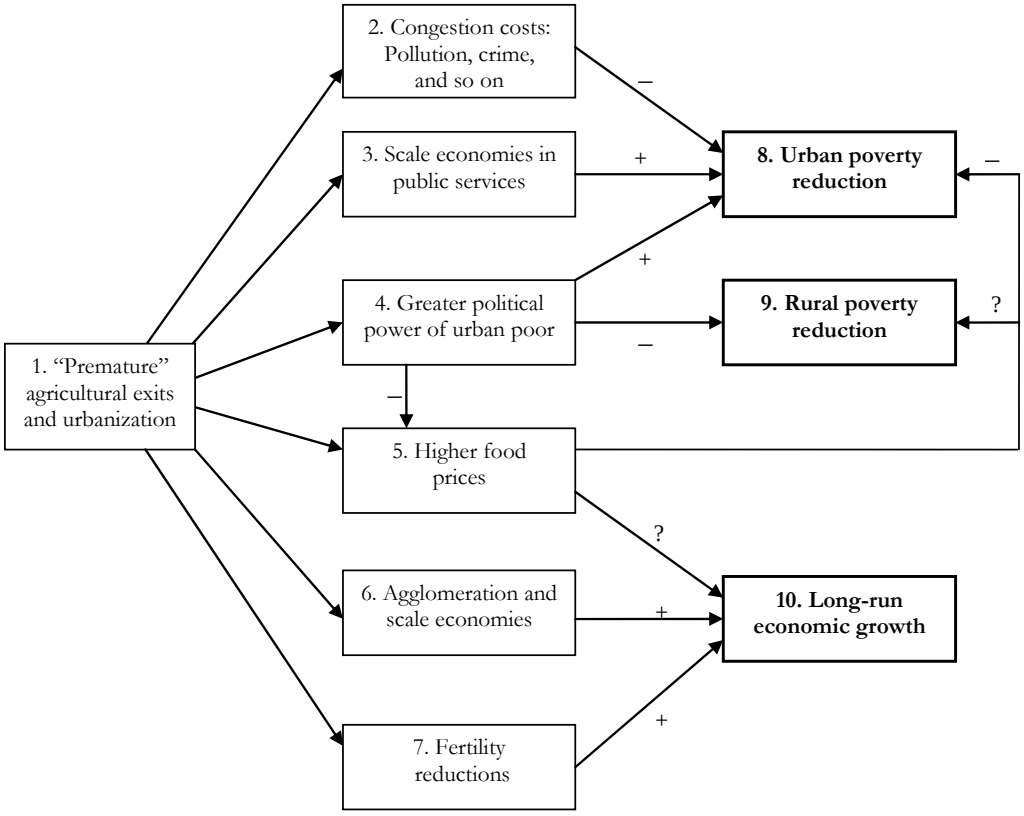
An obvious caveat to this concern is that supply begets its own demand. In other words, population and income growth in Asia may add to the supply of labor, but these forces also increase the demand for labor. This is true to some extent, but demand for Asian exports is not infinite, and the least developed Asian countries are facing a challenge that previous Asian "Tigers" did not encounter. Japan, South Korea, Taiwan, and Malaysia all tended to grow in sequential phases and with quite complementary shifts in economic structures (the so called flying geese phenomenon), and among them only Japan could truly be called populous by Asian standards. In contrast, developing Asia is now characterized by a large number of countries—China, India, Indonesia, Pakistan, Vietnam, Bangladesh—that are highly populous, at similar stages of development, and all in need of significant job creation outside of agriculture.

5. EARLY AGRICULTURAL EXITS IN AFRICA: PROBLEM OR SOLUTION?

Africa's agricultural exit problem is very different to that of Asia's. As was observed in Section 2, African development paths have often been characterized by rapid urbanization, even in the absence of income growth. While this is not a phenomenon that characterizes all African economies, many African cities are growing extremely quickly; poverty appears to be urbanizing in much of Africa; and the continent's most populous country, Nigeria, has urbanized the fastest, despite negative economic growth. But whereas this development path has features that clearly reflect highly inefficient, urban-biased policies, it is also possible that urbanization is an effective coping strategy and even a source of new growth opportunities for Africa. This section therefore offers an assessment of some of the likely costs and benefits of Africa's "over-urbanization."

Some of the mechanisms by which early agricultural exits—and urbanization, in particular—might influence both long-run economic growth and rural/urban poverty reduction are outlined in Figure 5, based on a reading of a range of different literatures on economic growth, sectoral linkages, the political economy of food policies, migration, service delivery, and poverty reduction.[12] Arrows indicate directions of causation; positive/negative signs indicate whether the transmission mechanism has positive or negative effects on development outcomes; and a question mark indicates that the sign of the effect is theoretically ambiguous. The boxes within the figure are numbered to facilitate the discussion that follows below.

Figure 5. "Premature" agriculture exits: A model of potential costs and benefits



Source: Devised by authors.

[12] While the focus is a particular backwash effect on rural poverty reduction (food prices), some other potentially important effects have been omitted, including rural brain drain, as well as positive productivity effects associated with the release of surplus rural labor (in the Lewis 1954 tradition). These omissions are largely due to a lack of cross-country data on their effects.

The Congestion Costs of Early Agricultural Exits: Unemployment, Informality, and Slum-Living (Figure 5, Boxes 1, 2, and 8)

Most of the literature examining urbanization without growth, and especially agricultural growth, has justifiably been concerned with the employment burden on the nonagricultural sector. This is a difficult issue to tackle empirically, because statistics on urban unemployment lack relevance in economies where underemployment and informal employment are more important concepts—though scarcely amenable to adequate measurement. Nevertheless, some basic "back of the envelope" calculations can shed light on how rapid agricultural exits influence different economies.[13] To that end we run simulations to estimate the kind of sectoral growth rates that would be required to achieve full employment of labor under different scenarios. Specifically, we assume a two-sector economy of agriculture (A) and nonagriculture (N). By definition, annual growth in employment (gE) is a function of annual growth rates in agricultural output (gA) and nonagriculture output (gN), the initial employment shares of the two sectors (sA, sN), and their (full) employment elasticities with respect to output (εA, εN). Rearranging this identity, we can derive the nonagricultural growth required to achieve full employment based on three key characteristics of the economy: (1) the relative labor intensities of agriculture and nonagriculture; (2) the share of agricultural employment; and (3) the agricultural growth rate. The nonagricultural growth rate needed to achieve full employment is then given by:

$$g^N = \frac{(g^t - s^A \varepsilon^A g^A)}{s^N \varepsilon^N} \quad (1)$$

In the first scenario, we examine what rates of nonagricultural growth would be required to maintain full employment at different rates of agricultural growth for different agricultural employment shares. We begin by assuming that total employment growth is 2.9 percent per year, which we base on average figures for developing countries in the 1990s. Following Hazell and Diao (2005), we then assume that agriculture's employment elasticity (the responsiveness of agricultural employment to agricultural growth) is around 0.5, and that nonagriculture's employment elasticity is lower, at 0.3—that is, we assume agriculture is somewhat more labor-intensive than nonagriculture. Given these assumptions, we can then use to Equation (1) to calculate the required rate of nonagricultural growth for given rates of agricultural growth and different agricultural employment shares (Figure 6a).

The gradient of the required nonagricultural growth line declines markedly as agriculture's share in the initial labor force declines (Figure 6a). A country with just 30 percent of its labor force in agriculture (for example, Brazil in 1980) requires a relatively feasible nonagricultural GDP growth rates of 10–15 percent (depending on the comparable agricultural growth rate) in order to ensure full employment. But in economies in which the share of the agricultural labor force is much higher—that is, 50 to 70 percent—the agricultural growth rate is much more critical, precisely because the required nonagricultural growth rate is daunting. Even a 2-percent agricultural growth rate in a 50-percent agricultural labor force would require 16-percent growth in nonagricultural GDP. At a 70-percent share for the agricultural labor force (the typical African scenario), the calculus suggests that nonagricultural growth alone cannot feasibly shoulder the burden of low agricultural growth rates. In contrast, experiences like China's in the 1980s—where agricultural growth grew at 6 percent per year—demonstrate the vital importance of rapid agricultural growth rates in creating employment at early stages of development.[14]

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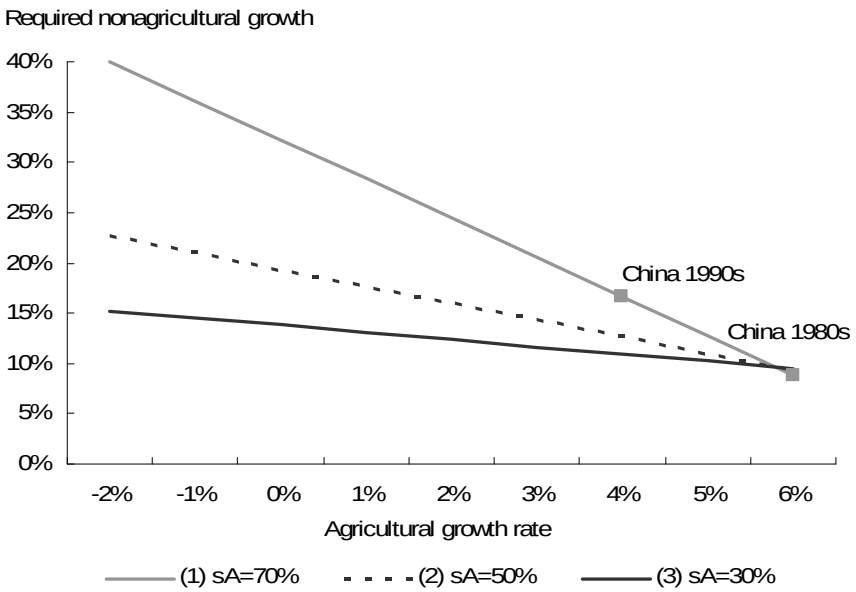
[13] See Bhalla and Hazell (2003) for a similar analysis of the agricultural exit burden in India.

