NOT FOR PUBLICATION: WEB APPENDICES

Demography, Urbanization and Development: Rural Push, Urban Pull... and Urban Push?

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NOT FOR PUBLICATION: WEB THEORY APPENDIX

Urban Natural Increase and the Speed of Urbanization

Summary: *This Web Theory Appendix shows in a calibration exercise that faster changes in urbanization are indeed mechanically associated with higher urban rates of natural increase ceteris paribus. Rural natural increase then mechanically lowers urbanization rates.*

The urbanization rate at the start of year t, U_t, is the ratio of the urban population $Upop_t$ to the total population Pop_t. The change in urbanization in year t can be expressed as:

$$\triangle U_t = U_{t+1} - U_t = \frac{Upop_{t+1}}{Pop_{t+1}} - \frac{Upop_t}{Pop_t} = \frac{Upop_{t+1}}{Pop_{t+1}}\frac{Pop_t}{Pop_t} - \frac{Upop_t}{Pop_t}\frac{Pop_{t+1}}{Pop_{t+1}} \tag{1}$$

$$\triangle U_t = \frac{Upop_{t+1}(Upop_t + Rpop_t)}{Pop_t Pop_{t+1}} - \frac{Upop_t(Upop_{t+1} + Rpop_{t+1})}{Pop_t Pop_{t+1}} \tag{2}$$

$$\triangle U_t = \frac{Rpop_t Upop_{t+1}}{Pop_t Pop_{t+1}} - \frac{Upop_t Rpop_{t+1}}{Pop_t Pop_{t+1}} = (1-U_t)\frac{Upop_{t+1}}{Pop_{t+1}} - U_t\frac{Rpop_{t+1}}{Pop_{t+1}} \tag{3}$$

Substituting equations (3) and (4) into equation (8), and noting that $\triangle Pop_t = Nni_t * Pop_t$ with Nni_t the national rate of natural increase in year t, and Pop_t the total population at the start of year t, we obtain:

$$\triangle U_t = (1-U_t)\frac{(1+Uni_t)Upop_t + Mig_t}{(1+Nni_t)Pop_t} - U_t\frac{(1+Rni_t)Rpop_t - Mig_t}{(1+Nni_t)Pop_t} \tag{4}$$

$$\triangle U_t = (1-U_t)U_t\frac{1+Uni_t}{1+Nni_t} - U_t(1-U_t)\frac{1+Rni_t}{1+Nni_t} + \frac{Mig_t}{(1+Nni_t)Pop_t} \tag{5}$$

$$\triangle U_t = \frac{U_t}{(1+Nni_t)}[(1-U_t)(Uni_t - Rni_t) + \frac{Mig_t}{Upop_t}] \tag{6}$$

Three insights emerge. First, the change in urbanization is a relative concept and depends on both urban and rural natural increase ($Uni_t - Rni_t$), with the latter mitigating the positive effect of the former. Consequently, rapid urban natural increase can coexist with a relatively slow change in urbanization. Put differently, countries with similar changes in urbanization may be experiencing very different rates of urban growth, if higher rates of urban natural increase are offset to a similar extent by higher rates of rural natural increase. As countries with higher urban natural increase also tend to experience higher rural natural increase (Uni_t and Rni_t tend to be highly correlated) this is not so far-fetched. This contrasts with urban growth, where urban natural increase translates one to one in urban growth (at least in an accounting sense and contemporaneously - see further below). Urban congestion is thus likely also more directly linked to urban growth than to changes in the rate of urbanization, a point we will revisit below.

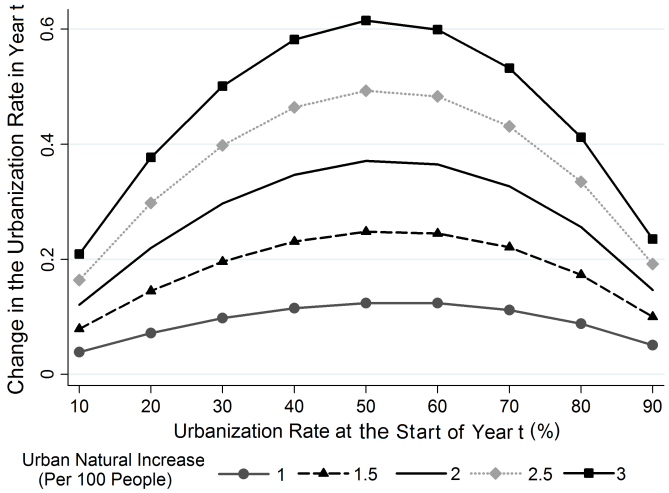
Second, the effect of migration on changes in urbanization tends to be larger than the effect of urban natural increase. Not only is the effect of the latter mitigated by rural natural increase (typically even overturned if Rni_t exceeds Uni_t), it is further conditioned

by the share of the rural population ($(1\text{-}U_t) \leq 1$). From this perspective, it is unsurprising that debates about urbanization (and development) largely ignore demographic factors and focus on migration. The latter affects changes in urbanization most.

Finally, the contribution of urban national increase is conditioned by the nonlinear relationship with the initial level of urbanization U_t. To gauge the effect of urban natural increase, we simulate equation (6) using the following parameters: $Rni = 2.5\%$ and $Mig/Upop = 1.5\%$ per year. These values are inspired by the comparative analysis in section 3.6. $Uni = 0.5\%$ is chosen as the benchmark, to see how raising the urban rate of natural increase to 1, 1.5, 2, 2.5, and 3 alters urbanization for different initial rates of urbanization (see Web Theory Appendix Figure 1). The effects can be large; increasing the urban rate of natural increase from 0.5% to 3% raises the change in urbanization by 0.5 percentage points a year on average. Moreover, the effects of natural increase on the speed of urbanization increase until the initial rate of urbanization approaches 50 percent, after which they decline. The higher speed of urbanization observed in developing countries is thus partly also driven by their low points of departure.

Europe and the four developing areas then widely differed in their urban rates of natural increase. On average, their rural rates of natural increase were much more similar: 2% in Europe and Asia, and 2.5% in other regions. Migration rates were also constant across space and time. In Web Theory Appendix Figure 1, the simulations use the following parameters: $Rni = 2.5\%$ and $Mig/Upop = 1.5\%$. Taking $Uni = 0.5\%$ as a benchmark, we show the results for five values of $Uni = \{1; 1.5; 2; 2.5; 3\}$, given an initial urbanization rate (U). This allows us to compare the potential effects of urban natural increase *ceteris paribus* for East Asia ($Uni \approx 1\%$), Asia (1.5%), the LAC region (2%), the MENA region (2.5%), and Africa (3%), relative to Europe (0.5%). The decadal effects could be large, e.g. 2 points of urbanization for Africa, given an initial urban rate of 10%. Indeed, in the figure, the annual difference in the change in the urbanization rate between $Uni = 3$ (Africa) and $Uni = 1$ (Europe) is about 0.2 for an initial urban rate of 10%. The decadal change should thus be 2 points of urbanization.

Web Theory Appendix Figure 1: Urban Natural Increase and Change in Urbanization Rate, Calibration



Notes: This figure shows the relationship between the change in the urbanization rate in year t (ΔU_t, in percentage points) and the urban crude rate of natural increase in year t (Uni_t, per 100 people), given the initial urbanization rate at the start of year t (U_t). We assume that the rural crude rate of natural increase (Rni_t) = 2.5% and the residual migration rate (Mig_t) = 1.5% per year. We use $Uni = 0.5\%$ as a benchmark. This allows us to compare the "relative" effects of the urban rate of natural increase on the change in the urbanization rate for various relatively higher values of $Uni = \{1; 1.5; 2; 2.5; 3\}$.

NOT FOR PUBLICATION: WEB DATA APPENDIX

Summary: *This Web Data Appendix describes in details the data we use in our analysis.*

Sample Selection for Industrial Europe and Today's Developing World:

We use three different samples in our analysis. First, we obtain historical urban data for 19 European and North American countries from 1700-1950, and 116 Africa, Asian or non-North American countries that were still developing countries in 1960, from 1960-2010. We exclude from our analysis the European and Neo-European countries for which we could not find historically consistent urban data, as well as the former CIS countries. We use these countries to describe urban patterns in "Industrial Europe" (which also includes a Neo-European country, the United States) and four developing areas: Sub-Saharan Africa (which we call "Africa"), Asia, Latin America and the Caribbean (LAC), and Middle-East and North Africa (MENA). Second, our main sample consists of 40 of these countries from 1700 to 2010. These are the countries for which we found historical demographic data. Historical consistent data was not found for other countries. The list of countries and years (or periods) for which we have data is reported in Web Appendix Tables 1, 2 and 3. These countries belong to the five developing areas: Industrial Europe (N = 7, about every 40 years in 1700-2010), Africa (N = 10, every ten years in 1960-2010), Asia (N = 12, ditto), LAC (N = 8, ditto) and MENA (N = 5, ditto). Third, we also collect cross-sectional data for 97 out of the 116 developing countries in 1960 for which we were to able to find demographic data, for the most recent period. The countries of Africa, Asia, the LAC and MENA regions are then classified into 13 regions: Central Africa, Eastern Africa and Western Africa for Africa; East Asia, Pacific Islands, South Asia and South-East Asia for Asia; Caribbean, Central America and South America for the LAC region; and Middle-East and North Africa for the MENA region.

