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Urbanization and the Wealth of Nations

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Abstract

The proportion of a country's population living in urban areas is highly correlated with its level of income. Urban areas offer economies of scale and richer market structures, and there is strong evidence that workers in urban areas are individually more productive, and earn more, than rural workers. However, rapid urbanization is also associated with crowding, environmental degradation, and other impediments to productivity. Overall, we find no evidence that the level of urbanization affects the rate of economic growth. Our findings weaken the rationale for either encouraging or discouraging urbanization as part of a strategy for economic growth.

Introduction

According to United Nations (UN) projections, more than half of the world's population will live in urban areas by the end of 2008 (2). The continued increase in the share of the population living in urban areas in recent decades has been welcomed by many economists, who view urbanization as a positive achievement on the path toward wealth and prosperity. According to this view, urbanization underpins and enhances economic growth and therefore increases the wealth of nations in the long run (3).

Urbanization is a complex phenomenon. Under favorable conditions, initially very small settlements can rapidly develop, first into small towns, and then cities as populations grow, and new economic and political structures emerge. Successful sectors within the city will attract further investment, generate increased demand for labor, and trigger migration to the city as a further mechanism of urban growth. With a better quality of life, however, cities may become a major attractor for poor rural populations, leading to large urban unemployment, poverty, and, in many cases, also increased urban violence, congestion, and environmental degradation. The growth of urban areas has promoted concentrations of land, water, and air pollution (4), and is associated with the formation of large and rapidly growing slum populations in and around many major cities. According to the UN, more than 1 billion people, or about 14 percent of the total global population, lived in areas classified as slums in 2005 (5). These squalid settlements have come to be known for their

hopelessness, their atmosphere of fear, and the social exclusion of their residents, and are hardly a symbol of economic progress.

Governments have often undertaken active policies affecting the urbanization process. On the one hand, policy makers can inhibit urbanization by providing support for rural populations in the form of agricultural subsidies, or directly target rural populations by rural transfers or infrastructure projects. On the other hand, governments have historically often displayed large biases towards urban areas and urban populations in the developing world (6, 7) at the expense of the rural population. Due to the political pressure exerted by urban dwellers, central governments have encouraged urbanization by keeping agricultural prices low, by direct investment in urban industries, and by a more generous provision of public services such as health and education (8).

In this article we show that there is no empirical evidence of a causal effect of the level of urban population share on the pace of economic growth. Although the agglomeration of diffuse populations into urban areas will generally increase output per capita, very large or rapidly growing urban areas can have offsetting negative effects through crowding and environmental degradation, and by overwhelming city administrations' capacities. Policies regarding urban development should weigh carefully the positive and negative spillovers of urbanization, without a presumption that urbanization is a policy for promoting economic growth.

The Effects of Urbanization

The economics literature is replete with references to urbanization as a natural concomitant of modernization and industrialization (3, 9). Cities as locations of concentrated economic activities offer large and diversified labor pools and are in closer proximity to customers and suppliers, (10). Cities also offer increased opportunities for division of labor and make intra-industry specialization more likely (11). Firms may not only profit from horizontal and vertical spillovers, but are also able to respond to market demand changes more effectively (12-15). Relatively cheaper transport combines with the proximity to customers and suppliers to reduce the costs of trade (16, 17). Moreover, by aggregating educated and

creative people in one place, cities incubate new ideas and technologies and may lead to efficient growth by potentiating the full social returns to increased human capital (18, 19). While these models highlight the advantages of urbanization, the implied optimal level of urban population share is unclear. As urban areas become more densely populated, changes in urban population share may have no effect on productivity growth.

Figure 1 shows the positive cross-country relationship between the level of income and the urban population share in 2000: the correlation between real income per capita and the fraction of the population in urban areas is 0.8. The theoretical arguments for urbanization as a source of productivity gains and the strong correlation between income and urban population share have been the foundation of a literature promoting urban growth as the path toward wealth and development (20) and have led to the perception of a strong, positive effect of urbanization on economic growth (3).

