WEB APPENDIX: NOT FOR PUBLICATION

A Dependency, Labor Supply, Productivity & Earnings

Direct Effects. The World Bank (2018) is a database consisting of about 1,500 individual-level household or labor force surveys. We use these surveys to examine the possible direct effects and indirect intra-household or city-wide effects of the presence of children and seniors on labor supply, productivity and earnings. We only use about half of the 1,500 samples because we restrict the analysis to samples between 1990 and 2016 and for which the number of hours worked and the monthly wage are available. Unfortunately, since many surveys do not allow us to identify specific cities and/or may not be representative at the city level, and since there are many countries for which we do not have a survey both circa 1996 and circa 2011, we cannot use the same long-difference specification as before. Instead, we examine the short-term effects of the CDRs and ADRs in urban areas, assuming that they have long-term effects as a result.

We first study the direct effects of children and seniors on their own earnings. More precisely, for all "urban" individuals in the surveys, we regress a dummy equal to one if the individual works on dummies equal to one if the individual is aged 14 or lower or if the individual is aged 65 or above (in order to match our definitions of the child and aged dependency ratios). In column (1) of Panel A in Web Appx. Table A7, we include country-year sample fixed effects and the following Mincerian controls: a male dummy, a married dummy and its interaction with the male dummy, and the number of years of education and its square. In column (2), we also add, for a smaller sample of country-years for which information is available, fixed effects corresponding to third-level administrative units (if not available, we use second-level units). This corresponds to counties in the U.S. Doing so, we limit the comparison to individuals in the same "urban area". Finally, standard errors are clustered at the household level.

The direct effects are -0.32*** (col. 1)/-0.37*** (col. 2) for children and -0.37***/-0.42*** for seniors. Note that the numbers of samples and countries used are indicated in separate rows in the table. In columns (3)-(4), (5)-(6) and (7)-(8), we use the same two specifications and study for those who work the effects of being below 14 or above 65 on the log number of hours worked, the log hourly wage – i.e., labor productivity –, and the log monthly wage.[1] As expected, children work far fewer hours, for a much lower wage, thus generating much lower earnings than working-age adults. The productivity and earnings effects are milder, but still strong and significant, for seniors. Overall, children (seniors) work 32-37% (37-42%) less than working-age

[1] Since we use logs and sample fixed effects, we do not need to convert wages to a single currency.

adults, and when they work, they generate an income that is 80-82% (36-38%) lower. Thus, on average, children (seniors) bring 87-88% (60-64%) less income than working-age adults.[2] These effects are substantial. In our sample of 351 agglomerations, going from the 10th to the 90th percentile in the CDR (ADR) increases the share of children (seniors) in the city from about 18% to 40% (3% to 14%). If each child (senior) brings 87-88% (60-64%) less income than a working-age adult, city total income decreases by 19% (7%).

Intra-household effects. To explore such effects, we examine if high household-level CDRs and ADRs affect earnings for (15-64 year-old) working-age adults, again using the same two specifications. Since we drop children and seniors to focus on working-age adults, controls now include age and age squared.[3] As seen in col. (1)-(2) of Panel B, the likelihood of working decreases with the CDR and the ADR. Next, for workers, the number of hours worked decreases (col. (3)-(4)), while the hourly wage either decreases or increases (col. (5)-(6)) when children are present depending on whether we add "district" (i.e. admin-3 level) fixed effects. However, on net, monthly earnings decrease (col. (7)-(8)) irrespective of specification. When seniors are present, we find no effect on hours (col. (3)-(4)) but a negative effect on the hourly wage (col. (5)-(6)) and earnings (col. (7)-(8)). Overall, each point of CDR decreases labor force participation by 2-4% but also reduces monthly earnings for workers by 2-9%, thus reducing total earnings by 6-11%. Each point of ADR, meanwhile, reduces the probability of working by 3-5% and monthly earnings for workers by 6-7%, thus reducing total earnings by 9-12%. These effects are meaningful. In our sample of 351 cities, going from the 10th to the 90th percentile in the CDR and the ADR raises the mean household CDR and ADR by about 0.5 and 0.16 respectively. This implies that total earnings are reduced by 3-5% and 1-2%, respectively.