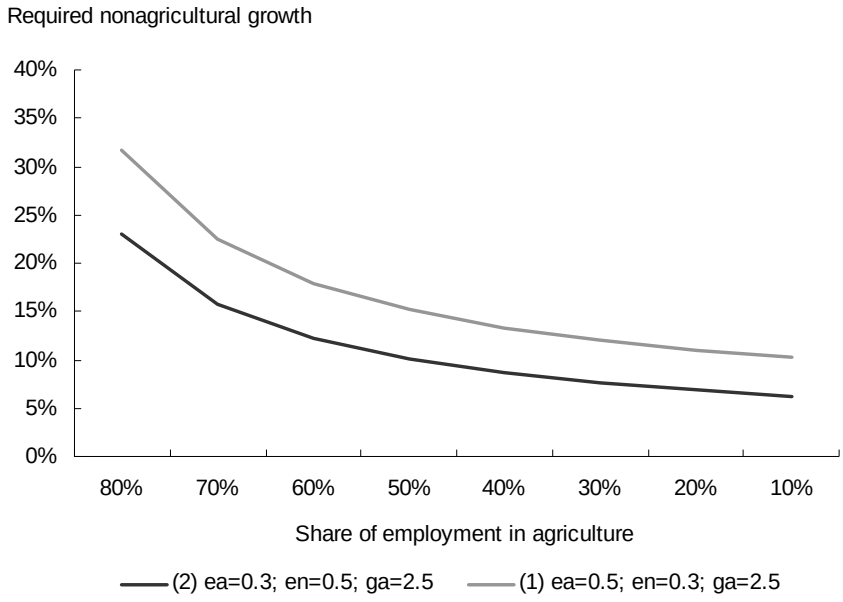
[14] China had exceptionally high agricultural growth rates in the 1980s, so much so that our analysis suggests that nonagricultural GDP was required to grow by around 10 percent to achieve full employment—which it roughly did. By 1990, China's agricultural labor force share had decline only markedly, but its agricultural growth decelerated to around 4 percent. This dramatically raised the required nonagricultural full employment growth rate to around 17 percent. Extraordinarily, China's official nonagricultural growth rate actually increased to around this level, suggesting that China has more or less pursued a full employment growth path by "walking with both legs."

Figure 6. Simulating full employment nonagricultural growth rates under alternative scenarios

6a. How full employment nonagricultural growth rates vary with agricultural growth rates



6b. How full employment nonagricultural growth rates vary with agricultural growth rates vary with employment shares



Sources: Calculated by authors.
Notes: S_A is the initial share of agricultural labor in the workforce. Labor-intensive growth for a sector means that the elasticity of employment with respect to growth has been set at a higher level in that sector than in the other sector (0.5 compared with 0.3).

Nevertheless, it is quite possible that nonagricultural sectors could be more labor intensive than agriculture, especially in individual countries. The effect of switching to this labor-intensive nonagricultural growth scenario for a "healthy" agricultural growth rate of 2.5 percent per year (Figure 6b). This figure is also valuable because it enables the nonagricultural growth path to full employment to be tracked for a hypothetical country as it undergoes structural change. The grey line shows this development path under the assumption of greater labor intensity in agriculture, while the black line

shows the path under the assumption of greater labor intensity in nonagriculture. These assumptions are certainly important. For example, at a 70-percent share for the agricultural labor force, the nonagricultural growth rate needed to achieve full-employment drops from 22.5 to around 16 percent per year. This highlights the importance of more labor-intensive production technologies in either sector (unless such technologies substantially reduce the overall growth rate). But the earlier conclusion that agricultural growth is exceptionally important at early stages of development is still evident in Figure 6b: even if manufacturing is the relatively more labor intensive of the two sectors, fast agricultural growth at early stages of development is still a prerequisite for lowering the burden of growth in the nonagricultural sector. Nevertheless, lower labor intensities, as well as lower agricultural growth rates, might offer some explanation as to why Africans continue to leave agriculture despite low growth rates in both sectors of their economies.

What are the implications of these calculations? Countries with large initial agricultural population, high rates of agricultural exits, and low growth rates in both agriculture and nonagriculture simply cannot avoid rising unemployment. Instead, unemployed, underemployed, and informal workers are hidden in both the agricultural and nonagricultural economies, and many workers migrate overseas if the opportunity presents itself. Lack of formal employment in urban sectors presents other problems, such as high rates of crime and poor quality housing. Davis (2007) estimates that slum-dwellers comprise nearly 80 percent of Nigeria's urban population (some 41.6 million people) and 56 percent of India's population (158.4 million).[15] How this massive boom in the informal economy influences economic development is discussed in the concluding section of this paper.

Structural Change and Food Security (Figure 5, Boxes 1, 5, 8, and 9)

In the Lewis (1954) and Ranis and Fei (1961) models, the food price is critical because it significantly determines the real wages of unskilled nonagricultural laborers, a group that typically spends a large portion of their individual budgets on food. In Lewis' model, agricultural have no significant effect on food supply until the exits exhaust agriculture's surplus labor. Whether underdeveloped agriculture is really characterized by surplus labor is an old debate (see Sen 1967, for example). If agricultural labor is not in surplus, then agricultural exits may reduce food supply, thereby putting upward pressure on food prices. In an open food market, however, rising food prices can be mitigated by food imports or food aid. But unless a developing country has a strong comparative advantage in exports and a plentiful supply of foreign exchange, a rising food deficit can become a significant inefficiency.[16] Moreover, whereas food in general is tradable, foods specific to local diets may not be tradable (Delgado 1992), and the tradability of food may be limited by high transactions costs (for example, poor transport infrastructure). Even if an economy is not characterized by surplus agricultural labor or sufficient foreign exchange, rising food prices may not be a problem if they induce a positive agricultural supply response. However, such a response might be unlikely in economies that are urbanizing without growth and have a history of underinvestment in agriculture. Indeed, the cross-country literature on agricultural supply response has provided evidence that low levels of infrastructure and appreciated exchange rates (which may act as a tax on agriculture) can significantly inhibit agricultural supply response (Schiff and Montenegro 1997).

Unfortunately these predominantly theoretical issues on urbanization and food prices have not been much enlightened by careful empirical work on the effect of early urbanization on food prices. Retail food prices are higher in urban areas than they are in rural areas,[17] however, and rapid urbanization

[15] Of course, even slums need to viewed in their proper context. Slums are not necessarily worse than the alternative of poor rural living conditions, which are isolated, dispersed, and hidden from the international observers. Moreover, despite their appearance of chaos, careful studies of slums show that they usually have social hierarchies, entrepreneurial commerce, and even a degree of home-grown government (de Soto 2000; Neuwirth 2005).

[16] If exports induce Dutch Disease effects—as is sometimes the case is natural resource economies—this can also increase the price of food imports.

[17] Price levels in urban areas generally exceed those of rural areas by 20 percent or more, although this may be much higher in some countries, and significantly higher for the poor. Although Ravallion, Chen, and Sangraula (2007) do not look at food

has even been attributed as one of the factors leading to the 2007/08 surge in global food prices (von Braun 2007). To give some very preliminary insights into whether there might be some causal association between premature urbanization and higher retail food prices, Appendix D provides econometric tests of whether urbanization rates share significant (partial) associations with a food price consumption index produced from the latest International Comparison Program (ICP) data, as well as FAO-derived data on food deficits. Controlling for income levels, exchange rate distortions, oil production, and regional effects, we find that the elasticity of food prices with respect to urbanization levels is about 0.20, while the analogous elasticity for food deficits is about 0.28. These are sizeable effects, but the causality of these associations is not yet rigorously established, and careful time-series work is required to validate these preliminary findings. Moreover, while food prices may be higher in more urbanized countries, food security may also be greater in these countries because poor urban people have much greater physical access to food supply than do rural populations in extremely isolated areas, such as eastern Ethiopia, a region perpetually threatened by famine.

The Political Economy of Urbanization (Figure 5, Boxes 1, 4, and 5)

Binswanger and Deininger (1997), following Olson (1971), suggest that the ability of the urban poor to influence policy outcomes is supported by the low transaction costs of forming cohesive political groups[18] in agglomerated areas, while the effectiveness of urban groups is enhanced by their proximity to centers of political power. Unsurprisingly, then, least developed country (LDC) policymakers are generally more concerned by urban uprisings that rural discontentment (Lipton 1977). Whether the effects of urbanization on the empowerment of the poor improve overall poverty reduction is questionable, however. De Soto (2000) argues that the urbanization of Peru's poor populations has greatly boosted their empowerment and sparked a quiet revolution there. But while urbanization might empower the urban poor, it may hurt the rural poor. Policies that reduce the cost of food prices are an obvious example, including price controls, export barriers, and consumption subsidies, all of which tend to amount to direct or indirect taxation of food producers. In the current global food crisis, beginning in late 2007, this chain of events has been playing out once again, even in countries that stand to benefit from rising international prices, such as Vietnam. Moreover, these kinds of policies may benefit short-term poverty alleviation in cities, but it is far less clear that they are good for growth. Unless export tax revenue is profitably reinvested, export taxes reduce output, directly and indirectly, by restricting farmers' incentives to produce. Consumption subsidies and price controls are also extremely costly and detract from investment spending (Egypt's well-known food subsidies amounted to 14 percent of total government spending after the subsidies were increased in response to the 1977 food riots [Lofgren and El-Said 2001]). Thus the overall welfare effects of the greater empowerment of the urban poor are ambiguous.

Agglomeration Economies of Public Service Provision (Figure 5, Boxes 1, 3, and 8)

Another manifestation of the greater political empowerment of the urban poor could be urban biases in the allocation of public resources between rural and urban areas, specifically in areas such as roads, water supply, sanitation, housing, health, and education. However, differences between urban and rural service provision could also be due to agglomeration economies in public service provision associated with greater population density and lower transaction costs. Simon (1992), for example, documents higher rates of return to investments in high density areas, but very little other work has systematically tested differing rates of return between comparable rural and urban investments.