Figure 1: Income per Capita and Urbanization, 2000

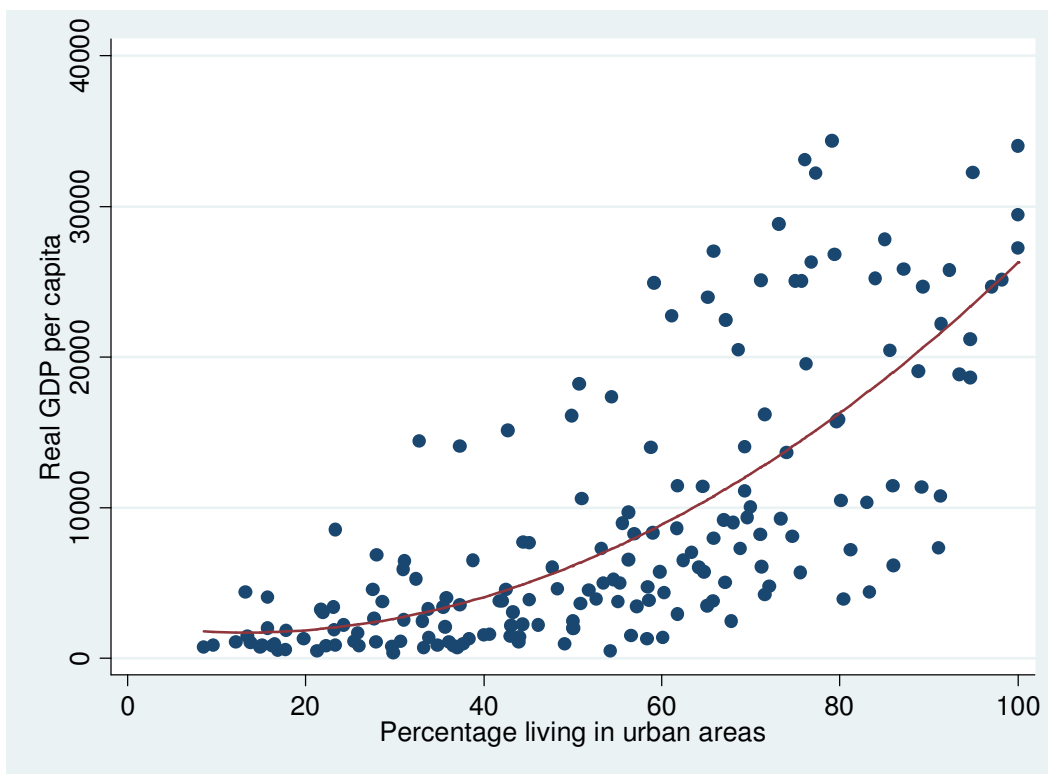


Figure 1 shows 180 countries with available income and urbanization data in 2000. The income variable is gross domestic product per capita at purchasing power parity (PPP) (21). The percentage of people living in

urban areas come from (22). These are the data we use throughout the paper. The main source of UN urban population share data are decennial censuses. The numbers rely on country-specific definitions, which are not always comparable across countries and not necessarily consistent across time (23, 24). Nevertheless, the picture looks virtually identical when geography-based data such as those generated by the Global Rural Urban Mapping Project (25) or alternative measures such as the urban/rural ratio are used (23).

The Effect of Urban Population Share on Income Levels

Although the cross-country scatter plot of income and urban population share is striking, it provides little insight into the causal relation between urban population share and economic development. At issue is whether urbanization promotes economic well-being. That is, would raising the level of urban population share in a country promote economic growth and a higher level of income? The relationship in Figure 1 could be due simply to an effect of the income level on the level of urban population share with no feedback from urban population share to the level of income. Alternatively, it could be due to a common factor that affects both urban population share and income, without either of them affecting the other.

Two previous studies have failed to find a link between the share of the population urbanized and economic growth (26, 27). We investigate the question in more detail using a number of new approaches and argue that the result is robust. Our first approach is to investigate the effects of urban population share on income levels across countries for 1960-2000. The data set is configured into four 10-year intervals to limit the influence of short-term economic cycles, and to avoid reliance on interpolated urban population share data. We carry out a Granger causality test between income per capita and urban population share (28). Urban population share is said to “Granger-cause” income if, controlling for past income levels, past values of urban population share are predictive of future values of income. This is a low-threshold test insofar as it does not require direct evidence of a structural, causal link from urban population share to income; it merely requires that urbanization has some predictive power for future income levels.

The results of the Granger causality test are summarized in Table 1 below. We take real income per capita (29) as the dependent variable, and explain it with (10-year) lagged income as well as the (10-year) lagged level of urban population share. We also add fixed

effects that control for country-specific factors that are constant over time, and time dummies to allow for a changing relationship over time. As shown in Table 1, once we control for the lagged income level, the lagged urban population share is not a statistically significant predictor of future income levels. Knowledge of a country's level of urban population share does not appear to help us predict its future income level.