Urban and Rural Growth and Urbanization Rates in Industrial Europe:

The annual urban growth rate is the average growth rate of the urban population between two years (%). The annual rural growth rate is the average growth rate of the rural population between two years (%). The urbanization rate is defined as the share of the urban population in total population (%). We use Bairoch (1988) and Malanima and Volckart (2007) to reconstruct consistent annual urban growth rates and urbanization rates for 18 Western European countries and the United States for the following periods: 1700-1750, 1750-1800, 1800-1850, 1850-1910 and 1910-1950. Averages are estimated using the population weights for the same period. We consider 7 countries in our main urban demographic analysis (listed in Web Appendix Table 1), as consistent historical demographic data could not be found for the 12 other countries.

Urban and Rural Growth and Urbanization Rates in Today's Developing World:

We reference Bairoch (1988), Sluglett (2008) and WUP (2011) to reconstruct the average annual urban growth rates (%) and urbanization rates (%) for Africa, Asia and the LAC and MENA regions for the following periods: 1900-1920, 1920-1930, 1930-1950, 1950-1960, 1960-1970, 1970-1980, 1980-1990, 1990-2000 and 2000-2010. For the last six decades (post-1950), we use data for 116 African, Asian and non-North American countries. Averages are estimated using the population weights for the same period. We only consider 35 countries in the panel analysis from

1960-2010 (listed in Web Appendix Table 2). We then consider 97 out of the 116 countries for the cross-sectional analysis from 1960-2010. We use WUP (2011) and WB (2013) to estimate the average annual growth rate (%) of the largest city of each country between 1960 and 2010.

Urban and Rural Demographic Transitions in Industrial Europe:

For each of the 7 countries of Industrial Europe, we use various historical sources to obtain the national, urban and rural crude rates of birth, crude rates of death and crude rates of natural increase (per 1,000 people) for several decades during the 1800-1910 period (sources listed in Panel A, Web Appendix Table 3). For England, our main country of analysis, we have data from 1700 to 1950. For the other countries, demographic data exists for shorter periods, as this type of data was not systematically collected by the official authorities before the 19th century.

Urban and Rural Demographic Transitions in Today's Developing World:

For each of the 35 countries of today's developing world, we use reports from the *Population and Housing Censuses*, *CICRED Monographs*, *Fertility Surveys*, and *Demographic and Health Surveys* (DHS) as well as the *Statistical Yearbooks* of the United Nations, to obtain the national, urban and rural crude rates of birth, crude rates of death and crude rates of natural increase (per 1,000 people) for each decade during the 1960-2010 period (sources listed in Panel B, Web Appendix Table 3).[1] We could not find consistent historical demographic data for other countries. Indeed, demographic data does not always exist for countries as far back as the 1960s. For 62 other countries of today's developing world, we use reports from the *Population and Housing Censuses* and *Demographic and Health Surveys* to obtain an estimate of the urban and rural crude rates of birth and death for the closest year to 2000, in the 1990-2010 interval. For the $35 + 62 = 97$ countries, we also used the same sources to retrieve the urban total fertility rate (TFR) for the closest year to 2000, in the 1990-2010 interval. For 89 countries, we used the same sources to obtain the urban share of women in reproductive age (15-49 year-old, as a % of the total population) for the closest year to 2000, in the 1990-2010 interval. Data on the urban child mortality rates (0-5 years) for the closest year to 2000, in the 1990-2010 interval, was obtained from the *Demographic and Health Surveys* (DHS). Lastly, for 94 countries, we also use the sources mentioned above to obtain the birth rate of the largest city for the closest year to 2000, in the 1990-2010 interval. Data on the crude death rate of the largest city does not exist, as it is not systematically collected or reported by the official authorities of these countries.

Data for the Instrumental Variables:

Data on the population shares (%) of "Catholicism", "Protestantism", "Other Christian Religions", "Islam", "Hinduism", "Buddhism", "Other Eastern Religions", and "Other Religions" for the 1960s come from Barro and McCleary (2003). They mostly rely on survey data from the 1960s but label this round of data as "1970". Data on the "Family Planing Effort" (FPE) index (from 0 to 100) for the 1960s comes from Ross and Mauldin (1996). They mostly rely on observations from the late 1960s, but label this round of data "1972" in their analysis. The two data sets allow us to observe the initial cultural and policy conditions in our 35 developing countries.

[1] While some of these sources could easily be found on the internet (in PDF), we found most of them at the Library of Congress in Washington D.C. and the libraries of the London School of Economics and Political Science (LSE) in London and the Centre Population et Développement (CEPED) in Paris.

Measures of Urban and Rural Congestion:

Data on the share of the urban population living in slums (%) comes from UN-Habitat (2003), UN (2013) and WB (2013). A slum household is usually defined as a group of individuals living under the same roof lacking one or more of the following conditions (UN-Habitat 2003): (i) sufficient-living area, (ii) structural quality, (iii) access to improved water source, and (iv) access to improved sanitation facilities. We have data for 113 countries in total, but we only focus on 95 countries for which we also have data on urban natural increase in 2000. Data is available for a lower number of countries for some subcomponents of the slum variable. UN-Habitat (2003) reports the share of urban residents that lack "sufficient-living area" (%), i.e. who live in dwelling units with more than 3 persons per room. We use as a measure of "structural quality" the shares of urban and rural inhabitants who live in a residence with a finished floor (%). We reconstruct these variables using the *International Public-Use Microdata Series* (IPUMS, 2013) and the stat compiler of the *Demographic and Health Surveys* (DHS, 2013). Data on the shares of urban and rural inhabitants who have access to an improved water source and improved sanitation facilities (%) come from WB (2013). A household is considered to have access to an improved water source if it has sufficient amount of water for family use, at an affordable price, available to household members without being subject to extreme effort, especially to women and children. A household is considered to have access to improved sanitation, if an excreta disposal system is available to household members. Data on the respective shares of urban and rural inhabitants using solid fuels (e.g., coal and wood) as their main source of energy comes from WHO (2010). Data on the urban and rural child dependency ratios (%), the urban and rural aged dependency ratios (%), the urban and rural total dependency ratios (%), and the urban and rural shares of 6-15 year-old children that are currently attending school (%) were recreated using the DHS (2013), IPUMS (2013), various census reports, and Wikipedia (2013), for each country. The urban (rural) child dependency ratio is the ratio of the number of urban (rural) residents aged 0-14 over the number of urban (rural) residents aged 15-64 x 100. The urban (rural) aged dependency ratio is the ratio of the number of urban (rural) residents aged 65-+ over the number of urban (rural) residents aged 15-64 x 100. The urban (rural) total dependency ratio is the ratio of the number of urban (rural) residents aged 0-14 or 65-+ over the number of urban (rural) residents aged 15-64 x 100. Data on our measure of particulate matter (PM) concentrations in residential areas of cities with more than 100,000 residents comes from WB (2013). Data on the urban (rural) employment structure in selected countries for 2000-2010 was recreated using various sources, as described for each country in Gollin, Jedwab and Vollrath (2015). Their two main data sources are IPUMS (2013), the *International Public-Use Microdata Series*, and ILO (2013), the International Organization of Labor. They complement these datasets with data from the published reports of *Population and Housing Censuses, Labor Force Surveys and Household Surveys*. For each country for which data is available, they estimate the employment shares (%) of all urban (rural) areas for the following 11 sectors: "agriculture", "mining", "public utilities", "manufacturing", "construction", "wholesale and retail trade, hotels and restaurants", "transportation, storage and communications", "finance, insurance, real estate and business services", "government services", "education and health" and "personal and other services" (our sector of analysis, since it often works as an urban refugee sector). As already explained above, we use the same sources to recreate the same measures of congestion for the

rural sector only in 2000-2010. Data is missing for three measures then: sufficient-living area, particulate matter (PM) concentrations and the employment share of the rural refugee sector, which is not necessarily the "personal and other services" sector. We also have data for a fewer number of observations for the rural sector than for the urban sector.