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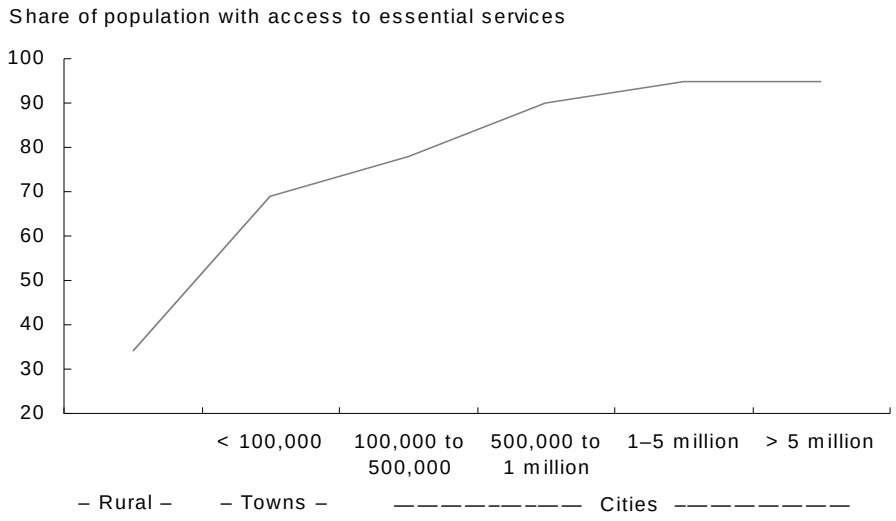
prices specifically, their results do indicate that urban poverty lines are generally much higher than rural poverty lines (by 26 percent on average), and in some countries they are even 70–80 percent higher.

[18] Urbanization may break down more than just geographical barriers to group formation; social and ethnic differences may also be less important in urban slums (although racial tensions are also prominent in some developing cities).

To shed some light on this issue, Figure 7 presents Hewett and Montgomery's (2001) data on the proportion of a population with access to three essential services: electricity, safe water, and sanitation. These data are grouped by agglomeration sizes ranging from rural towns all the way up to cities with more than 5 million inhabitants. As agglomeration increases, service provision increases substantially, albeit subject to strong diminishing marginal returns (once a city reaches 1 million people there are no extra increases in access to services). Brockerhoff and Brennan (1998) find very similar evidence, suggesting that positive but diminishing returns to city size is a fairly robust stylized fact.

Figure 7. Evidence of agglomeration economies in least developed country cities?



Source: Devised by authors based on data from Hewett and Montgomery (2001).
Notes: Essential services include electricity supply (yes/no), adequate access to drinking water, and access to a functioning flush toilet. See Hewett and Montgomery (2001) for further details on the data and country coverage.

Unfortunately, it cannot decisively be inferred from this evidence that agglomeration externalities explain urban service provision, because diminishing returns to city size could also be the result of institutional factors. In particular, the political power of urban groups may increase with city size, as may a city's wealth and access to public resources. Another caveat is that, while there are economies of scale in service provision, the sheer size and speed of urbanization imposes a daunting financial bill on both local and municipal governments (Richardson 1987). Moreover, much of the literature of the 1980s and 1990s has become increasingly concerned that high rates of population growth in LDC cities have been directly contributing to the urbanization of poverty. Brockerhoff and Brennan (1998) provide a review of this literature, but they also test whether city population growth rates significantly explain city-level infant mortality trends. They find that long-term city growth rates in excess of 5 percent a year have unfavorable effects, raising infant mortality odds by 24 percent in North Africa and Asia, by 28 percent in Latin America and the Caribbean, and by 42 percent in tropical Africa. Moreover, even moderate growth of 3–5 percent per year has similarly adverse results in Sub-Saharan Africa. This is another piece of evidence indicating that, although population densities seem to yield an advantage to urban areas in terms of public service delivery, there are rapidly diminishing returns to this advantage and potentially little or no advantage in the short run, especially in Africa.

Agglomeration Economies and Growth (Figure 5, Boxes 1, 6, and 10)

Since the emergence of the New Growth Theory, economists have focused much greater attention on the ways in which endogenous growth processes induce economies of scale and technological change. A major strand of this literature, introduced by Krugman (1991), focuses on the positive externalities

associated with the agglomeration of firms, workers, and consumers. Recent theory and evidence on agglomeration externalities is well reviewed by Henderson (2003) and Quigley (2007). These authors identify several key channels through which agglomerations influence economic growth: lower transport and transaction costs, economies of scale and scope (decreased covariance of shocks, greater stability in income and employment, economies of density), economic specialization, and technology spillovers. Duranton (2007) and Henderson (2003) find cross-country evidence that appropriate levels of agglomeration have significant positive impacts on growth,[19] but—consistent with the findings of Brockerhoff and Brennan (1998) discussed above—as development proceeds, excessive urban primacy becomes costly.[20]

One problem with the cross-country literature on agglomeration externalities is that it appears to be difficult to discern whether the population size of large cities that what matters or their share in the total population ("urban primacy"). Appendix C revisits these issues by testing cross-country effects of urbanization and agglomeration effects for the period 1970–2001. It was generally not possible to distinguish between the effects of absolute city size and the effects of urban primacy, which suggests that Henderson's (2003) results may not be very robust. Moreover, although we found positive effects of large cities, we found negative effects of urbanization as a whole. This may suggest that agglomeration externalities are indeed good for growth, but many other urbanization effects (of the kinds described above) are a constraint on growth. An equally important caveat to studies such as Henderson's (2003) is that they do not provide much of an idea as to the precise channels through with urban agglomerations influence growth. There are at least four different economic channels by which agglomerations could influence growth, and politico-institutional factors may also explain these results. Future research needs to pin down which channels matter most.

Urbanization and Fertility Reductions (Figure 5, Boxes 1, 7, and 10)

Relative to their rural counterparts, urban households are more likely to have (1) adult women who work outside of their residence, thus increasing the opportunity costs of in-house childcare; (2) better knowledge of and access to family planning technologies; (3) less need for in-household labor; and (4) less volatile incomes, thus limiting the need to have large families as a source of income diversification. (Gille 1985; Singh, Casterline, and Cleland 1985; Schultz 1993; and Ainsworth et al. 1996). All these factors seem to explain the widely observed stylized fact that fertility rates are lower in urban areas of developing countries, thus allowing the possibility that urbanization could have an impact on growth and poverty reduction by reducing age dependency ratios (see Kelley and Schmidt 2003 for a review of the channels through which fertility reduction influences growth).

The association between urbanization and fertility is far from uniform in magnitude, however, and sometimes even in direction. Urban–rural fertility differentials are most pronounced in countries that have made some progress in development, but sometimes these differentials are insignificant, or even reversed, in nations at early stages of development. Therefore, further urbanization would be expected to contribute to fertility reduction in countries that are already quite urbanized, such as those in Latin America and East Asia, but the impacts may not be very large in Sub-Saharan Africa (Laidlaw and Stockwell 1979). These are hardly robust stylized facts, however. Dudley and Pillet (1998) find that the rural–urban fertility gap in Africa increased from 1.1 births in 1979–80, to 1.5 births in 1988, and to 2.4 births in 1993—and many studies probably underestimate the impact of urbanization on fertility reduction

[19] Considerable country-specific evidence also exists on agglomeration effects; that evidence is not reviewed here, however, because much of it relates to developed countries, and much of it suffers from selection bias toward large, population-dense countries with sufficient firm-level data. For example, Quigley's (2007) review focuses on evidence from China, India, Brazil, South Korea and Indonesia.

[20] A 33-percent increase or decrease in primacy from a typical best level of 0.3 is predicted to reduce productivity growth by 3 percent over five years. A related literature also discusses the political economy of why countries might veer toward excessive primacy, particularly the roles of democratization and fiscal decentralization (see Henderson 2005; Quigley 2007; and Duranton 2007).

because they also specify female and male education variables. If urbanization contributes to declining fertility via education as well as via other channels, then controlling for education implies that the total effect of urbanization on fertility reduction may be underestimated.

We test these conjectures with some cross-country regressions of crude fertility rates against urbanization, with and without other variables that capture the demand for children (Schultz 1997), including GDP per capita, years of schooling among female and male adults, and infant mortality (Table 5). In all regressions we use fixed-country and period effects, and we test a full sample of LDCs, as well as a Sub-Saharan African sample. We also switch between using urban population shares (Regressions 1 through 4) and nonagricultural employment shares (Regressions 5 through 8). With fixed effects but no other controls, a 10-percentage-point increase in the urban/nonagricultural population shares has a large and significant negative effect on fertility rates (–0.33 and –0.61, respectively). However, when we add control variables, these effects diminish by about a third and become statistically insignificant in the case of urban population shares. Moreover, the effects are much smaller in Africa even without controls, and they disappear altogether when controls are added.

This evidence tends to confirm some of the aforementioned microeconomic evidence suggesting that urbanization has a rather muted effect on fertility rates when it is not accompanied by economic growth or significant improvements in female education. As to the effect of fertility reductions on growth, most evidence—especially since 1980—suggests that lower fertility rates and demographic transitions can make substantial contributions to economic growth, especially in conjunction with labor-intensive growth strategies (Kelley and Schmidt 2003).

Table 5. Testing the relationship between fertility rates and urbanization

	Regression No. 1	**Regression No. 2**	**Regression No. 3**	**Regression No. 4**	**Regression No. 5**	**Regression No. 6**	**Regression No. 7**	**Regression No. 8**
Marginal effects	**All LDCs**	**All LDCs**	**SSA only**	**SSA only**	**All LDCs**	**All LDCs**	**SSA only**	**SSA only**
Of increasing urban population share by 10 points	–0.30***	–0.18	–0.20*	0.02				
Of increasing nonagricultural population share by 10 points					–0.61***	–0.40***	–0.27**	0.29
Of increasing GDP per capita by $1,000		–0.13**		–0.17**		–0.003		–0.18*
Of increasing female schooling by one year		–0.73***		–0.53**		–0.55***		–0.78***
Of increasing male schooling by one year		0.23**		0.09		0.18*		0.14
Of decreasing under five year old mortality rate by 100 children per 1,000		–0.70***		0.04		–0.23		0.06
Number of countries/observations	82/324	62/208	36/143	24/82	81/293	62/208	35/127	24/74
Estimator				Fixed effects				
Dependent variable				Fertility				
Adjusted R-squared	0.82	0.92	0.75	0.86	0.87	0.92	0.76	0.93

Source: Calculated by authors.