The results of the Granger causality tests have to be interpreted with caution. Despite the fact that our specification incorporates time and country fixed effects (30), we may be excluding a number of other variables that affect economic growth, and thus obtain biased estimates. In addition, 10 years may be too short a time horizon for an economy to capture the benefits of urbanization (31).

Table 1: Granger Causality Test

	Dependent Variable
	Log GDP per capita
Urban population share (Ten years previously)	-0.0473 (0.062)
Log GDP per capita (Ten years previously)	0.712*** (0.063)
Observations	561
Number of countries	163

Notes:
 Bootstrapped standard errors in parentheses.
 *significant at 10%; ** significant at 5%; *** significant at 1%
 Country and time fixed effects are included in all specifications. Estimation results are based on the bias corrected LSDV estimator developed by Bruno (40).

To address this issue we investigate whether the initial level of urban population share in 1970 affects the rate of economic growth over the period 1970 to 2000. In this cross sectional approach we have to control for other factors that may influence growth. Rather than specify our own ad hoc model of growth we use a specification based on the work of Sala-i-Martin, Doppelhofer, and Miller (32) (hereafter SDM) who examine 67 potential explanatory variables, not including urban population share, as possible explanations for economic growth, and identified those variables with the highest posterior probability (via Bayesian updating) given the evidence.

Table 2: Long-Term Effects of Urban Population Share

	Dependent Variable: Average Annual Growth 1970-2000		Dependent Variable: Average Annual Growth 1970-2000	
	Full sample		Low Income Countries	
	(1)	(2)	(3)	(4)
East Asia dummy variable ^{a)}	1.609** (0.68)	1.606** (0.67)	5.075*** (1.29)	4.725* (2.23)
Primary schooling 1970	0.00363 (0.012)	0.00298 (0.012)	0.0438 (0.034)	0.0480 (0.043)
Investment price 1970	-0.00483*** (0.0013)	-0.00486*** (0.0013)	-0.00405*** (0.0011)	-0.00414** (0.0015)
Log (GDP) 1970	-1.669*** (0.30)	-1.560*** (0.55)	-3.424** (1.31)	-2.529 (3.50)
Fraction of area tropical	-0.787* (0.42)	-0.766* (0.44)	-0.473 (1.68)	-0.316 (1.90)
Coastal density	0.000657* (0.00038)	0.000485 (0.00048)	0.0120* (0.0060)	0.0123 (0.0081)
Fraction Confucian ^{b)}	2.072* (1.08)	2.249** (1.12)		
Life expectancy 1970	0.181*** (0.059)	0.184*** (0.061)	0.0780 (0.084)	0.0666 (0.10)
Africa dummy variable ^{a)}	-0.0647 (0.61)	-0.0888 (0.68)	-0.0800 (1.30)	-0.183 (1.63)
Urban population share 1970	-0.00950 (0.011)	-0.00664 (0.059)	-0.0379 (0.038)	0.312 (1.56)
Urban Population Share 1970 squared		0.000204 (0.00041)		0.00141 (0.0056)
Urban Population Share x Log(GDP)1970		-0.00257 (0.0094)		-0.0569 (0.22)
Constant ^{c)}	5.284** (2.36)	4.608 (3.54)	20.84** (8.82)	15.33 (21.6)
p-value for F-Test of joint significance of urban share terms		0.857		0.794
Sample	All countries	All countries	Low income	Low income
Observations	86	86	24	24
R-squared	0.65	0.65	0.73	0.74

Notes:

a) The *Africa* and *East Asia Dummy Variables* are indicators that equal 1 if the country is in respective region, and 0 otherwise. The inclusion of these indicators is based on the hypothesis that all countries in a geographic area share some region-specific characteristics that affect economic growth.

b) Following Barro (33), *Fraction Confucian* is the proportion of the population indicating Confucianism as primary religion.

c) The constant represents the intercept of the fitted regression line.

Robust standard errors in parentheses

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

In column 1 of Table 2, we show the results for a model with their nine best predictors, plus the initial fraction of the population living in urban areas. We estimate a negative, but statistically insignificant, effect of urban population share. In column 2, we allow for a

non-linear relationship between income and urban population share (using a squared term) and for the optimal level of urbanization to depend on the level of income (using an interaction term between income and urban population share). The results in column 2 are similar to those in column 1: none of the terms that include urban population share have a statistically significant effect on future economic growth, either individually or jointly.