Per Capita GDP and Other Controls:

We use Maddison (2008) and WB (2013) to reconstruct a consistent series of GDP per capita for each country every ten years for 1960-2010. The main variable used in our analysis is average log GDP per capita for each decade (in constant 2005 international $, which is the base used by WB (2013)). We use various sources to reconstruct a range of time-invariant or time-varying controls at the country-level. In the panel regressions, we include the time-varying controls (estimated in the same or previous decade). In the cross-sectional regressions, we also include the time-invariant controls (the time-varying controls are estimated for 1960-2010 instead of for the same or previous decade). Most of these controls were initially constructed by Gollin, Jedwab and Vollrath (2015). First, we consider various rural push factors: (i) FAO (2013) reports the cereal yields (hg per ha) for each country-year observation. We then estimate the average yields for each decade; (ii) Rural density is defined as the ratio of rural population (1000s) to arable area (sq km). The arable area of each country is reported by FAO (2013); (iii) CRED (2013) reports the number of droughts experienced by each country every year. We use two variables: the number of droughts (per sq km) since 1960, and the number of droughts (per sq km) for each decade (e.g., 1960-1969 for the 1960s); and (iv) The Polity IV data series includes a measure of political violence for each country (1964-present). We create an indicator whose value is one if the country experienced an interstate or civil conflict in each decade (Polity IV 2013a). Second, we consider various urban pull factors: (i) The share of manufacturing and services in GDP (%) in 2010 is obtained from WB (2013). The data is missing for many country-year observations before the recent period; (ii) We use the data set of Gollin, Jedwab and Vollrath (2015) to obtain the average share of natural resource exports in GDP (%) for each decade; (iii) We use the Polity IV data series to calculate the average combined polity score for each country for each decade (Polity IV 2013b). We create an indicator whose value is one if the average polity score is lower than -5, the threshold for not being considered autocratic; and (iv) From WB (2013), we know the share of the largest city in the urban population, the primacy rate, for all years in 1960-2010. Third, we use the other following controls: (i) The 97 countries use four different types of urban definition in their most recent censuses: (a) "administrative cities" are administrative centers of territorial units (e.g., provinces, districts, etc.), (b) "threshold cities" are localities whose population is greater than a population threshold of X inhabitants (e.g.,5,000 or 2,500), (c) "administrative or threshold cities" are either administrative centers or localities whose population is greater than a population threshold, and (d) "threshold with condition cities" are localities whose population is greater than a population threshold and who have a large share of the labor force engaged in non-agricultural activities. We create dummies for each definition. For each country using a population threshold, we know the threshold and use it as a control in our regressions; and (ii) We create two dummies equal to one if the country is a small island or if the country is landlocked. We consider an island country small if its area is smaller than 50,000 sq km.

Web Data Appendix References

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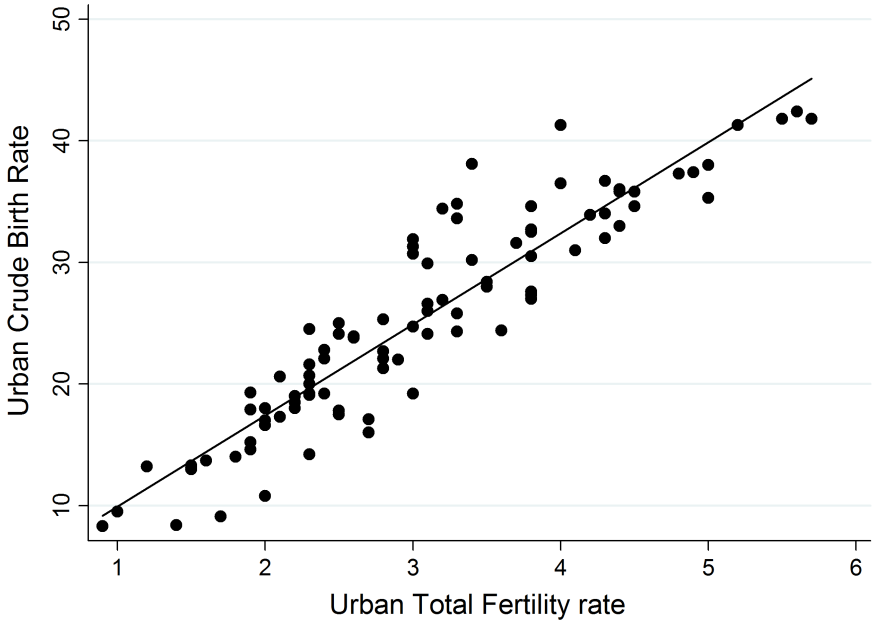
NOT FOR PUBLICATION: WEB APPENDIX FIGURES

Web Appendix Figure 1: Urban Crude Rates of Birth and Urban Total Fertility Rates for 97 Developing Countries in 2000

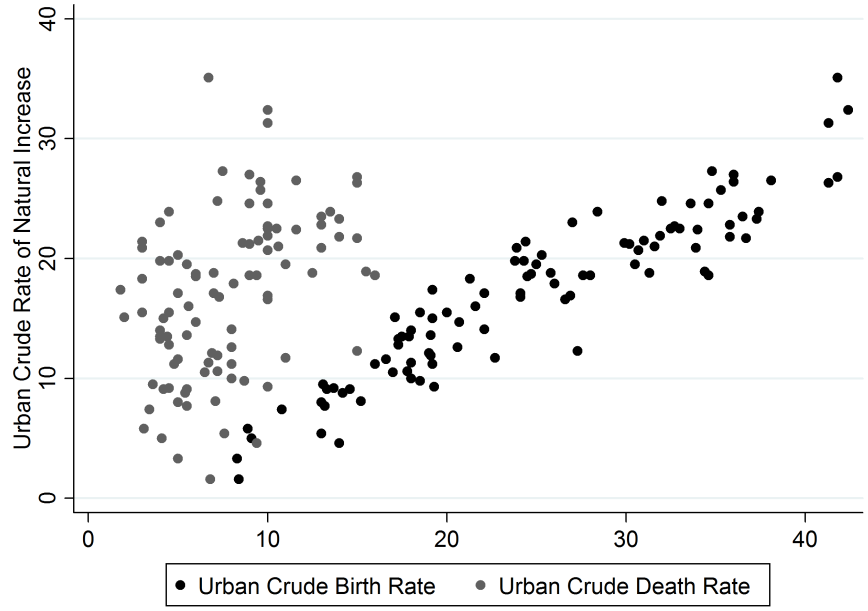


***Notes*: This figure shows the high correlation (rho = 0.93) between the urban crude birth rate and the urban total fertility rate for 97 developing countries in 2000.** We use data for 97 countries that were still developing countries in 1960, for the closest year to the year 2000 (in the 1990-2010 period). The linear fit is plotted for the relationship between the urban crude birth rate (per 1,000 people) and the urban total fertility rate (the average number of children born to a woman over her lifetime). The coefficient of correlation between the two is 0.93. See Web Appendix for data sources.

Web Appendix Figure 2: Urban Crude Rates of Death and Urban Child Mortality Rates for 70 Developing Countries in 2000

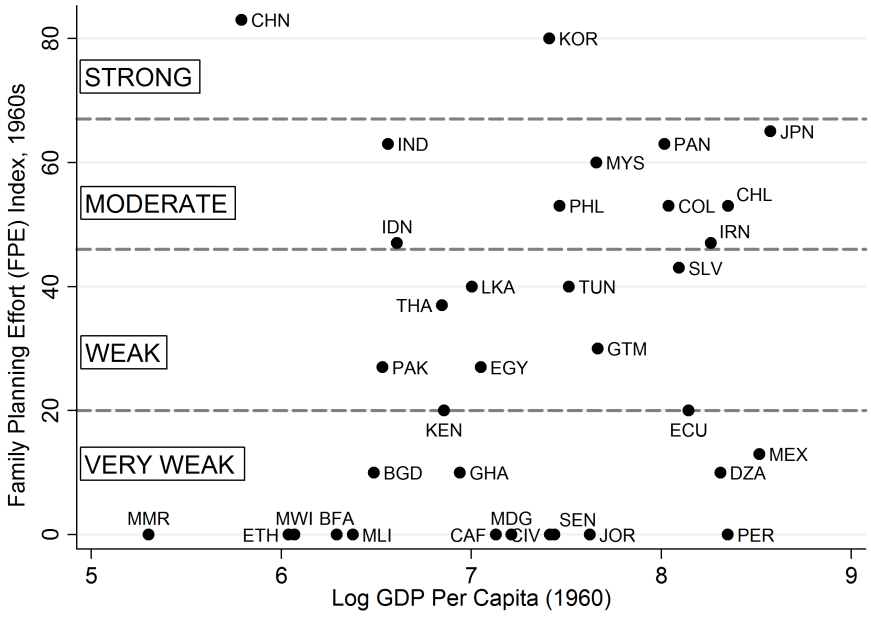
***Notes*: This figure shows the high correlation (rho = 0.81) between the urban crude death rate and the urban child mortality rate (0-5 years) for 70 developing countries in 2000.** We use data for 70 countries that were still developing countries in 1960, for the closest year to the year 2000 (in the 1990-2010 period). The linear fit is plotted for the relationship between the urban crude death rate (per 1,000 people) and the urban child mortality rate (0-5 years, per 1,000 live births). The coefficient of correlation between the two is 0.81. See Web Appendix for data sources.

Web Appendix Figure 3: Urban Crude Rates of Birth, Death and Natural Increase for 97 Developing Countries in 2000



***Notes*: This figure shows that the urban crude rate of natural increase is highly correlated with the urban crude rate of birth (rho = 0.93), while the urban crude rate of death does not vary as much across countries (rho = 0.42).** We use data for 97 countries that were still developing countries in 1960, for the closest year to the year 2000 (in the 1990-2010 period). The coefficients of correlation between the urban crude rate of natural increase (per 1,000 people) and the urban crude rates of birth and death (per 1,000 people) are 0.93 and 0.42 respectively. See Web Appendix for data sources.