Notes: LDCs indicates least-developed countries; SSA, Sub-Saharan Africa. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. Data are structured as decadal panel for the years 1960, 1970, 1980 and 1990.

In summary, the purpose of the analysis in this Section was to distinguish between over-urbanization as a symptom of existing problems, and over-urbanization as a cause of new problems—but also of new possibilities. Rural–urban migration is clearly an effective survival strategy for many of the rural poor, but the effects of this microeconomic rationality on the macroeconomy are unclear. Unemployment, informality, congestion problems, food-price inflation, and the persistence of urban-biased policies are all potential obstacles to future growth and poverty reduction that may be induced by over-urbanization. But agglomeration externalities in the production of both private and public goods may provide sufficient momentum to propel "over-urbanized" economies onto a more positive growth path. However, there are two highly significant caveats that must be attached to the agglomeration arguments. First, good urban governance surely makes a large if not decisive difference in whether agglomeration externalities can be successfully utilized, especially in terms of the public provision of infrastructure, education, and food policies. Second, the lesson for African countries that are not yet highly urbanized is that excessively fast urbanization should still be avoided, especially in those African countries that have considerable agricultural potential.

6. DEVELOPMENT STRATEGIES IN OVER- AND UNDER-URBANIZING ECONOMIES

This paper has identified a startling divergence in the economic growth and agricultural exit paths of developing countries. While faster economic growth is traditionally accompanied by faster agricultural exit rates, fast-growing East Asian countries have generally only experienced modest agricultural exit rates. Slow-growing Africa, in contrast, has often undergone surprisingly fast agricultural exits, and in some oil-rich countries—Nigeria, Cameroon, Gabon—extremely fast exits. This marked divergence between Asia and Africa is explained by the union of several factors: urban-biased policies and differing geographic and demographic conditions. The implications of these agricultural exit patterns are no less nuanced and often not well understood, especially in an empirical sense. With these considerations in mind, this concluding section focuses on some of the gaps in existing research, as well as on the important policy agendas required to address these issues.

The Delayed Agricultural Exit in Asia

The most important task for Asia is to stimulate more rapid employment growth in nonagriculture. That being said, Asian agriculture still has considerable potential to generate more productive employment, provided that agricultural growth is targeted correctly so as to further reduce rural poverty and realign smallholder production to modern production systems.

Agriculture's role in Asia's development has been critical, and generally underacknowledged, to date. This region's remarkable transition from widespread food deficits in the 1960s to national food surpluses today was accompanied by an equally dramatic reduction in poverty—from one in two Asians in 1970 to one in four today. But the food situation in Asia today is paradoxical. On the one hand, there are many increasingly affluent Asians who are rapidly diversifying and enriching their diets. This has led to significant increases in demand for livestock products, fruits, vegetables, and vegetable oils, which in turn has led to rapid growth in demand for feed grains. Yet, despite this growing food affluence for many, about 800 million Asians still live in abject poverty, hunger and malnourishment are surprisingly persistent, and 120 million preschool children remain underfed. These people desperately need better livelihood opportunities.

Although the scale of these challenges is daunting, there are favorable opportunities for agricultural growth through greater diversification of Asian agriculture to meet the changing food consumption patterns of the region's more affluent populations. Markets for horticultural and livestock products and feed grains are growing rapidly, and trade liberalization will enable more farmers to participate in supplying these markets. But raising the competitiveness of smallholders requires investments in rural infrastructure and technology (roads, transport, electricity, improved varieties, disease control, and so on) and improvements in marketing and distribution systems (including refrigeration, communications, food processing and storage systems and food safety regulations) for higher value, perishable foods (Rosegrant and Hazell 2000).

Agricultural growth of this type can make important contributions to incomes and poverty reduction in rural Asia. Yet the key lesson of the Green Revolution is that, if left to market forces alone, many poorer regions and poor people are likely to be left behind in modernization processes (Rosegrant and Hazell 2000). Because most of those left behind are likely to be small-scale farmers, avoiding this scenario requires strong and well-targeted public interventions that help small-scale producers capture a part of growing markets (Fan and Chan-Kang 2005). Agricultural research must also give adequate attention to the problems of smaller farms, and smallholders must be organized more effectively for efficient marketing and input supply.

Greater investments are especially important in the long-term development of the less-favored areas, where many of the rural poor live. Policymakers have been reluctant to do this in the past, preferring to rely on the "trickle down" benefits from investments in high-potential areas (increased employment, migration opportunities and cheaper food). This has proved insufficient: migration

opportunities are limited, and population pressures are likely to increase for at least a few more decades. Without adequate investments in basic infrastructure, technology, and human development, less-favored areas will not only stagnate economically but also suffer increasingly from environmental degradation. But with the right policies and investments, many less-favored areas could actually do quite well. Unlike crops, livestock and agroforestry can often prosper in zones with poor soils and climate, but farmers in these areas must have access to markets. Rapid economic growth in Asia is also creating new growth opportunities for nonfarm activity in many less-favored areas.

Even with realigned agricultural policies and increased food demand, the growth of small farms in Asia means that a large number of jobs will still need to be created outside agriculture to facilitate smooth agricultural exits. Asia's high population density means that the RNF sector may have a comparative advantage in employment creation because transaction and labor costs in rural Asia are generally low. But, despite its success, rural industry has probably not reached its potential in most of Asia. Policies that would facilitate further growth in the RNF economy include industrial policies aimed at encouraging more industry and services to locate in rural areas and medium-size towns (Mukherjee and Zhang 2007), education and training policies aimed at improving human capital in rural areas, deregulated labor markets that better facilitate new entrants (Besley and Burgess 2004), and improved land markets to facilitate the voluntary sale of small farms for both agricultural and nonagricultural use (Fan and Chan-Kang 2005; Haggblade et al. 2007a). In many Asian countries the kinds of policies that would achieve these objectives are simply not in place. The RNF sector often suffers from underinvestment because of policy biases toward large firms and urban areas. Rural health and education services are also neglected in much of Asia, even in fast growing economies such as China and India (World Bank 2003). And in China, it has been estimated that about 34 million farmers have lost land to involuntary land acquisitions in recent years (Zhang and Luo 2007).

Early Agricultural Exits in Africa: Poverty Trap or Nonagricultural Development Strategy?

Relatively little is known about how rapid urbanization in the absence of growth influences development. The scale of the problem in Africa is significant in population terms, solely on the basis of Nigeria's extraordinarily fast agricultural exit rate, but the trend is evident in most African countries. Furthermore, the discovery and development of significant mineral resources in a number of African countries suggests that there is a genuine possibility that Nigeria will not be exceptional. The challenges of rapid urbanization will be a bigger problem in Africa's future than they have been in the past.

African countries therefore need to learn some valuable lessons from more developed regions, especially East Asia (which has avoided excessive urbanization) and Latin America (which has already experienced excessive urbanization). The lesson from East Asia is that labor-intensive agricultural growth in egalitarian tenure systems is extremely propoor and can provide the foundations for successful nonfarm diversification (Bezemer and Headey 2008). Signs of optimism exist in African agriculture in this regard. Several countries have emphasized agricultural development strategies, and important region initiatives, such as the Comprehensive Africa Agriculture Development Programme (CAADP), have been established. Agricultural growth rates have generally accelerated across Africa since the early 1990s, and rising food prices are likely to at least slow the rate of agricultural exits. The question is whether African policymakers can sustain these impressive recent growth rates and use rising food prices to channel greater public resources into agricultural investments in the areas that matter most: R&D, irrigation and fertilizers, transport infrastructure, and market development (Kherallah et al. 2002; Fan, Chan-Kang, and Mukherjee 2005; and Fan 2008).

Yet, given the rising importance of nonagricultural factors in migration decisions—especially globalization and the development of new mining industries, Africa needs to develop nonagricultural development strategies as well. More effective macroeconomic management of natural resources is now high on economists' research agenda, but how the political economy effects of the natural resource curse

may be overcome is less well understood, as is the influence of natural resource development on agricultural outcomes and migration decisions.[21]

Other significant lessons for the development of nonagricultural growth strategies relate to the informal economy, which is large in Africa and seemingly growing very quickly. In this context, both Asia and Latin America offer useful lessons. De Soto's (2000) work on formalizing the informal economy is a case in point. De Soto (2000) argues that the binding constraint in rapidly urbanizing economies is the inability of poor people to use their considerable informal asset base to create productive capital. In East Asia, governments appear to have facilitated the formalization of the informal economy by creating better enabling environments for small businesses.

The central task for underdeveloped economies at risk of urbanizing too quickly is to increase the emphasis on reducing or eliminating sectoral biases brought about by both resource endowments (for example, the Dutch Disease effects of natural resources) and political dynamics (for example, biases against the rural sector or the informal economy). But apart from the political obstacles to balancing public resources, a more successful management of urbanization also requires more evidence-based policymaking. African policymakers still need more detailed knowledge about who migrates and why, and what impact rural–urban migration has on the migrants themselves and on the broader development prospects of the national economy. This paper has provided some broad insights into these questions, but significant knowledge gaps remain.

[21] See Collier (2007) for some proposals to increase transparency in the management of oil revenues. Bevan, Collier, and Gunning (1999) also emphasize the importance of channeling resources into rural and agricultural development—an important difference between Indonesia and Nigeria in the management of oil revenues.