We wish to assess the robustness of these growth regression results. There are two factors that might change the results. First, low-income countries may be different from other countries; and second, changing the set of covariates used in the growth regression may change the estimated effect of urban population share. In columns 3 and 4 of Table 2 we repeat the growth regression exercise for low-income countries as defined by the World Bank. This gives somewhat different estimates, and has less precision since the sample size is smaller, but again we find no effect of the level of urban population share on economic growth.

In Table 3a we report the coefficient of urban population share for a number of regressions with different sets of covariates. We start with just urban population share and initial income, a specification similar to that used in Table 1, but now without country fixed effects. We then examine the effect of adding sequentially the 5, 9, and 16 covariates that provide the best prediction of economic growth as found by SDM (32). In none of these regressions is urban population share statistically significant. In Table 3b we repeat the exercise for low- and middle-income countries and find the same lack of significance.

Table 3a: Robustness Checks Table: Full Sample

Model	Dependent Variable: Average Annual Growth 1970-2000			
	(1) <i>Lagged GDP Only</i>	(2) <i>SDM 5</i>	(3) <i>SDM 9</i>	(4) <i>SDM 16</i>
Urban population share 1970	0.00917 (0.016)	0.00621 (0.014)	-0.0130 (0.011)	-0.0105 (0.013)
Observations	78	78	78	78
R-squared	0.04	0.55	0.68	0.74

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3b
Robustness Checks Table: Low- and Middle-Income Countries Only

Model	Dependent Variable: Average Annual Growth 1970-2000			
	(1) <i>Lagged GDP Only</i>	(2) <i>SDM 5</i>	(3) <i>SDM 9</i>	(4) <i>SDM 16</i>
Urban population share 1970	0.00179 (0.021)	-0.0144 (0.021)	-0.0231 (0.019)	-0.0266 (0.020)
Observations	55	55	55	55
R-squared	0.00	0.52	0.66	0.73

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Overall, our results imply that countries with a higher degree of initial urban population share do not experience any faster or slower economic growth than countries with a low degree of initial urban population share. Moreover, this result appears quite robust with respect to the specification of the growth model. Taken together, none of our empirical tests provide support for the view that urban population share has a causal effect on the level of income. Although urbanization is part of the process of economic development, it does not appear to have an independent influence on economic growth (33).

Different Types of Urbanization

Understanding the process of rural-to-urban migration is central to understanding the effects of urbanization. There are several distinct channels through which urbanization can occur. The first involves the movement of people from rural to urban areas. Empirically, migration is estimated to contribute on average between 40 and 50 percent of total urban population growth (34, 35). Second, the rate of natural population increase may be different in urban and rural areas, due to differences in birth and death rates. Birth rates are usually lower in urban than rural settings, but mortality rates are often lower as well. The third important channel is the reclassification of rural settlements as urban as a result of rural population growth and increasing population density; a person can become “urbanized” while standing still.