Web Appendix Figure 4: Family Planning Effort Index and Log Per Capita GDP for 35 Developing Countries in the 1960s



***Notes*: This figure allows us to identify the countries that had "idiosyncratically" (here conditional on initial income in 1960) implemented in the 1960s a family planning policy (high FPE index) or a pronatalist policy (low FPE index) among the 35 developing countries of the panel analysis.** We show the correlation between the family planning effort index in the 1960s (the lower the FPE index the more pronatalist the policy is) and log per capita GDP in 1960 (constant 2005 international $) for the 35 countries that were still developing countries in 1960 and that we use in our panel analysis. The coefficient of correlation between the two is 0.28. Ross and Maudlin (1996) define 4 categories of family planing policies: *very weak* ($0 \leq$ FPE ≤ 19), *weak* ($20 \geq$ FPE ≤ 45), *moderate* ($46 \leq$ FPE ≤ 66) and *strong* ($67 \leq$ FPE ≤ 100). See Web Appendix for data sources.

NOT FOR PUBLICATION: WEB APPENDIX TABLES

WEB APPENDIX TABLE 1: NATURAL INCREASE SOURCE INFORMATION BY COUNTRY

COUNTRY	YEARS	MAIN SOURCES
		See the excel files "Demographic_Data_X.xls" for the main sources used for each country-year (X = {*Africa*, *Asia*, *Europe*, *LAC*, *MENA*})
Panel A:		**Historical Data for Industrial Europe (N = 7, 1700-1950)**
Belgium	1866-1905	(i) *Annuaires Statistiques de la Belgique. Belgium. Ministere de l'Interieur.* 1907. Bruxelles: Etablissements Généraux de la Belgique.
England	1700-1950	(i) Newsholme, A. (1911). *The Declining Birth Rate, Its National and International Significance*. London: Cassell & Company Limited; (ii) Landers, J. (1993). *Death and the Metropolis: Studies in the Demographic History of London, 1670-1830*. Cambridge, Cambridge University Press. (iii) Friedlander, D. (1969). Demographic Responses and Population Change, *Demography* 6 (4): 359-381; (iv) Williamson, J. (1990). *Coping with City Growth During the British Industrial Revolution*. Cambridge: Cambridge University Press.
France	1853-1910	(i) *Statistique Annuelle du Mouvement de la Population. France. Statistique Generale.* 1901, 1912. Paris: Imprimerie Nationale.
Germany	1811-1926	(i) Weber, A. (1899). *The Growth of Cities in the 19th Century.* New York: The MacMillan Company; (ii) Stedman, T. (1904). *Medical Record.* New York: William Wood and Company; (iii) Pollock, H., and W. Morgan (1913). *Modern Cities: Progress of the Awakening for Their Betterment Here and in Europe.* New York: Funk & Wagnalls Company; (iv) Holmes, S. (1921). *A Study of Present Tendencies in the Biological Development of Civilized Mankind.* New York: Harcourt, Brace and Company; (v) Knodel, J. (1974). *The Decline of Fertility in Germany, 1871-1939*. Princeton, New Jersey: Princeton University Press. (vi) Galloway, P., Lee, R., and E. Hammel (1998). Urban vs. Rural: Fertility Decline in the Cities and Rural Districts of Prussia, 1875 to 1910. *European Journal of Population* 10/1998; 14(3):209-64. (vii) Vogele, J. (2000). Urbanization and the Urban Mortality Change in Imperial Germany. *Health & Place* 6: 41-55.
Netherlands	1815-1909	(i) Sanger, M. (1917). *The Case for Birth Control.* Modern Art Printing Company; (ii) Oeppen, J.E. , and M.H.D. van Leeuwen (1993). "Estimating the Demographic Regime of Amsterdam, 1681-1920." *Economic and Social History in the Netherlands* 5, 61-102. Cambridge: Cambridge University Press; (iii) Wintle, M. (2004). *An Economic and Social History of the Netherlands, 1800-1920: Demographic, Economic and Social Transition.* Cambridge: Cambridge University Press.
Sweden	1750-1946	(i) Dyson, T. (2011), The Role of the Demographic Transition in the Process of Urbanization. *Population and Development Review*, 37: 34-54.
United States	1800-1940	(i) Various census Reports; (ii) Report on vital and social statistics in US at 11th Census, 1890. Washington DC: U.S. Census Bureau. (iii) Statistical Abstract of the United States. 1933. Washington DC: U.S. Census Bureau. (iv)Statistical Abstract of the United States. 1941. Washington DC: U.S. Census Bureau.(v) Duffy J. (1968). *A History of Public Health in New York City, 1625-1866*. New York: Russell Sage; (vi) Rosenwaike, I. (1972). *Population History of New York City*. Syracuse: SU Press; (vii) Haines, M. (2001). The Urban Mortality Transition in the United States, 1800-1940. *Annales de Demographie Historique* 101: 33-64; (viii) Haines, H. (2008). *The Population of the United States, 1790-1920*. Cambridge: Cambridge University Press; (ix) Ferrie, J.P., and W. Troesken (2008). Death and The City: Chicago's Mortality Transition, 1850-1925. *Explorations in Economic History*, 45, 1: 1-16.

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COUNTRY	YEARS	MAIN SOURCES
		See the excel files "Demographic_Data_X.xls" for the main sources used for each country-year (X = {*Africa*, *Asia*, *Europe*, *LAC*, *MENA*})
Panel B:	**Historical Data for Today's Developing World (N = 35, 1960-2010)**	
Algeria	1969, 1970, 1986, 1994, 2006	Demographic Survey (Report), Multiple Indicator Cluster Surveys (Report)
Bangladesh	1965, 1974, 1985, 1993-1994, 2004	UN Statistical Yearbook, Population and Housing Census (Report), CICRED Monograph, Demographic and Health Survey (Report)
Burkina-Faso	1960-61, 1975, 1985, 1996, 2006	Demographic Survey (Report), Population and Housing Census (Report)
Central Afr. Rep.	1960, 1975, 1988, 1994-1995, 2003	Demographic Survey (Report), Population and Housing Census (Report), Demographic and Health Survey (Report)
Chile	1960, 1970, 1983, 1995, 2006	UN Statistical Yearbook, CICRED Monograph
China	1965, 1975, 1985, 1995, 2000	Population and Housing Census (Report), Historical Studies
Colombia	1962-1964, 1973, 1985-1986, 1990, 2000	UN Statistical Yearbook, Population and Housing Census (Report), Demographic and Health Survey (Report), CICRED Monograph
Côte d'Ivoire	1965, 1975, 1988, 1994, 1998	Population and Housing Census (Report), Demographic and Health Survey (Report)
Ecuador	1968, 1974, 1985, 1993, 2005	UN Statistical Yearbook, Demographic and Health Survey (Report)
Egypt	1962, 1975, 1985, 1996, 2006	UN Statistical Yearbook, CICRED Monograph
El Salvador	1965, 1975, 1985, 1996, 2006	UN Statistical Yearbook
Ethiopia	1964-67, 1974, 1984, 1994, 2000	Population and Housing Census (Report), Demographic and Health Survey (Report), Demographic Survey (Report)
Ghana	1960, 1970, 1984, 1993, 2000-2003	Population and Housing Census (Report), Demographic and Health Survey (Report), CICRED Monograph
Guatemala	1965, 1975, 1980, 1992, 1998-1999	UN Statistical Yearbook, Demographic and Health Survey (Report)
India	1961, 1970, 1985, 1989, 2005	UN Statistical Yearbook, CICRED Monograph
Indonesia	1961-1971, 1971-1975, 1985, 1993, 2003	Demographic and Health Survey (Report), CICRED Monograph
Iran	1968, 1975, 1986, 1990, 2005	UN Statistical Yearbook
Japan	1965, 1975, 1985, 1995, 2005	UN Statistical Yearbook
Jordan	1965-1970, 1974, 1990, 1997, 2002	UN Statistical Yearbook, CICRED Monograph
Kenya	1962, 1969, 1979, 1989, 1998-1999	Population and Housing Census (Report), Demographic and Health Survey (Report), Demographic Survey (Report), CICRED Monograph
Madagascar	1965, 1975, 1985, 1992-1993, 1997-2003	Population and Housing Census (Report), Demographic and Health Survey (Report)
Malawi	1971-1972, 1977, 1987, 1998, 2008	Population and Housing Census (Report), Demographic Survey (Report)
Malaysia	1957-1961, 1970, 1980, 1991, 2006-2010	CICRED Monograph, Population and Housing Census (Report), Administrative Report
Mali	1960, 1976, 1987, 1996-1998, 2006-2009	Population and Housing Census (Report), Demographic and Health Survey (Report), Demographic Survey (Report)

[Continued on next page]