APPENDIX A. ADDITIONAL DATA ON STRUCTURAL CHANGE AND ECONOMIC GROWTH

Table A.1. Urbanization and nonagricultural labor force trends, 1980–2001

Country	NALF (%) level, 1980	Urban (%) level, 1980	GDPPC level, 1980	NALF (%) change, 1980–2001	Urban (%) change, 1980–2001	GDPPC growth, 1980–2001
Algeria*	64.2	43.5	4,745	11.7	17.0	–0.3
Angola*	23.6	20.9	1,929	4.8	26.4	–0.9
Argentina	87.1	82.9	10,556	3.4	6.5	0.1
Benin	32.7	27.3	996	14.3	11.4	0.9
Bolivia*	47.2	45.5	3,046	8.9	16.8	–0.4
Brazil**	63.3	66.8	6,327	20.5	14.4	0.7
Burkina Faso	7.8	8.5	769	0.0	8.1	1.5
Burundi	7.1	4.3	756	2.6	4.6	–1.0
Cameroon**	26.9	31.4	2,125	14.8	19.0	–0.2
Central African Republic	15.3	35.1	1,793	12.9	3.8	–1.2
Chad	12.1	18.8	1,622	13.6	5.0	1.1
Colombia*	59.5	62.6	4,314	20.6	8.9	1.0
Congo, Democratic Republic of	28.4	29.0	714	8.9	1.6	–5.1
Congo, Republic of*	42.1	42.0	1,554	18.1	10.8	1.0
Costa Rica**	64.8	46.9	5,413	15.5	16.4	1.0
Cote d'Ivoire*	35.3	34.7	2,498	16.6	6.5	–2.2
Ecuador*	60.2	47.0	4,191	14.6	13.8	0.0
El Salvador**	56.4	44.1	4,160	15.3	14.6	–0.1
Ethiopia	11.1	10.5	641	2.0	4.7	0.4
Ghana	38.5	31.2	1,204	4.9	13.6	0.3
Guatemala	46.2	37.4	4,053	8.4	8.1	0.0
Guinea	9.1	19.1	2,584	7.4	7.7	1.4
Haiti	29.1	23.7	1,107	9.1	12.5	–2.1
Honduras*	42.8	34.9	2,272	26.4	9.9	–0.2
Hungary	81.6	56.9	8,151	8.1	0.7	1.3
Iran, Islamic Republic*	60.9	49.6	3,982	13.0	15.0	0.4
Jamaica	68.8	46.8	3,470	10.9	5.3	0.2
Jordan	82.2	60.2	4,051	6.7	20.9	0.4
Kenya	17.8	16.1	1,231	7.2	4.2	–0.1
Liberia*	23.4	35.0	1,762	9.4	19.9	–2.9
Madagascar	18.5	18.5	1,087	7.7	7.7	–1.4
Malawi	12.8	9.1	648	4.7	6.4	0.1
Mauritania*	28.5	27.7	1,892	18.8	12.7	0.2
Mexico*	63.7	25.0	7,603	15.5	8.7	1.0
Morocco**	44.0	41.3	2,976	20.7	14.5	1.3
Namibia*	43.4	22.8	4,383	16.2	7.8	–0.1
Nicaragua*	60.4	50.3	3,066	20.3	7.3	–2.1
Niger	8.7	12.6	1,111	3.8	2.9	–2.1
Nigeria**	46.1	26.9	1,209	21.5	17.9	–0.8

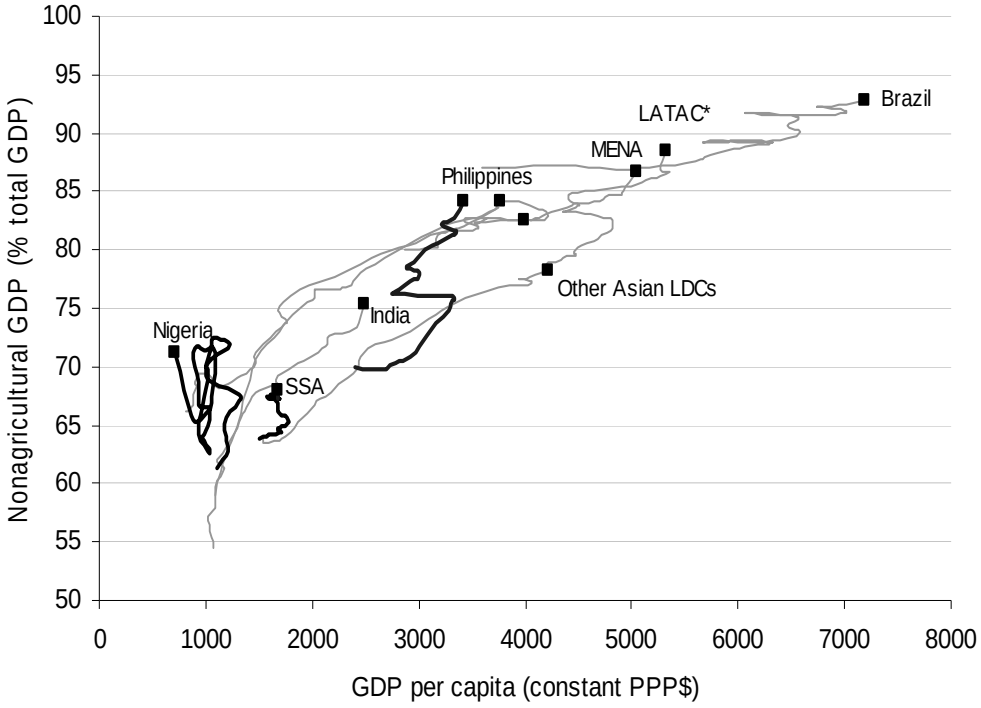
Table A.1. Continued

Country	NALF (%) level, 1980	Urban (%) level, 1980	GDPPC level, 1980	NALF (%) change, 1980–2001	Urban (%) change, 1980–2001	GDPPC growth, 1980–2001
Panama*	71.1	50.4	5,318	9.1	16.4	0.9
Papua New Guinea	17.4	13.0	3,115	8.9	0.2	0.1
Paraguay	55.2	41.7	4,449	10.9	14.2	0.1
Peru	59.7	64.6	4,866	10.4	7.2	–0.2
Philippines, The**	47.6	37.5	3,275	13.4	21.8	0.2
Romania*	65.2	49.1	2,077	20.4	8.6	–0.3
Rwanda	7.2	4.7	1,104	2.1	10.2	–0.1
Senegal	19.2	35.7	1,465	7.3	5.0	0.4
Sierra Leone	30.2	24.1	1,241	8.1	13.8	–3.1
Somalia	21.7	22.2	1,397	7.6	6.9	0.1
Sudan*	27.8	20.0	1,824	12.0	17.0	1.7
Syrian Arab Republic	60.9	46.7	2,965	11.6	3.5	1.0
Tanzania	14.2	14.8	599	5.7	8.1	0.7
Togo	31.3	22.9	1,370	9.6	12.7	–1.0
Trinidad and Tobago	89.1	63.1	9,466	2.5	0.2	1.0
Turkey**	39.6	43.8	4,325	14.9	21.4	1.6
Uruguay	83.4	85.2	7,944	4.1	6.0	0.9
Zambia	24.1	39.8	1,240	7.2	–5.0	–1.6
Zimbabwe	27.6	22.3	2,627	10.3	11.8	0.2
Average	**41.3**	**35.7**	**3,113**	**10.9**	**10.1**	**0.0**

Sources: NALF data are from the FAO (2006); urbanization and growth data are from the World Bank (2007), but GDPPC levels are from Summers and Heston (2002).

Notes: NALF indicates nonagricultural labor force; GDPPC indicates GDP per capita, measured in constant PPPs. The number of asterisks indicates the magnitude of trends in either NALF or urbanization rates; * indicates that one measure has changed by 15 percentage points or more, whereas ** indicates that both measures have changed by roughly 15 percentage points or more.

Figure A.1. Trends in nonagricultural output shares, 1960–2000



Sources: GDP data are from Summers and Heston (2002); nonagricultural GDP data are from the World Bank (2007).
Note: Square data points indicate the year 2000. LDCs indicate least developed countries; MENA, Middle East and North Africa; SSA, Sub-Saharan Africa.

APPENDIX B. TESTING FOR BIASES RELATED TO THE GROWTH OF THE INFORMAL ECONOMY

A pervasive problem in measuring the real volume of output in an economy is the unmeasured informal economy. Many firms in developing countries are not registered with governments, do not pay taxes, and produce outputs that are not recorded in national accounts. Schneider (2005) finds that the average size of the informal economy in 110 developing countries in 1999/2000 was 41 percent of the official GDP. This might not be a cause of much concern if the relationship between formal and informal growth rates were proportional, but this is unlikely to be the case. Schneider's estimates are themselves based on measures of tax burdens, overregulation, and insecure property rights, all factors thought to simultaneously lower official growth rates and increase unofficial growth rates. In other words, Africa's growth rates over the 1960–2000 period may be understated by the "grabbing hand" of past governments. In the 1990s alone, Schneider estimates that the informal economy share of GDP grew from 34 percent in 1990/91 to 41 percent in 1999/2000, and in Nigeria the increase was from 47 to 58 percent.

Table B.1 present the results of a test to determine whether Shneider's estimates of informal economy growth were indeed significantly negatively correlated with formal sector economic growth, especially in the nonagricultural sector. Generally, no bias is found, but there does appear to be a bias in Sub-Saharan Africa, which chiefly seems to relate to the nonagricultural sector: growth in the informal economy in Sub-Saharan Africa is significantly and negatively associated with growth in the formal nonagricultural sector. So it is possible that official growth rates understate total growth in Sub-Saharan Africa. However, the margin is not so large as to change the stylized facts reported in Section 2.

Table B.1. The relationship between sectoral growth rates and the changes in the size of the informal sector

	Regression No. 1	**Regression No. 2**
Indicator	**All least developed countries**	
Constant term	1.87**	2.18***
Informal sector (%GDP), 1990	0.17***	0.16***
Dummy for transition countries	–1.13**	–1.00**
Growth in total GDPPC	–0.01	
Growth in agricultural GDPPC		–0.03
Growth in nonagricultural GDPPC		–0.02
Growth in total GDPPC per capita*SSA	–0.62**	
Growth in agricultural GDPPC*SSA		–0.27
Growth in nonagricultural GDPPC*SSA		–0.50***
Sectoral effects for SSA different? (p-value)		No (0.31)
Estimator	OLS	
Dependent variable	Change in informal GDP (% GDP), 1990–2000	
Number of countries/observations	79	78
R-squared	0.50	0.53
Adjusted R-squared	0.47	0.29[b]

Source: Calculated by authors.