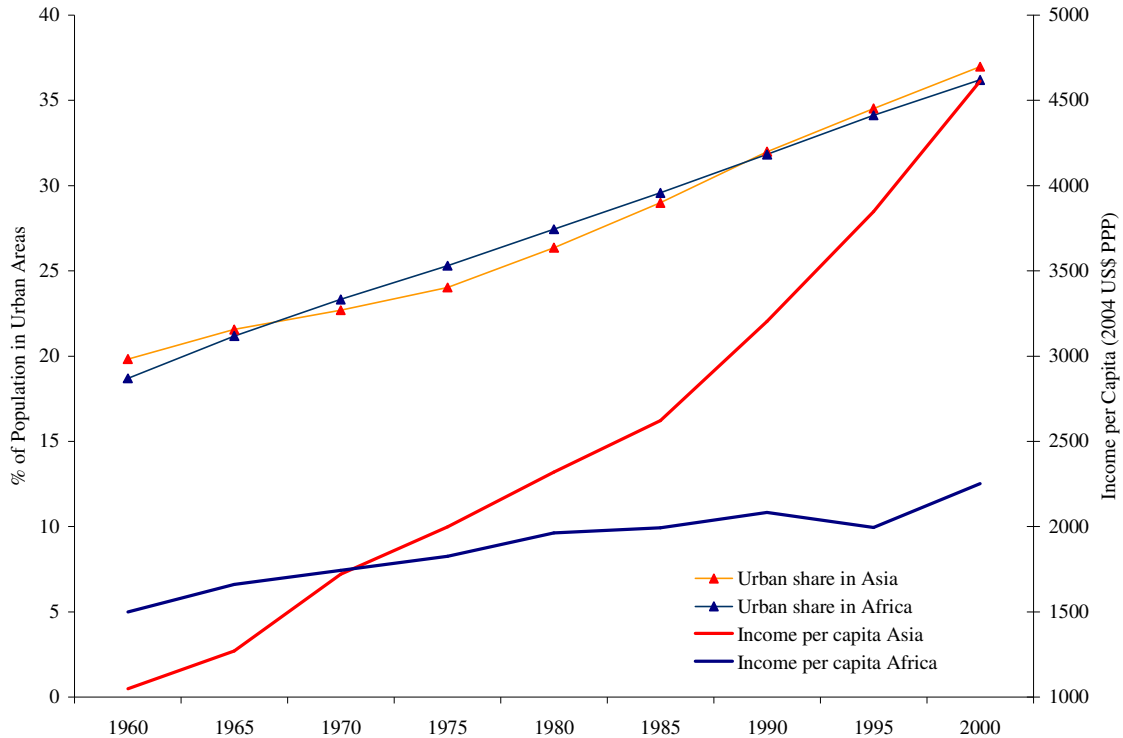
Although migration can be triggered by increased demand for labor in urban areas, blooming economies are not the only cause of urban migration. Political instability within countries has led to major refugee flows toward cities like Kinshasa (Democratic Republic of the Congo) and Karachi (Pakistan). Natural disasters, such as extended droughts and floods, have destroyed the economic basis of rural life in several regions in the developing world and induced major population flows toward the cities in countries like Angola, Ethiopia, and Mauritania (36). Even in the absence of natural disasters, economic conditions in the countryside – sometimes brought about by policies that favor city dwellers – can push rural residents to cities that, in the long run, offer them little in the way of economic sustenance. In such cases, cities may grow rapidly in population without being economic "success stories".

One possible explanation for the absence of an empirical link running from urban population share to income per capita lies in the different types of urbanization observed across countries or continents. Although the share of the population living in urban areas has risen from slightly below 20% to a level around 36% in both Asia and Africa between 1960 and 2000 (Figure 2), per capita income has increased 340% in Asia compared with only 50% in Africa. If the initial level of urbanization were the key factor in economic growth we would have expected both regions to grow at about the same rate since they had about the same urban population share. If we thought that urban population share simply follows the level of income, Asia should have urbanized much more quickly than Africa given its superior growth performance – but again this was not observed. Rather, it appears that urbanization in Asia has been driven mostly by industrialization and a plethora of job opportunities in urban areas (37), whereas urbanization in Africa seems to be more the result of population pressure, civil conflict, and changing political regimes (24) as well as ethnic tensions and a momentum effect (38) .

The fact that rapid urbanization has gone hand in hand with economic growth in Asia, while proceeding just as rapidly but without growth in Africa, is perhaps surprising. However, it is a common pattern that, over long periods of time, development indicators can move in quite different directions (31). Development is a multifaceted process and

economic growth, or the absence thereof, is not a strong indicator of progress in other dimensions of development.

Figure 2: Urban Population Share and Income in Asia and Africa



Although the share of the total population living in urban areas seems to have little effect on economic growth, it may be that other measures of urban composition do matter. Primacy, the portion of the urban population living in the largest city, or urban concentration, the proportion of urban dwellers living in large cities, may affect economic growth, though the size of these effects appears to be highly non-linear (26, 27). Primacy and urban concentration are measures of the distribution of the urbanized population between small and large cities, and in practice have a very low correlation with the level of urban population share of the overall population that we investigate here.

The Bottom Line

Urban development is important; with a majority of the world population living in urban areas, well-functioning cities will be one of the key factors in the ongoing battle against poverty (39). However, it appears that urbanization is more an indicator than an instrument of economic development. Our findings imply that policies specifically aimed at accelerating, or retarding, urbanization are unlikely to speed up economic development. Even though regional urban areas and success stories like the Silicon Valley or Bangalore are key drivers of economic growth, the notion that a larger fraction of a country's population living in urban areas improves economic performance does not seem to have empirical support. Policy-makers who hope to increase the long-term economic growth of their countries by supporting, or inhibiting, urbanization, are likely to miss their target.