COUNTRY	YEARS	MAIN SOURCES
		See the excel files "Demographic_Data_X.xls" for the main sources used for each country-year (X = {*Africa*, *Asia*, *Europe*, *LAC*, *MENA*})
Mexico	1965, 1974, 1980, 1990, 2006	UN Statistical Yearbook, Administrative Reports
Myanmar	1965, 1973, 1983, 1999, 2006	CICRED Monograph, Administrative Report
Pakistan	1968, 1971, 1984, 1988, 2007	UN Statistical Yearbook, CICRED Monograph
Panama	1965, 1969, 1985, 1995, 2006	UN Statistical Yearbook
Peru	1960, 1970, 1986, 1990, 2000	Population and Housing Census (Report), Demographic and Health Survey (Report), Demographic Survey (Report), CICRED Monograph
Philippines	1968, 1978, 1988, 1998, 2003	UN Statistical Yearbook, CICRED Monograph
Senegal	1960-1967, 1978, 1986-1988, 1992-1993, 2002	Population and Housing Census (Report), Demographic and Health Survey (Report), Demographic Survey (Report)
South Korea	1966, 1970, 1989, 1989, 2006	UN Statistical Yearbook, Population and Housing Census (Report), CICRED Monograph
Sri Lanka	1961, 1971, 1981-1983, 1987, 2001	Demographic Survey (Report), Demographic and Health Survey (Report), CICRED Monograph, Historical Studies, Administrative Reports
Thailand	1964-1965, 1974-1976, 1985-1986, 1995-1996, 2005-2006	Demographic Survey (Report), CICRED Monograph
Tunisia	1966, 1972, 1980, 1988-1989, 2004-2006	UN Statistical Yearbook, Population and Housing Census (Report), Demographic and Health Survey (Report), CICRED Monograph, Multiple Indicator Cluster Surveys

***Notes*: This table shows the main sources used to reconstruct historical demographic data for each country of Industrial Europe (1700-1910) and today's developing world (1960-2010).** The sources for each country-year observation are described in the excel files "Demographic_Data_X.xls" in the folder of the replication files (X = {*Africa*, *Asia*, *Europe*, *LAC*, *MENA*}).

Administrative Report means that we use a report published by the official administration of that country; ***CICRED Monograph*** means that we use the published report of the 1974 country monograph published by the Committee for International Cooperation in National Research in Demography (http://www.cicred.org/Eng/Publications/content/3MonographNational/Index.html); ***Demographic and Health Survey (Report)*** means that we use the published report of the Demographic and Health Survey conducted by USAID in that country (http://dhsprogram.com/data/available-datasets.cfm); ***Demographic Survey (Report)*** means that we use the published report of a demographic survey that was independently conducted by the country; ***Multiple Indicator Cluster Surveys*** means that we use the published report of the Multiple Indicator Cluster Surveys conducted by UNICEF in that country (http://mics.unicef.org/); ***Population and Housing Census (Report)*** means that we use the published report of the population and housing census; and ***UN Statistical Yearbook*** means that we use the electronic copies of the UN Statistical Yearbooks that are available on the internet (http://unstats.un.org/unsd/demographic/products/dyb/dyb2.htm).

WEB APPENDIX TABLE 2: DECOMPOSITION OF ANNUAL URBAN GROWTH FOR 7 COUNTRIES OF INDUSTRIAL EUROPE, 1800-1910

Country Period:	1800-1850	1850-1870	1870-1910	1800-1910
England				
Urban Growth (%)	2.7	1.8	2.2	2.3
Natural Increase (%)	0.0	0.5	1.1	0.5
Residual Migration (%)	2.7	1.3	1.1	1.9
Belgium				
Urban Growth (%)	1.9	0.3	2.5	1.8
Natural Increase (%)	_	0.4	0.6	0.5
Residual Migration (%)	_	-0.1	1.9	1.3
France				
Urban Growth (%)	1.3	1.0	1.5	1.3
Natural Increase (%)	_	0.2	0.1	0.1
Residual Migration (%)	_	0.7	1.4	1.2
Germany				
Urban Growth (%)	1.8	3.0	3.0	2.5
Natural Increase (%)	0.1	0.2	1.0	0.6
Residual Migration (%)	1.7	2.8	2.0	1.9
Netherlands				
Urban Growth (%)	0.9	0.7	2.1	1.3
Natural Increase (%)	0.0	0.5	1.2	0.4
Residual Migration (%)	0.9	0.2	0.9	0.9
Sweden				
Urban Growth (%)	0.8	2.0	3.2	1.9
Natural Increase (%)	-0.5	0.5	1.0	0.3
Residual Migration (%)	1.3	1.5	2.2	1.6
United States				
Urban Growth (%)	5.2	5.7	3.5	4.6
Natural Increase (%)	0.3	0.4	0.4	0.4
Residual Migration (%)	4.8	5.3	3.1	4.3
Average				
Urban Growth (%)	2.1	2.1	2.6	2.2
Natural Increase (%)	0.0	0.4	0.7	0.5
Residual Migration (%)	2.1	1.7	1.8	1.7

***Notes*: This table shows the decomposition of annual urban growth into annual natural increase and annual residual migration (%) for 7 countries of Industrial Europe in 1800-1910. It shows that migration was the main component of urban growth, and that urban natural increase contributed little to urban growth.** Averages are not weighted by population. See the Web Appendix for data sources.

WEB APPENDIX TABLE 3: DECOMPOSITION OF ANNUAL URBAN GROWTH FOR 35 COUNTRIES OF TODAY'S DEVELOPING WORLD, 1960-2010

Period:		1960-2010			2000-2010		
AREA & *Region*	Country	Urban Growth	Natural Incr.	Residual Migr.	Urban Growth	Natural Incr.	Residual Migr.
ASIA		**3.5**	**1.7**	**1.8**	**2.3**	**1.1**	**1.2**
East Asia (N = 3):		2.9	1.1	1.8	2.0	0.4	1.6
East Asia	China	3.7	1.0	2.7	3.8	0.8	3.0
East Asia	Japan	1.4	0.7	0.7	1.5	0.0	1.5
East Asia	South Korea	3.6	1.5	2.1	0.9	0.5	0.3
South Asia (N = 4):		3.5	1.9	1.6	2.3	1.4	0.9
South Asia	Bangladesh	5.8	2.1	3.7	3.1	1.1	2.0
South Asia	India	3.2	1.8	1.4	2.6	1.3	1.3
South Asia	Pakistan	3.7	2.2	1.5	2.7	1.9	0.8
South Asia	Sri Lanka	1.3	1.5	-0.2	0.6	1.1	-0.5
Southeast Asia (N = 5):		3.9	1.9	2.0	2.5	1.4	1.2
Southeast Asia	Indonesia	4.5	1.8	2.7	2.9	1.6	1.3
Southeast Asia	Malaysia	4.6	2.1	2.5	3.5	1.4	2.1
Southeast Asia	Myanmar	2.7	2.0	0.7	2.3	1.4	0.9
Southeast Asia	Philippines	3.6	2.4	1.2	2.0	2.1	-0.1
Southeast Asia	Thailand	3.0	1.4	1.6	1.7	0.4	1.3
LAC		**3.1**	**2.2**	**0.9**	**2.1**	**1.5**	**0.6**
Central America (N = 4):		3.2	2.5	0.7	2.4	1.7	0.7
Central America	El Salvador	2.7	2.5	0.2	1.3	1.2	0.1
Central America	Guatemala	3.5	2.8	0.7	3.4	2.8	0.6
Central America	Mexico	3.1	2.5	0.6	1.7	1.2	0.5
Central America	Panama	3.5	2.3	1.2	3.0	1.5	1.5
South America (N = 4):		3.1	2.0	1.1	1.9	1.3	0.6
South America	Chile	2.2	1.7	0.5	1.4	1.0	0.4
South America	Colombia	3.2	1.9	1.3	1.9	1.7	0.3
South America	Ecuador	3.8	1.9	1.9	2.7	1.1	1.6
South America	Peru	3.2	2.4	0.8	1.7	1.5	0.2
MENA		**3.6**	**2.6**	**1.0**	**2.1**	**1.6**	**0.5**
Middle-East (N = 2):		4.5	2.8	1.6	2.4	1.8	0.6
Middle-East	Iran	3.9	2.6	1.3	2.0	1.3	0.7
Middle-East	Jordan	5.0	3.0	1.9	2.9	2.4	0.4
Northern Africa (N = 3):		2.7	2.3	0.4	1.7	1.3	0.4
Northern Africa	Algeria	4.2	2.5	2	3.2	1.7	1.5
Northern Africa	Egypt	2.4	2.2	0.2	2.0	1.7	0.3
Northern Africa	Tunisia	3.0	2.4	0.6	1.5	0.9	0.5
AFRICA		**4.9**	**2.9**	**2.1**	**4.1**	**2.4**	**1.7**
Eastern Africa (N = 5):		4.9	2.8	2.1	3.7	2.2	1.4
Eastern Africa	Central Afr. Rep.*	3.5	2.4	1.1	2.1	2.0	0.1
Eastern Africa	Ethiopia	4.6	2.7	1.9	3.8	2.0	1.7
Eastern Africa	Kenya	5.7	2.8	2.9	4.4	2.4	2.0
Eastern Africa	Madagascar	5.1	2.5	2.6	4.7	2.3	2.5
Eastern Africa	Malawi	5.6	3.7	1.9	3.5	2.6	0.9
Western Africa (N = 5):		4.9	2.9	2.0	4.5	2.6	1.9
Western Africa	Burkina-Faso	6.0	3.0	3.0	6.8	3.1	3.7
Western Africa	Ghana	4.2	2.5	1.8	4.0	1.8	2.2
Western Africa	Ivory Coast	5.7	2.7	3.0	3.3	2.4	1.0
Western Africa	Mali	4.5	3.4	1.1	5.2	3.5	1.7
Western Africa	Senegal	4.1	2.8	1.4	3.2	2.5	0.8
All Countries		**3.8**	**2.3**	**1.6**	**2.8**	**1.7**	**1.1**

***Notes*: This table shows the decomposition of annual urban growth into annual natural increase and annual residual migration (%) for 35 countries of today's developing world in 1960-2010.** * The Central African Republic belongs to Central Africa, but data is missing for other countries of the region. We have included it in Eastern Africa. Averages are not weighted by population. See the Web Appendix for data sources.