Notes: The dependent variable is the change in the estimated size of the informal economy as a percentage of formal GDP, from Schneider (2005). White Heteroskedasticity-Consistent Standard Errors are used for OLS. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. GDPPC indicates gross domestic product per capita; SSA indicates Sub-Saharan Africa.

a. LAD is the robust least absolute deviations regressor, which controls for the influence of outliers.

b. For the LAD regressor this is the pseudo R-squared.

APPENDIX C. TESTING THE EFFECTS OF URBANIZATION ON ECONOMIC GROWTH

A range of studies have found that agglomeration causes economic growth. Henderson (2003) finds that the more concentrated urban populations increase growth, but only up to a point. In Table C.1, some of these ideas are revisited with some rudimentary cross-sectional regressions explaining GDP per capita growth rates in developing countries over 1970–2001. Some standard control variables are applied based largely on Sachs and Warner (1997). First, the initial urbanization share in 1970 is added. The relationship is in fact negative and marginally significant, suggesting that more urbanized economies in 1970 did not perform better over the subsequent three decades when initial GDP per capita and other factors are controlled for. However, the subsequent regression tests the size of the largest city as an alternative measure of agglomeration. Like Henderson (2003) a positive effect of this agglomeration measure on growth is found, although this arguably casts doubt on whether it is urban concentration that matters (as Henderson suggests) or simply urban city size. Regression No. 3 tests both measures in the same regression. This decomposes Henderson's result into two effects: a negative effect of general urbanization, but a positive effect of agglomeration. What explains this pattern is difficult to say. Perhaps city size really does represent agglomeration effects—the main channel through which urbanization is now thought to promote growth—while the general urbanization measure picks up all the residual effects associated with urbanization, many of which are negative—such as a history of slow agricultural growth and urban biased policies (in which case even initial urbanization levels may be endogenous), high unemployment, a large urban informal sector, and so on. In any event, this stylized fact is consistent with the conclusions that agglomeration effects are important for growth, but that urbanization per se is at best a mixed blessing.

Table C.1. Testing for agglomeration effects on LDC economic growth, 1970–2001

Indicator	Regression No. 1	Regression No. 2	Regression No. 3
Log of GDP per capita, 1970	–2.44**	–1.43***	–0.70*
Demographic transition effects	2.01**	–2.00*	1.70**
Years of Sachs-Warner openness	0.09***	0.10***	0.10***
Log of life expectancy, 1970	8.31**	3.39	6.56*
Land in tropics (proportion)	–1.57***	–1.04***	–1.09***
Urban population proportion (0–1), 1970	–3.50*		–4.23**
Largest city in 1970 (millions)		0.30***	0.39***
Number of countries/observations	65	66	66
Estimator		Ordinary least squares	
R-squared	0.64	0.65	0.70
Adjusted R-squared	0.60	0.62	0.66

Source: Calculated by authors.

Notes: The dependent variable is growth of GDP per capita, 1970–2001. White Heteroskedasticity-Consistent Standard Errors are used for OLS, and Huber Sandwich Standard Errors are used for the least absolute deviations (LAD) regressions. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. In addition to a lack of robustness with the LAD regressor, these results were not robust for the period 1960–80 but were robust thereafter, presumably due to the accelerated growth rates of China and India in the post-1980 period (results are available on request).

APPENDIX D. THE RELATIONSHIP BETWEEN URBANIZATION LEVELS AND RELATIVE FOOD PRICES

This appendix presents results from exploring the relationship between urbanization and consumer food prices. Whereas time-series agricultural prices at the farm gate are available for many countries and years, there are no easily comparable measures of food prices paid by consumers. The strategy adopted, therefore, was to look at the food price index from the International Comparison Program (ICP) directed by the World Bank. This index is the ratio of the purchasing power parity (PPP) conversion factor for food to the official exchange rate (XR). PPPs measure how many units of a country's currency would be required to buy a common basket of goods—in this case a basket of food and nonalcoholic beverages—normalized so as to cost one unit of the base country's currency (usually the U.S. dollar). Countries with high PPP/XR ratios indicate that the good in question is more expensive that it would be in a world with no transport costs, fully tradable goods, and undistorted exchange rates. This suggests that the food price index may be higher in countries that are closed to trade, or in which food products are nontradable (that is, perishable or only produced locally) or in which transport infrastructure is very poor. Exchange rate distortions also need to be taken into account, because distorted exchange rates may cause some short-run measurement error. These caveats aside, the PPP/XR measure of prices is really the only cross-country measure for the consumption side that is truly internationally comparable.

The regional means for the ICP food price index are presented in the second column of Table D.1. Interestingly, the data suggest that in African countries the local currency buys less food than could be bought on international markets (abstracting from transport costs, and so on). Food is much cheaper in other regions, especially South Asia. That African currencies lack domestic purchasing power for food could be surprising to many, but there are several factors that could explain it, including low agricultural productivity, distortions due to natural resource abundance (Dutch Disease), high transport costs, the low tradability of food in much of Africa (Delgado 1992), and, perhaps, premature urbanization. That said, methodological issues in the latest ICP approach could partially account for this phenomenon, so in subsequent regressions regional dummies were always included to control for any lack of comparability across regions, and other genuine regional effects.

Regression No. 1 looks at all LDCs (although the ICP data omit all Central American and Caribbean countries). Explanatory variables are specified contemporaneously, except for a lagged index of exchange rate distortions. A dummy for oil producers based on a World Bank definition is used to control for Dutch Disease effects on both exchange rates and domestic prices, and sectoral GDPs per capita and the urbanization rate are also specified. Since the dependent variable, the price index, is logged—as are all nondummy explanatory variables—the coefficients represent elasticities. Surprisingly, no effect of agricultural GDP per capita on food prices was found, but this appears to be because these effects are captured by the regional dummy variables (removing the dummies renders agricultural GDP per capita significant at the 10 percent level, although the elasticity is still small [0.07]). A history of appreciated exchanges has the expected negative effect, presumably because appreciated exchange rates make imports cheaper. But the oil producer dummy has a large positive effect. Oil producing countries tend not to have achieved fast growth, but they do have high levels of wealth and inequality, as well as higher wages. They may also be prone to neglecting agriculture, because oil producing governments extract much more revenue from the mineral sector than from the agricultural sector. Whatever the precise channel, oil producers have food prices that are about 20 percent higher than non-oil producers. Finally, as hypothesized, greater urbanization of the population, controlling for income and other factors, also significantly raises food prices. A 1-percent increase in the urbanization level raises food prices by 0.2 percent.

Regression No. 2 looks at whether urbanization also explains food deficits. Recall that if a government wishes to avoid rising food prices, one option is to increase its imports of food, which could also retard economic growth and poverty reduction. The food deficit is defined as food imports minus food exports divided by total food trade. Again, all coefficients are elasticities, and the specification is the

same except for the omission of exchange rate distortions, which have no significant effect. Now, as expected, a significant negative effect of agricultural GDP per capita is found. Oil producers also have much larger food deficits, which is no surprise given their larger foreign exchange earnings. But again, a large elasticity of almost 0.3 is found on the urbanization level.

Finally, Regressions 3 and 4 replicate Regressions 1 and 2 for Sub-Saharan African countries only. These results might be important in overcoming any of the aforementioned methodological discrepancies between African and non-African countries with regard to the ICP food price index. The results are almost identical, however. The second-last row of Table D.1 also reports urbanization elasticities based on the least absolute deviations robust regressor. Again, the coefficients are robust, although the effect of urbanization on food deficits is estimated to be much larger within Sub-Saharan Africa.

So faster urbanization—even after controlling for the positive relationship between urbanization and per capita income—is strongly and robustly associated with higher food prices and larger food deficits. Since the relationship between food prices and poverty headcounts is essentially definitional, and since food typically comprises 50 percent or more of a poor person's consumption expenditure, it does seem quite possible that "premature" urbanization can indeed contribute to higher poverty in developing countries. However, the food price measures used below is not an ideal test of this hypothesis. More appropriate tests would involve time-series data on urbanization and food prices, although there are serious data constraints when it comes to obtaining food price series for many developing countries.

Table D.1. Testing the relationship urbanization and food price levels

Indicator	Regional mean food price index	Regression No.1 All LDCs	Regression No.2 All LDCs	Regression No.3 SSA only	Regression No.4 SSA only
Nonagricultural GDP per capita		0.02	–0.01	–0.03	0.05
Agricultural GDP per capita		0.01	–0.20**	–0.01	–0.19*
Urban population share (%)		0.20***	0.27**	0.21***	0.28*
Oil producer dummy		0.27***	0.43***	0.35***	0.47***
XR distortion index, 1980–1999[a]		–0.31***		–0.44***	
Regional effects (East Asia is base)					
South America	75	–0.22**	–0.29		
Sub-Saharan Africa	101	0.29***	–0.07		
South Asia	57	–0.04	0.31		
Eastern Europe	86	0.38***	0.002		
Former Soviet Union	58	–0.18	0.16		
East Asia	83				
LAD regressor: ε for urban[b]		0.19***	0.32*	0.21***	0.54*
Estimator		Ordinary least squares			
Dependent variable (logged)		Food price index[c]	Food deficit[d]	Food price index[c]	Food deficit[d]
Number of countries/observations		74	100	34	35
R-squared		0.66	0.32	0.68	0.26

Source: Calculated by authors.

Notes: *, **, and *** indicate significance at the 10, 5, and 1 percent level, respectively. LDCs indicates least developed countries; SSA, Sub-Saharan Africa; FPI, food price index; and LAD, least absolute deviations. All variables except dummy variables are in logs.

a. The exchange rate distortion index is the number of years from 1980 to 1999 in which the black market premium on the exchange rate (a measure of appreciation) was over 40 percent, a critical line defined by Sachs and Warner (1995). White Heteroskedasticity-Consistent Standard Errors are used for OLS.

b. This line reports the elasticity and level of significance for the coefficient on the urban population share base on the same specification, but using the least absolute deviations robust regressor.

c. The food price index is the log of the ratio of the food and nonalcoholic beverages purchasing power parity conversion factor to the official exchange rate, or the food price level, from the 2005 International Comparison Program.

d. The food deficit is measured here as food imports minus food exports divided by total food trade (exports plus imports).