Notes and References

1. The authors are grateful to the editor, Mark Montgomery, Larry Rosenberg, and two anonymous referees for their comments and suggestions.
2. United Nations, *World Population Prospects: The 2004 Revision. CD-ROM Edition - Extended Dataset* (United Nations, 2005), pp.
3. C. M. Becker, in *International Handbook of Development Economics* A. Dutt, J. Ros, Eds. (2007).
4. UN-HABITAT/DFID, *UN-HABITAT/DFID Nairobi* (2002).
5. UN-HABITAT, *State of the World's Cities 2006/7*. UN-HABITAT, Ed. (Earthscan Publications Ltd., London, 2007), pp.
6. M. Lipton, *Why Poor People Stay Poor: Urban Bias in World Development* (Temple Smith, London, 1977), pp.
7. M. Lipton, *Journal of Development Studies* **29**, 229 (1993).
8. M. Lipton, in *Development and the Rural-Urban Divide* J. Harriss, M. Moore, Eds. (Frank Cass, London, 1984).
9. Y. W. Bradshaw, E. Fraser, *American Sociological Review* **54**, 986 (1989).
10. A. Ciccone, R. Hall, *American Economic Review* **86**, 54 (1996).
11. R. Becker, J. V. Henderson, in *The Economics of Cities* J. M. Huriot, J. F. Thisse, Eds. (Cambridge University Press, 2000).
12. H. Abdel-Rahman, M. Fujita, *Journal of Regional Science*, 165 (1990).
13. A. K. Dixit, J. E. Stiglitz, *American Economic Review*, 297 (1977).
14. M. Fujita, H. Ogawa, *Paper prepared for Prince Bertil Symposium on the Dynamic Firm, Stockholm* (1982).
15. J. E. Rauch, *Journal of Urban Economics*, 380 (1993).
16. A. Caplin, J. Leahy, *Economic Journal*, 62 (1998).
17. P. Krugman, *Journal of Political Economy*, 483 (1991).
18. D. Black, J. V. Henderson, *Journal of Political Economy*, 252 (1999).
19. M. R. Montgomery, R. Stren, B. Cohen, H. E. Reed, Eds., *Cities Transformed: Demographic Change and Its Implications in the Developing World* vol. 273 (National Academies Press, Washington D.C., 2003).
20. J. G. Williamson, *Economic Development and Cultural Change* **13**, 3 (1965).
21. A. Heston, R. Summers, B. Aten, *Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania* (2006).
22. United Nations, *World Urbanization Prospects: The 2005 Revision Population Database*. U. Nations, Ed. (New York, 2006), pp.
23. D. E. Bloom, D. Canning, G. Fink, T. Khanna, P. Salyer, *WIDER Conference Paper* (2007).
24. D. Satterthwaite, *IIED Human Settlements Discussion Paper Urban Change* **4** (2007).
25. SEDAC. (Center for International Earth Science Information Network (CIESIN), Columbia University, 2007), vol. 2007.
26. L. Bertinelli, E. Strobl, *CREDIT Research Paper* **03/14** (2003).
27. J. V. Henderson, *Journal of Economic Growth*, 47 (2003).
28. C. W. J. Granger, *Econometrica* **37**, 424 (1969).

29. Because the relationship between urbanization and income is nonlinear, we use the natural logarithm of income per capita in our empirical specification, which does result in a linear relationship. Note that the change over time in the natural logarithm of income is the rate of economic growth.
30. The inclusion of country fixed effects implies that the empirical analysis abstracts from all factors that are constant within a given country over the entire sample period. Similarly, the inclusion of time fixed effects implies that the empirical analysis abstracts from all factors that affect all countries equally in a given year.
31. W. Easterly, *Journal of Economic Growth* **4**, 239 (1999).
32. X. Sala-i-Martin, G. Doppelhofer, R. I. Miller, *American Economic Review* **94**, 813 (2004).
33. In addition to urban population share we also considered primacy: the fraction of the urban population living in the country's most populated city. The inclusion of the primacy variable did not change any of our empirical results.
34. N. Keyfitz, *Geographical Analysis* **12**, 142 (1980).
35. S. H. Preston, *Population and Development Review* **5**, 195 (1979).
36. United Nations. (Office for the Coordination of Humanitarian Affairs, 2007).
37. G. Hugo, in *African Migration and Urbanization in Comparative Perspective* M. Tienda, S. Tollman, E. P. Whyle, Eds. (Princeton University Press, Princeton, 2007).
38. M. Fay, C. Opal, in *Policy Research Working Paper Series No. 2412*. (World Bank 2000).
39. UNFPA, *UNFPA, New York* **45** (2007).
40. G. S. F. Bruno, *Economics Letters* **87**, 361 (2005).