WEB APPENDIX TABLE 4: URBAN BIRTH RATES, URBAN FERTILITY RATES AND SHARE OF WOMEN OF REPRODUCTIVE AGE IN THE POPULATION, 2000

Dependent Variable:	Urban Birth Rate (%, 2000)	Urban TFR * SWRA (2000)
	(1)	(2)
Urban Total Fertility Rate (TFR)	-0.05	25.92***
(Births per Woman, 2000)	(0.27)	(0.45)
Urban Share Women of Reproductive Age (SWRA)	-0.04	2.81***
(Per 100 People, 2000)	(0.03)	(0.16)
Urban TFR * SWRA	0.03***	
(2000)	(0.01)	
Fixed Effects, Controls	N	N
Observations; R-squared	89; 0.89	89; 0.99

***Notes*: This table shows that the main component of the urban birth rate is the urban total fertility rate (TFR), and not the share of women of reproductive age (SWRA) (15-49 years) in the urban population in 2000. Column (1): The urban birth rate is explained by the product of the two other variables. Column (2): The product is mostly explained by the urban total fertility rate: e.g., a 1 standard deviation in the urban TFR (SWRA) is associated with a 1.12 (0.28) standard deviation in the product.** The sample consists of 89 countries that were still developing countries in 1960, for the closest year to 2000, in the 1990-2010 interval. Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01. In column (1), we regress the urban birth rate (per 100 people) on the urban total fertility rate (the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates), the share of women of reproductive age (15-49 years) in the urban population in 2000, and their product, in 2000. In column (2), we regress the product on the urban total fertility rate and share of women of reproductive age in the urban population. See Web Appendix for data sources and construction of variables.

WEB APPENDIX TABLE 5: ALTERNATIVE IDENTIFICATION STRATEGIES, 1960-2010

Dependent Variable:	Annual Urban Growth Rate (%, Decade t)			Change in the Urbanization Rate (Percentage Points, Decade t)		
	IV-Shares Religions & Family Planning	*IV-Family Planning*	*IV-Shares Religions*	*IV-Shares Religions & Family Planning*	*IV-Family Planning*	*IV-Shares Religions*
	(1)	(2)	(3)	(4)	(5)	(6)
Urban Natural Increase Rate	0.87**	1.13**	0.73**	2.13***	1.82†	2.32***
(Per 100 People, Decade t)	(0.42)	(0.50)	(0.35)	(0.70)	(1.14)	(0.84)
Residual Migration Rate				2.14***	2.11***	2.12***
(Per 100 People, Decade t)				(0.27)	(0.27)	(0.27)
Rural Natural Increase Rate	-0.13	-0.13	-0.02	-1.28***	-1.03*	-1.35***
(Per 100 People, Decade t)	(0.25)	(0.31)	(0.23)	(0.44)	(0.57)	(0.46)
Kleibergen-Paap rk Wald F stat	37.6	10.3	99.9	25.0	8.1	177.8
Country & Decade FE, Controls	Y	Y	Y	Y	Y	Y
Region FE (10) x Time Trend	Y	Y	Y	Y	Y	Y
Observations (35 x 5)	175	175	175	175	175	175
Adj./Centered R-squared	0.84	0.84	0.84	0.80	0.793	0.80

***Notes*: This table shows that the IV results are in line with the OLS results when using as instruments (while simultaneously controlling for rural natural increase in t): Columns (1) and (4): The initial religious conditions and the initial family planning conditions for each country in the 1960s, interacted with decade FE (to allow them to have an effect on the country-specific evolutions of urban fertility, and thus urban natural increase). Columns (2) and (5): The initial family planning conditions in the 1960s, interacted with decade FE. Columns (3) and (6): The initial religious conditions in the 1960s, interacted with decade FE.** The sample is the same as in Table 1. Robust SEs clustered at the country level in parentheses; † p<0.11 * p<0.10, ** p<0.05, *** p<0.01. The initial religious conditions are the population shares of 8 religions = [Catholicism, Protestantism, Other Christian Religions, Islam, Hinduism, Buddhism, Other Eastern Religions, Other Religions] in the 1960s. The initial family planning conditions are 4 dummies equal to one if the country had very weak, weak, moderate or strong family planning policies in the 1960s, interacted with decade FE. All regressions include country and decade FE, log GDP per capita (PPP, cst 2005$) at the start and the end of the decade, and the same controls as in Table 1. In columns (1)-(3), we add the urbanization rate at the start of the decade. See Web Appendix for data sources.

WEB APPENDIX TABLE 6: URBAN BIRTH RATES, POPULATION SHARES OF MAJOR RELIGIONS AND FAMILY PLANNING EFFORT IN THE 1960s

Dependent Variable:	Urban Birth Rate (%, 1960s)	
	(1)	(2)
Catholicism (% of Population, 1960s)	2.71**	
	(1.28)	
Islam (% of Population, 1960s)	2.56**	
	(1.17)	
Protestantism (% of Population, 1960s)	4.15	
	(2.51)	
Other Christian Religions (% of Population, 1960s)	2.38	
	(1.54)	
Hinduism (% of Population, 1960s)	1.11	
	(1.33)	
Buddhism (% of Population, 1960s)	1.06	
	(1.21)	
Other Eastern Religions (% of Population, 1960s)	0.59	
	(2.08)	
Other Religions (% of Population, 1960s)	3.15**	
	(1.36)	
Strong Family Planning Effort (1960s)		-1.71***
		(0.50)
Moderate Family Planning Effort (1960s)		-1.22***
		(0.30)
Weak Family Planning Effort (1960s)		-0.79***
		(0.28)
Log GDP Per Capita	-0.46**	-0.07
(constant 2005 international $, 1960)	(0.21)	(0.15)
Fixed Effects, Controls	N	N
Observations; R-squared	35; 0.62	35; 0.48

***Notes*: This table shows the strong correlations between the initial urban birth rate (1960s) and the initial cultural/religious and policy environments (proxied by measures in the 1960s), conditional on income per capita (1960). Column (1): Catholic and Muslim countries started with higher urban birth rates. No significant difference is found for other religions. Column (2): The countries that have "idiosyncratically" adopted family planning policies in the 1960s had lower urban births rates then. In Web Appendix Table 5, we interact these initial conditions with year FE to allow them to have an effect on the country-specific evolutions of urban fertility.** The sample consists of 35 countries that were still developing countries in 1960. Robust SEs in parentheses; * p<0.10, ** p<0.05, *** p<0.01. Column (1): The population share of the irreligious residents (%) is the omitted variable. Column (2): Ross and Maudlin (1996) use their Family Planning Effort (FPE) index to define 4 categories of family planing policies in the 1960s: *very weak* (0 < FPE ≤ 20), *weak* (20 < FPE ≤ 45), *moderate* (45 < FPE ≤ 66) and *strong* (66 < FPE ≤ 100). The countries with *very weak* family planning are the omitted group. See Web Appendix for data sources.

WEB APPENDIX TABLE 7: FAMILY PLANNING, RELIGION AND URBAN GROWTH, 1950s-60s

Dependent Variable:	Dummy for Moderate or Strong Family Planning Effort (1960s)		Population Share (%) of Catholics and Muslims (1960s)	
	(1)	(2)	(3)	(4)
Annual Urban Growth Rate	-0.06	0.01	0.01	0.01
(%, 1950s)	(0.05)	(0.07)	(0.03)	(0.06)
Annual Urban Growth Rate		-0.10		0.00
(%, 1960s)		(0.09)		(0.06)
Log GDP Per Capita	0.13	0.12	0.22***	0.22***
(cst. 2005 international $, 1960)	(0.09)	(0.09)	(0.07)	(0.07)
Fixed Effects, Controls	N	N	N	N
Observations; R-squared	35; 0.08	35; 0.13	35; 0.27	35; 0.27

***Notes*: This table shows that the probability of adopting a strong or moderate family planning policy in the 1960s and the total population share (%) of catholicism and islam in the 1960s are independent of the urban growth rate in the 1950s (and the 1960s) conditional on per capita income in 1960.** The sample consists of 35 countries that were still developing countries in 1960. Robust SEs in parentheses; * p<0.10, ** p<0.05, *** p<0.01. See Web Appendix for data sources.