REFERENCES

Ainsworth, M., Kathleen Beegle, and Andrew Nyamete. 1996. The impact of women's schooling on fertility and contraceptive use: A study of fourteen Sub-Saharan African countries. *World Bank Economic Review* 10 (1)**:** 85–122.

Anríquez, Gustavo, and Genny Bonomi. 2007. Long-term farming and rural demographic trends. Background Paper for World Development Report 2008, World Bank, Washington, D.C.

Bates, Robert H. 1981. *Markets and states in tropical Africa: The political basis of agricultural policies.* Berkeley: University of California Press.

Benjamin, Dwayne, Loren Brandt, and John Giles. Forthcoming. Income inequality during China's economic transition. In Loren Brandt and Thomas Rawski, eds., *China's Economic Transition: Origins, Mechanisms, and Consequences.* Cambridge: Cambridge University Press.

Berry, R. Albert, and William Cline. 1979. *Agrarian structure and productivity in developing countries.* Baltimore: Johns Hopkins University Press.

Besley, Timothy, and Robin Burgess. 2004. Can labour regulation hinder economic performance? Evidence from India. *Quarterly Journal of Economics* 119 (1): 91–134.

Bevan, David L., Paul Collier, and Jan Willem Gunning. 1999. *The political economy of poverty, equity, and growth: Nigeria and Indonesia.* New York: Oxford University Press.

Bezemer, Dirk, and Derek D. Headey. 2008. Agriculture, development and urban bias. *World Development* 34 (8)**:** 1342–1364.

Bhalla, G. S., and Peter B. Hazell. 2003. Rural employment and poverty strategies to eliminate rural poverty within a generation. *Economic and Political Weekly* 38 (33)**:** 3473–3484.

Bhattacharya, B. B., and S. Sakthivel. 2004. *Economic reforms and the jobless growth in India in the 1990s.* Working Paper E/245/2004. Delhi: Institute of Economic Growth, University of Delhi Enclave.

Binswanger, H. P., and K. Deininger. 1997. explaining agricultural and agrarian policies in developing countries. *Journal of Economic Literature* 35 (4)**:** 1958–1905.

Bocquier, Philippe. 2004. *World urbanization prospects: An alternative to the UN model of projection compatible with urban transition theory.* DIAL Working Paper No. DT/2004/08. Paris: Developpement Institutions et Analyses de Long Terme.

Brockerhoff, Martin, and Ellen Brennan. 1998. The poverty of cities in developing regions. *Population and Development Review* 24 (1)**:** 75–114.

Brohman, J. 1997. *Popular development, rethinking the theory and practice of development.* Oxford: Blackwell Publishers.

Buvinic, Mayra, Catherine Gwin, and Lisa M. Bates. 1996. *Investing in women: Progress and prospects for the World Bank.* Washington, D.C.: Overseas Development Council in cooperation with the International Center for Research on Women and Johns Hopkins University Press.

Chen, Shaohua, and Martin Ravallion. 2007. China's (uneven) progress against poverty. *Journal of Development Economics* 82 (1)**:** 1–42.

Chenery, Hollis B. 1979. *Structural change and development policy.* New York: Oxford University Press.

Chotikapanich, Duangkamon, D. S. Prasada Rao, and Kam Ki Tang. 2007. Estimating income inequality in China using grouped data and the generalized beta distribution. *Review of Income and Wealth* 53 (1)**:** 127–147.

Christiaensen, Luc, Lionel Demery, and Jesper Kühl. 2006. *The role of agriculture in poverty Reduction: An empirical perspective.* World Bank Policy Research Working Paper Series No. 4013. Washington, D.C.: World Bank.

Cohen, B. 2004. Urban growth in developing countries: A review of current trends and a caution regarding existing forecasts. *World Development* 32 (1)**:** 23–51.

Collier, Paul. 2007. *The bottom billion: Why the poorest countries are failing and what can be done about it*. New York: Oxford University Press.

Davis, Mike. 2007. *Planet of Slums.* London: Verso.

de Brauw, Alan. 2002. *Are women taking over the farm in China?* Department of Economics Working Paper No. 199. Williamstown, MA, USA: Williams College.

de Brauw, Alan, and Gero Carletto. 2008. Improving the measurement and policy relevance of migration information in multi-topic household surveys. Unpublished manuscript. International Food Policy Research Institute, Washington, D.C.

de Soto, Hernando. 2000. *The mystery of capital: Why captitalism triumphs in the West and fails everywhere else.* New York: Basic Books.

Deaton, A. and V. Kozel. 2005. Data and dogma: The great Indian poverty debate. *World Bank Research Observer* 20 (2)**:** 177–199.

Delgado, Christopher. 1992. Why domestic food prices matter to growth strategy in semi-open West African Agriculture. *Journal of African Economies* 1(November)**:** 446–471.

Diao, Xinshen, Peter Hazell, Danielle Resnick, and James Thurlow. 2005. *The role of agriculture in development: Implications for Sub-Saharan Africa.* Development Strategy and Governance Division Discussion Paper No. 29. Washington, DC: International Food Policy Research Institute.

Du, Yang, Albert Park, and Sangui Wang. 2005. Migration and rural poverty in China. *Journal of Comparative Economics* 35: 688–709.

Dudley, Kirk, and Bernard Pillet. 1998. Fertility levels, trends, and differentials in Sub-Saharan Africa in the 1980s and 1990s. *Studies in Family Planning* 29 (1)**:** 1–22.

Duranton, Gilles. 2007. From cities to productivity and growth in developing countries. Growth Commission Background Paper. http://www.growthcommission.org.

Eastwood, Robert, and Michael Lipton. 2004. Rural–urban dimensions of inequality change. In Giovanni Andrea Cornia, ed., *Inequality, growth, and poverty in an era of liberalization and globalization.* Oxford: Oxford University Press.

Fan, Shenggen. 2008. Public expenditures, growth, and poverty: Lessons from developing countries. Baltimore: Johns Hopkins University Press.

Fan, Shenggen, and Connie Chan-Kang. 2005. Is small beautiful? Farm size, productivity, and poverty in Asian agriculture. *Agricultural Economics* 32 (1)**:** 135–146.

Fan, Shenggen, and Peter Hazell. 2001. Returns to public investments in the less-favored areas of India and China. *American Journal of Agricultural Economics* 83 (5)**:** 1217–1222.

Fan, Shenggen, Connie Chan-Kang, and Anit Mukherjee. 2005. *Rural and urban dynamics and poverty: Evidence from China and India.* Food Consumption and Nutrition Division Discussion Paper No. 196. Washington, D.C.: International Food Policy Research Institute.

FAO (Food and Agriculture Organization of the United Nations). 2006. AGROSTAT. Rome.

Fay, M., and C. Opal. 1999. *Urbanization without growth: A not-so-uncommon phenomenon.* World Bank Policy Research Working Paper No. 2412. Washington, D.C.: World Bank.

Foster, A., and M. Rosenzweig. 2004. Agricultural productivity growth, rural economic diversity, and economic reforms: India, 1970–2000. *Economic Development and Cultural Change* 52 (3)**:** 509–542.

Gille, Halvor. 1985. The world fertility survey: Policy implications for developing countries. *International Family Planning Perspectives* 11 (1)**:** 9–17.

GRUMP (Global Rural–Urban Mapping Project). 2008. Urban/rural population grids. New York, Washington, D.C., and Cali, Colombia: Center for International Earth Science Information Network (CIESIN), Columbia University; International Food Policy Research Institute; World Bank; and Centro Internacional de Agricultura Tropical.

Gugler, Josef. 1982. Overurbanization reconsidered. *Economic Development and Cultural Change* 31 (1)**:** 173–189.

Haggblade, S., P. B. R. Hazell, and T. Reardon. 2007a. Strategies for stimulating equitable growth in the rural nonfarm economy. In S. Haggblade, P. B. R. Hazell and T. Reardon, eds., *Transforming the rural nonfarm economy.* Baltimore: Johns Hopkins University Press.

_____. 2007b. *Transforming the rural nonfarm economy.* Baltimore: Johns Hopkins University Press.

Harris, John R, and Michael P. Todaro. 1970. Migration, Unemployment and Development: A Two-Sector Analysis. *American Economic Review* 60 (126–142).

Hazell, Peter, and Xinshen Diao. 2005. The role of agriculture and small farms in economic development. In *The future of small farms.* Proceedings of a research workshop held in Wye, United Kingdom, June 26–29, 2005. Washington, D.C.: International Food Policy Research Institute.

Henderson, Vernon. 2003. The urbanization process and economic growth: The so-what question. *Journal of Economic Growth* 8 (1)**:** 47–71.

Henderson, Vernon. 2005. Urbanization and Growth. In Philippe Aghion and Steven N. Durlauf, eds., *Handbook of Economic Growth.* Amsterdam: Elselvier.

Hewett, P. C., and M. R. Montgomery. 2001. *Poverty and public services in developing-country cities.* Policy Research Division Working Papers No. 154. New York: Population Council.

Hirschman, Albert O. 1958. *The strategy of economic development,* New Haven: Yale University Press.

Holz, Carsten A. 2004. China's Reform Period Economic Growth: Why Angus Maddison Got It Wrong and What That Means. *Social Science Division Working Paper, Hong Kong University of Science & Technology.*

IWMI (International Water Management Institute) and Earthscan. 2007. *Water for food, water for life: A comprehensive assessement of water management in agriculture.* London and Colombo: Earthscan and IWMI.

Johnson, Michael, Peter Hazell, and Ashok Gulati. 2003. The role of intermediate factor markets in Asia's Green Revolution: Lessons for Africa? *American Journal of Agricultural Economics* 85 (5)**:** 1211–1216.