WEB APPENDIX TABLE 8: AUTOREGRESSIVE DISTRIBUTED LAG (ADL) MODEL (SECOND LAGS ONLY), 1960-2010

Dependent Variable:	Annual Urban Growth Rate (%, Decade t)	Change in the Urbanization Rate (Percentage Points, Decade t)
	(1)	(2)
Urban Natural Increase Rate (Per 100 People, Decade t)	0.92***	2.47**
	(0.41)	(1.10)
Residual Migration Rate (Per 100 People, Decade t)		3.06***
		(0.57)
Rural Natural Increase Rate (Per 100 People, Decade t)	0.12	-1.81**
	(0.30)	(0.88)
Urban Natural Increase Rate (Per 100 People, Decade t-2)	0.63	-0.89
	(0.40)	(0.91)
Residual Migration Rate (Per 100 People, Decade t-2)		1.20**
		(0.54)
Rural Natural Increase Rate (Per 100 People, Decade t-2)	0.04	0.93
	(0.30)	(0.80)
Annual Urban Growth Rate (Per 100 People, Decade t-2)	-0.28**	
	(0.12)	
Change in Urbanization Rate (Percentage Points, Decade t-2)		-0.30
		(0.20)
Estimated Long-Term Effect of Urban Natural Increase Rate	1.21**	1.21
	(0.57)	(1.12)
AIC; BIC	146.4; 212.7	332.6; 404.2
Country & Decade FE, Controls	Y	Y
Region FE (10) x Time Trend	Y	Y
Observations (35 x 3); Adj. R2	105; 0.84	175; 0.83

***Notes*: This table shows the coefficients of each variable of interest and its second lag, as well as the coefficient of the second lag of the dependent variable, when using the ADL(2,2) model. It also shows the estimated long-term effect of urban natural increase, which is a non-linear combination of some of the coefficients.** The sample is the same as in Tables 1 and 2. Robust SEs clustered at the country level in parentheses; † p<0.11 * p<0.10, ** p<0.05, *** p<0.01. All regressions include country and decade FE, log GDP per capita (PPP, cst 2005$) at the start and the end of the decade, and the same controls as in Table 1 (see the main text). In column (1), we add the urbanization rate at the start of the decade. See Web Appendix for data sources.

WEB APPENDIX TABLE 9: URBAN BIRTH RATES AND GROWTH RATE OF THE LARGEST CITY, MULTIVARIATE CROSS-SECTIONAL ANALYSIS, 1960-2010

Dependent Variable:	Annual Urban Growth Rate of the Largest City (%, 1960-2010)
	(1)
Largest City's Birth Rate (Per 100 People, 1960-2010)	1.17***
	(0.34)
F-test [p-value]: Largest City's Birth Rate - 1 = 0	0.26
	[0.61]
Controls, Region FE (13)	Y
Observations; R-squared	94; 0.72

***Notes*: This table shows that the largest city's birth rate has an effect of about 1 on the growth of that city (we use the birth rate in 2000 as a proxy for the urban birth rate in 1960-2010). We cannot control for the city death rate as we do not have data.** The sample consists of 94 countries that were still developing countries in 1960. Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01. The controls are listed in the main text. The dependent variable is the annual growth rate (%) of the largest city between 1960 and 2010. The F-test tests if the coefficient of the variable of interest is different from 1 (in absolute value). See Web Appendix for data sources.

WEB APPENDIX TABLE 10: NATURAL INCREASE AND URBAN PRIMACY, 1960-2010

Dependent Variable:	Change in the Primacy Rate (Pct. Points, Decade t)	
	(1)	(2)
Urban Natural Increase Rate	-0.42	-0.35
(Per 100 People, Decade t)	(0.80)	(0.84)
Country & Decade FE, Controls, Region FE (10) x Time Trend	Y	Y
Primacy Rate (%) 1960 x Decade FE	N	Y
Observations; Adj. R-squared	175; 0.59	175; 0.60

***Notes*: This table shows that urban natural increase has no effect on the urban primacy rate, the share of the largest city in the urban population, when estimating the panel model for 35 developing countries in 1960-2010.** The sample consists of 35 countries that were still developing countries in 1960, for the following decades: 1960, 1970, 1980, 1990 and 2000. Robust SEs clustered at the country level; * p<0.10, ** p<0.05, *** p<0.01. The specification is the same as in row 2 of Table 1. The controls are listed in the main text. Column (2): The results are robust to controlling for the initial urban primacy rate (%) in 1960 interacted with decade FE. See Web Appendix for data sources.

WEB APPENDIX TABLE 11: NATURAL INCREASE AND URBANIZATION, 1960-2010

Dependent Variable:	Change in the Urbanization Rate (Pct. Points, Decade t)
	(1)
Residual Migration Rate	1.58***
(Per 100 People, Decade t)	(0.58)
Urban Natural Increase Rate	2.14***
(Per 100 People, Decade t)	(0.30)
Country & Decade FE; Controls; Region FE x t; Rni_t	Y
Urbanization Rate (%) 1960 x Decade FE	Y
Observations; Adj. R-squared	175; 0.71

***Notes*: This table shows that the effects are robust to controlling for the initial urbanization rate in 1960 interacted with decade fixed effects.** The sample consists of 35 countries that were still developing countries in 1960, for the following decades: 1960, 1970, 1980, 1990 and 2000. Robust SEs clustered at the country level; * p<0.10, ** p<0.05, *** p<0.01. The specification is the same as in row 2 of Table 3. The controls are listed in the main text. See Web Appendix for data sources.

WEB APPENDIX TABLE 12: URBAN NATURAL INCREASE AND SLUMS, 1960-2010

Dependent Variable:	Urban Population Living in Slums (%, 2005-2010)		
	(1)	(2)-*OLS*	(3)-*IV*
Change in Urbanization Rate	0.58	0.36	0.03
(Pct. Points, 1960-2010)	(0.97)	(1.25)	(1.13)
No. Years for Urban Pop. x2	-0.60***		
(Average, 1960-2010)	(0.18)		
No. Years for Urban Pop. x2	-0.66**		
* Dummy (No. Years < Sample Mean)	(0.31)		
Urban Natural Increase		14.51***	21.60***
(%, (4)-(5): 1960-2010)		(5.16)	(6.91)
Residual Migration		4.60*	5.28**
(%, (4)-(5): 1960-2010)		(2.66)	(2.25)
Controls, Region FE (10	Y	Y	Y
Observations; Adj. R-squared	95; 0.80	94; 0.80	95;0.79

***Notes*: This table shows that: (1) the slum share increases convexely with the speed of urban growth, and (2)-(3) urban natural increase in 1960-2010 still has an effect on the slum share when using as instruments for urban natural increase the initial religious and family planning conditions in the 1960s.** The sample consists of 95 countries that were still developing countries in 1960. Robust SEs; * p<0.10, ** p<0.05, *** p<0.01. Urban natural increase in 2000 is used as a proxy for urban natural increase in 1960-2010. The migration rate in 1960-2010 is the residual between the annual urban growth rate and the urban natural increase rate in 2000. All regressions include log GDP per capita (PPP, cst 2005$) and the urbanization rate (%) in 1960 and 2010, region FE, and the controls. Column (1): The number of years in which the population doubles is estimated using the urban growth rate. We create a dummy equal to one if this number is below the mean (19.4). Column (3): We instrument urban natural increase with the initial religious and family planning conditions in the 1960s (IV F-statistic: 5.4). See Web Appendix for data sources.

WEB APPENDIX TABLE 13: URBAN NATURAL INCREASE, RURAL GROWTH AND URBAN CONGESTION, 1960-2010

Dependent Variable (Urban, 2000-2010):	Lack Liv. Area (%) (1)	Finished Floor (%) (2)	Water Source (%) (3)	Sanitation Facilities (%) (4)
Urban Natural Increase	8.9*	-8.4	-3.2	-1.4
(%, 1960-2010)	(4.4)	(5.9)	(2.0)	(3.2)
Residual Migration	3.2	-3.0	-1.9	-2.0
(%, 1960-2010)	(2.5)	(3.7)	(1.2)	(1.9)
Annual Rural Growth Rate	-0.1	-0.2	-0.8	1.0
(%, 1960-2010)	(0.2)	(4.4)	(1.8)	(2.7)
Observations; Sample Mean	57; 18.8	66; 77.9	92; 88.5	92; 65.1
Dependent Variable (Urban, 2000-2010):	Solid Fuels (%) (5)	School Attend. (6-15 y.o., %) (6)	Urban PM10 (mg per m^3) (7)	Empl. Share Pers. Serv. (%) (8)
Urban Natural Increase	19.5**	-11.0***	14.3	4.1**
(%, 1960-2010)	(8.4)	(4.0)	(11.1)	(1.9)
Residual Migration	5.7	-2.4	-2.0	1.0
(%, 1960-2010)	(6.0)	(2.8)	(6.2)	(1.0)
Annual Rural Growth Rate	-8.1	0.3	6.1	0.1
(%, 1960-2010)	(5.2)	(2.9)	(9.5)	(0.1)
Observations; Sample Mean	78; 71.1	65; 79.8	93; 71.3	72; 5.5
Specification Col.(1) Table 4	Y	Y	Y	Y