Johnston, Bruce F., and P. Kilby. 1975. Agriculture and structural transformation: Economic strategies in late developing countries. London: Oxford University Press.

Joshi, P. K., Ashok Gulati, and Ralph Cummings, Jr. 2007. *Agricultural diversification and smallholders in south Asia.* New Delhi: Academic Foundation.

Kanbur, Ravi, and Xiaobo Zhang. 1999. Which regional inequality: Rural–urban or coast–inland? An Application to China. *Journal of Comparative Economics,* 27**:** 686–701.

_____. 2005. Fifty years of regional inequality in China: A journey through central planning, reform and openness. *Review of Development Economics* 9 (1)**:** 87–106.

Karp, Larry. 2007. Managing migration from the traditional to modern sector in developing countries. Background Paper for World Development Report 2008, World Bank, Washington, D.C.

Kelley, Allen C., and Robert Schmidt. 2003. Economic and demographic change: A Synthesis of models, findings, and perspectives. In Nancy Birdsall, Allen C. Kelley, and Steven Sinding, eds., *Population Matters.* New York: Oxford University Press.

Khan, Azizur Rahman. 2007. *Asian experience on growth, employment and poverty.* Geneva: United Nations Development Programme and International Labour Organization.

Kherallah, Mylene, Christopher Delgado, Eleni Gabre-Madhin, Nicholas Minot, and Michael Johnson. 2002. *Reforming Agricultural Markets in Africa,* Baltimore: John Hopkins University Press.

Kochhar, Kalpana, Utsav Kumar, Raghuram Rajan, Arvind Subramanian, and Ioannis Tokatlidis. 2006. *India's pattern of development: What happened, what follows?* IMF Working Paper No. 06/22. Washington, D.C.: International Monetary Fund.

Krueger, Anne O., Maurice Schiff, and Alberto Valdes. 1991. *Political economy of agricultural pricing policy.* Baltimore: Johns Hopkins University Press.

Krugman, Paul R. 1991. Increasing returns and economic geography. *Journal of Political Economy* 99 (3)**:** 483–499.

Kuznets, Simon. 1955. Economic growth and income inequality. *American Economic Review* 45 (2): 1–28.

_____. 1973. Modern economic growth: Findings and reflections. *American Economic Review,* 63 (3)**:** 247–258.

Laidlaw, Karen A., and Edward G. Stockwell. 1979. Trends in the relationship between urbanisation and development in Africa. *Journal of Modern African Studies* 17 (4)**:** 687–694.

Lewis, Arthur W. 1954. Economic development with unlimited supplies of labour. *The Manchester School* 28 (2)**:** 139–191.

Lipton, M. 1977. Why poor people stay poor: A study of urban bias in world development, London: Temple Smith.

Lofgren, Hans, and Moataz El-Said. 2001. Food subsidies in Egypt: Reform options, distribution and welfare. *Food Policy* 26**:** 65–83.

Maddison, Angus. 1998. *Chinese economic performance in the long run,* Paris: Development Centre of the Organisation for Economic Co-operation and Development.

Malthus, Thomas R. 1798. An essay on the principle of population, and A summary view of the principle of population, Harmondsworth: reprinted by Penguin Press.

Mehra, Rekha, and Sarah Gammage. 1999. Trends, countertrends, and gaps in women's employment. *World Devlopment* 27 (3)**:** 533–550.

Milanovic, Branko. 2005. *Half a world: Regional inequality in five great federations.* World Bank Policy Research Working Paper No. 3699. Washington, D.C. World Bank.

Mukherjee, Anit, and Xiaobo Zhang. 2007. Contrasting rural nonfarm policies and performance in China and India: Lessons for the future. In Steven Haggblade, Peter Hazell, and Thomas Reardon, eds., *Transforming the rural nonfarm economy.* Baltimore: Johns Hopkins University Press.

Munshi, Kaivan, and Mark Rosenzweig. 2005. *Why is mobility in India so low? Social insurance, inequality, and growth.* CID Working Paper No. 121. Cambridge: Centre for International Development, Harvard University.

Nagayets, Oksana. 2005. Current status and key trends. Information brief prepared for the workshop, "The Future of Small Farms," organized by the International Food Policy Research Institute, Imperial College London, and the Overseas Development Institute, Wye, England, June 26–29, 2005.

Neuwirth, Robert 2005. *Shadow cities: A billion squatters. A new urban world.* New York: Routledge.

Olson, Mancur. 1971. *The logic of collective action: Public goods and the theory of groups.* Cambridge: Harvard University Press.

Otsuka, Keijiro. 2007. The rural industrial transition in East Asia: Influences and implications. In Steven Haggblade, Peter Hazell, and Thomas Reardon, eds., *Transforming the Rural Nonfarm Economy.* Baltimore: Johns Hopkins University Press.

Quigley, John M. 2007. Urbanization, agglomeration and economic development. Growth Commission Background Paper. http://www.growthcommission.org.

Ranis, Gustav, and John C. H. Fei. 1961. A theory of economic development. *American Economic Review* 51: 533–565.

Ravallion, Martin, Shaohua Chen, and Prem Sangraula. 2007. *New evidence on the urbanization of global poverty.* World Bank Working Paper No. WPS4199. Washington, D.C.: World Bank.

Ravallion, Martin, and Gaurav Datt. 1996. How important to India's poor is the sectoral composition of economic growth? *World Bank Economic Review* 10 (1)**:** 1–25.

Rawski, Thomas G. 2001. What is happening to China's GDP statistics? *China Economic Review*, 12(4): 347-354.

Richardson, Harry W. 1987. The costs of urbanization: A four-country comparison. *Economic Development and Cultural Change* 35 (3)**:** 561–580.

Rosegrant, Mark, and Peter Hazell. 2000. *Transforming the rural Asian economy: The unfinished revolution.* Oxford and New York: Oxford University Press on behalf of the Asian Development Bank.

Sachs, Jeffrey D., and Andrew Warner. 1995. Economic reform and the process of global integration. *Brookings Papers on Economic Activity* 1: 1–118.

_____. 1997. Sources of slow growth in Africa. *Journal of African Economies* 6 (3)**:** 335–376.

Schiff, M. and C. Montenegro. 1997. Aggregate agricultural supply response in developing countries. *Economic Development and Cultural Change* 45**:** 393–410.

Schneider, Friedrich. 2005. Shadow economies around the world: What do we really know? *European Journal of Political Economy* 21**:** 598–642.

Schultz, Theodore P. 1997. Demand for children in low income countries. In Mark R. Rosenzweig and Oded Stark, eds., *Handbook of population and family economics.* Amsterdam: Elsevier Science.

Schultz, Theodore W. 1964. *Transforming traditional agriculture.* New Haven: Yale University Press.

_____. 1993. Demand for children in low income countries in: Mark Rosenzweig and Oded Stark (eds.) *Handbook of Population and Family Economics.* Amsterdam: Elselvier.

Sen, Amartya K. 1967. Surplus labour in India: A critique of Schultz's statistical test. *The Economic Journal* 77 (305)**:** 154–161.

Simon, Julian. 1992. *Population and development in poor countries: Selected essays*, Princeton, NJ: Princeton University Press.

Singh, Susheela, J. B. Casterline, and J. G. Cleland. 1985. The proximate determinants of fertility: Sub-national variations. *Population Studies* 39 (1)**:** 113–135.

Smith, Adam. 1776. An inquiry into the nature and causes of the wealth of nations. London: Methuen and Co.

Sovani, N. V. 1964. The analysis of "over-urbanization." *Economic Development and Cultural Change* 12 (2)**:** 113–122.

Summers, Robert, and Alan Heston. 2002. Penn World Table Version 6.1. Philadelphia: Center for International Comparisons at the University of Pennsylvania.

Temple, Jonathan, and Ludger Woessman. 2006. Dualism and cross-country growth regressions. *Journal of Economic Growth* 11 (3)**:** 187–228.

Timmer, C. P. 2002. Agriculture and economic development. In B. Gardner and G. Rausser, eds. *Handbook of Agricultural Economics, Volume 2a.* Amsterdam: Elselvier.

Todaro, Michael P. 1997. *Urbanization, unemployment, and migration in Africa: Theory and policy.* PDR Working Paper No. 104. New York: Population Development Council.

UN (United Nations). 2004. *World urbanization prospects: The 2003 revision.* New York: United Nations.

von Braun, Joachim. 2007. *The world food situation: New driving forces and required actions.* IFPRI Food Policy Report. Washington D.C.: International Food Policy Research Institute.

Wang, Xiaolu, and Lian Meng. 2001. A reevaluation of China's economic growth. *China Economic Review* 12 (2001)**:** 338–346.

World Bank. 1979. *World development report.* Washington, D.C.

_____. 1984. *World development report 1984.* New York: Oxford University Press.

_____. 2000. World development report 2000: Entering the 21st Century. Washington, D.C.

_____. 2003. *Rural poverty report.* Washington, D.C.

_____. 2007. *World development indicators 2007*. Washington, D.C.

_____. 2008. *World development report 2008: Agriculture for development.* Washington D.C.

_____. 2009. World development report 2009: Spatial disparities and development policies. Washington, D.C. (forthcoming).

Wood, Adrian. 1997. Openness and wage inequality in developing countries: The Latin American challenge to East Asian conventional wisdom. *World Bank Economic Review* 11 (1)**:** 33–57.

Zhang, Xiaobo, and Xiaopeng Luo. 2007. How to make pro-poor policy work: Lessons from China's rural reform. *Global Development Network Conference.* Beijing.

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2033 K Street, NW
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Fax: +1-202-467-4439
Email: ifpri@cgiar.org

IFPRI ADDIS ABABA

P. O. Box 5689
Addis Ababa, Ethiopia
Tel.: +251 11 6463215
Fax: +251 11 6462927
Email: ifpri-addisababa@cgiar.org

IFPRI NEW DELHI

CG Block, NASC Complex, PUSA
New Delhi 110-012 India
Tel.: 91 11 2584-6565
Fax: 91 11 2584-8008 / 2584-6572
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