***Notes*: This table confirms that fast urban natural increase in 1960-2010 is associated with higher urban congestion in 2000-2010, even when we control for the speed of rural growth in 1960-2010. The speed of rural growth has no effect on urban congestion.** The sample consists of 93 countries that were still developing countries in 1960. Robust SEs in parentheses; * p<0.10, ** p<0.05, *** p<0.01. Urban natural increase in 2000 is used as a proxy for urban natural increase in 1960-2010. The migration rate in 1960-2010 is the residual between the annual urban growth rate and the urban natural increase rate in 1960-2010. We also control for the annual rural growth rate in 1960-2010. Column (1): The dependent variable is the share of urban inh. who lack sufficient-living area (%) in 2005. Column (2): It is the share of urban inh. who live in a residence with a finished floor (%) in 2005. Columns (3)-(4): It is the share of urban inh. who have access to an improved water source and improved sanitation facilities in 2005 respectively (%). Column (5): It is the share of urban inh. using solid fuels (%) in 2000-2010. Column (6): It is the urban share of 6-15 year-old children that attend school (%) in 2000-2010. Column (7): It is a measure of particulate matter (PM) concentrations in residential areas of cities ≥ 100,000 inh in 2010. Column (8): It is the urban employment share of personal and other services (%) in 2000-2010. All regressions include log GDP per capita (PPP, cst 2005$) and the urbanization rate (%) in 1960 and 2010, region FE, and the same controls as in Table 4 (see the notes below the Table). See Web Appendix for data sources.

WEB APPENDIX TABLE 14: URBAN NATURAL INCREASE, RURAL GROWTH AND URBAN DEPENDENCY RATIOS, 1960-2010

Dependent Variable (Urban, 2000-2010):	Child Dependency (0-14 y.o.) Ratio (1)	Aged Dependency (65-+ y.o.) Ratio (2)	Total Dependency (0-14 & 65-+ y.o.) Ratio (3)
Urban Natural Increase	9.7***	-2.8***	6.9**
(%, 1960-2010)	(2.8)	(0.6)	(2.8)
Residual Migration	0.5	-1.18***	-0.6
(%, 1960-2010)	(1.2)	(0.28)	(1.2)
Annual Rural Growth Rate	-0.2*	0.01	-0.2
(%, 1960-2010)	(0.1)	(0.1)	(0.1)
Observations; Sample Mean	88; 57.2	88; 7.2	88; 64.4
Specification Col.(1) Table 4	Y	Y	Y

***Notes*: This table confirms that fast urban natural increase in 1960-2010 is associated with higher urban dependency ratios in 2000-2010, even when we control for the speed of rural growth in 1960-2010. The speed of rural growth has no, or little, effect on the urban dependency ratios.** The sample consists of 89 countries that were still developing countries in 1960. Robust SEs in parentheses; * p<0.10, ** p<0.05, *** p<0.01. Urban natural increase in 2000 is used as a proxy for urban natural increase in 1960-2010. The migration rate in 1960-2010 is the residual between the annual urban growth rate and the urban natural increase rate in 1960-2010. We also control for the annual rural growth rate in 1960-2010. Column (1): The dependent variable is the ratio of the number of urban inh. aged 0-14 over the number of urban inh. aged 15-64. Column (2): It is the ratio of the number of urban inh. aged 0-14 or 65-120 over the number of urban inh. aged 15-64. Column (3): It is the ratio of the number of urban inh. aged 0-14 or 65-120 over the number of urban inh. aged 15-64. All regressions include log GDP per capita (PPP, cst 2005$) and the urbanization rate (%) in 1960 and 2010, region FE, and the same controls as in Table 4 (see the notes below the Table). See Web Appendix for data sources.

WEB APPENDIX TABLE 15: RURAL NATURAL INCREASE, URBAN GROWTH AND RURAL CONGESTION, 1960-2010

Dependent Variable (Rural, 2000-2010):	Living Area (%) (1)	Finished Floor (%) (2)	Water Source (%) (3)	Sanitation Facilities (%) (4)
Rural Natural Increase	_	-11.1*	-7.3*	-11.3**
(%, 1960-2010)	_	(6.4)	(3.7)	(4.3)
Residual Rural Outmigration	_	-6.3	-4.4	-6.0
(%, 1960-2010)	_	(5.9)	(3.0)	(3.6)
Annual Urban Growth Rate	_	-4.4	0.9	0.2
(%, 1960-2010)	_	(4.0)	(2.2)	(2.3)
Observations	_	66; 37.4	92; 65.5	92; 42.2
Dependent Variable (Rural, 2000-2010):	Solid Fuels (%) (5)	School Attend. (6-15 y.o., %) (6)	PM10 (mg per m^3) (7)	Empl. Share Pers. Serv. (%) (8)
Rural Natural Increase	15.5***	-11.2**	_	_
(%, 1960-2010)	(3.9)	(5.0)	_	_
Residual Rural Outmigration	10.8**	-4.2	_	_
(%, 1960-2010)	(4.4)	(4.7)	_	_
Annual Urban Growth Rate	-2.4	1.4	_	_
(%, 1960-2010)	(2.9)	(3.9)	_	_
Observations; Sample Mean	78; 71.1	65; 66.2	_	_
Specification Col.(1) Table 4	Y	Y	Y	Y

***Notes*: This table shows that fast rural natural increase in 1960-2010 is associated with higher rural congestion in 2000-2010. The speed of urban growth in 1960-2010 has no effect on rural congestion today.** The sample consists of 92 countries that were still developing countries in 1960. Robust SEs in parentheses; * p<0.10, ** p<0.05, *** p<0.01. Rural natural increase in 2000 is used as a proxy for rural natural increase in 1960-2010. The rural outmigration rate in 1960-2010 is the residual between the rural natural increase rate and the annual rural growth rate in 1960-2010. We also control for the annual urban growth rate in 1960-2010. Column (1): No data exists on the share of rural inh. who lack sufficient-living area (%) today. Column (2): The dependent variable is the share of rural inh. who live in a residence with a finished floor (%) in 2005. Columns (3)-(4): It is the share of rural inh. who have access to an improved water source and improved sanitation facilities in 2005 respectively (%). Column (5): It is the share of rural inh. using solid fuels (%) in 2000-2010. Column (6): It is the rural share of 6-15 year-old children that attend school (%) in 2000-2010. Column (7): No data exists on particulate matter (PM) concentrations in rural areas today. Column (8): We cannot use the "personal and other services" sector as a rural refugee sector. All regressions include log GDP per capita (PPP, cst 2005$) and the urbanization rate (%) in 1960 and 2010, region FE, and the same controls as in Table 4 (see the notes below the Table). See Web Appendix for data sources.

WEB APPENDIX TABLE 16: RURAL NATURAL INCREASE, URBAN GROWTH AND RURAL DEPENDENCY RATIOS, 1960-2010

Dependent Variable (Rural, 2000-2010):	Child Dependency (0-14 y.o.) Ratio (1)	Aged Dependency (65-+ y.o.) Ratio (2)	Total Dependency (0-14 & 65-+ y.o.) Ratio (3)
Rural Natural Increase	14.6***	-1.3	13.4***
(%, 1960-2010)	(3.8)	(0.8)	(4.0)
Residual Rural Outmigration	6.2*	-0.8	5.4
(%, 1960-2010)	(3.1)	(0.8)	(3.3)
Annual Urban Growth Rate	-0.3	-1.2**	-1.5
(%, 1960-2010)	(2.1)	(0.6)	(2.3)
Observations; Sample Mean	70; 88.2	70; 9.8	70; 98.0
Specification Col.(1) Table 4	Y	Y	Y

***Notes*: This table shows that fast rural natural increase in 1960-2010 is associated with higher rural dependency ratios in 2000-2010. The speed of urban growth in 1960-2010 has no, or little, effect on the rural dependency ratios today.** The sample consists of 70 countries that were still developing countries in 1960. Robust SEs in parentheses; * p<0.10, ** p<0.05, *** p<0.01. Rural natural increase in 2000 is used as a proxy for rural natural increase in 1960-2010. The residual rural outmigration rate in 1960-2010 is the residual between the rural natural increase rate and the annual rural growth rate in 1960-2010. We also control for the annual urban growth rate in 1960-2010. Column (1): The dependent variable is the ratio of the number of rural inh. aged 0-14 over the number of rural inh. aged 15-64. Column (2): It is the ratio of the number of rural inh. aged 0-14 or 65-120 over the number of rural inh. aged 15-64. Column (3): It is the ratio of the number of rural inh. aged 0-14 or 65-120 over the number of rural inh. aged 15-64. All regressions include log GDP per capita (PPP, cst 2005$) and the urbanization rate (%) in 1960 and 2010, region FE, and the same controls as in Table 4 (see the notes below the Table). See Web Appendix for data sources.