City-wide effects. We study city-wide indirect effects by adding to the previous regressions the mean CDR and ADR for the entire urban area in which an individual is located. In columns (1), (3), (5) and (7) of Panel C, we use the mean urban CDR and ADR for the "district" of the individual. In columns (2), (4), (6) and (8), we use the mean CDR and ADR for the primary sampling unit (PSU) of the individual, which we interpret as being the "neighborhood" where she lives. We cluster standard errors at the district level. Comparing Panels B and C, we see that the indirect intra-household effects are not dramatically altered by including the city-wide effects. Total earnings are now reduced by 1-3% and 1-2% for children and seniors, respectively (see footnote 32 for the formula used). Panel C then shows negative city-wide effects on labor participation (col. (1)-(2)) and earnings for those who work (col. (7)-(8)) when the city CDRs and ADRs are defined at the district level. If we use measures based on PSUs, we lose observations,

[2] For children, the formulas are 0.32*(-100) + 0.68*(-82) = -88% and 0.37*(-100) + 0.63*(-80) = -87%.

[3] Since city CDRs and ADRs are the household size-weighted mean CDRs and ADRs of all households in the city, we use as weights the sample weights multiplied by the individual's household size.

because the PSU is not available for all surveys, and some effects lose significance. If we focus on point estimates only, total earnings are reduced by 21-58% (45-67%) for each point of the CDR (ADR). Going from the 10th to the 90th percentiles in the mean household CDRs (ADRs) then reduces total city income by 10-29% (7-11%).

Overall, going from the 10th to the 90th percentiles in the CDRs and the ADRs reduces total city income by 19% + 1-3% + 10-29% = 30-51% and 7% + 1-2% + 7-11% = 15-20%, respectively. If we believe the district-level effects, the direct and intra-household effects altogether account for 45% of the total effects. If we believe the more conservative PSU-level effects, the direct and intra-household effects account for 55-65% of total effects. City-wide effects are potentially large.[4]

Rural vs. Urban Areas. If we study the direct and indirect intra-household effects in rural areas, we find significantly less negative effects (see Web Appx. Table A8 which is structured like Web Appx. Table A7). In other words, children and seniors do not reduce rural labor supply and earnings as much as in urban areas, plausibly because urban sectors particularly rely on full-time prime-age workers, a possibility we explore below.

More precisely, the labor force participation effects of columns (1)-(2) are much less negative for rural areas than for urban areas. For those who work (Col. (7)-(8)), the direct effect of being a child on earnings and the indirect intra-household effect of seniors on the earnings of working-age adults are less negative in rural areas. We do not investigate spillovers since rural populations are not spatially concentrated.

Time Use. Children and seniors reduce labor supply and productivity. Probing deeper, the question arises of how the presence of children and/or seniors affects the time allocation decisions of working age adults at a more detailed level. To answer this question we turn to time use surveys for the United States, which are available annually for 2003-2015 (Hofferth et al., 2018).[5] For these samples, we restrict our analysis to "urban" residents and study how household- and city-level CDRs and ADRs affect the number of minutes spent: (i) taking care of relatives ("care time"); (ii) working or investing in education or job training ("work time"); (iii) sleeping (the lack of which may have detrimental effects on productivity);[6] and (iv) enjoying leisure time and other activities. In addition to year-month of interview and day of the week

[4] If we distinguish 0-9 and 10-14 year-olds and also distinguish 65-74 and 75+ year-olds, we find that younger children (0-9) and older seniors (75+) work and earn significantly less, as well as the working-age adults in their household and their city (not shown, but available upon request).

[5] Ideally, we would have examined time use data for a variety of countries. Unfortunately, however, reliable time use data is difficult to come by, especially for developing countries.

[6] Fatigue has effects on health (Kochanek et al., 2014-12), safety in the workplace (Gold et al., 1992; Lemke et al., 2016) and productivity and cognitive performance (Nuckols et al., 2009). According to Hafner et al. (2017), compared to a worker sleeping between seven and nine hours a day, workers sleeping less than six hours on average lose six working days a year, while those sleeping 6-7 hours lose 3.7 days.

fixed effects, we add the following Mincerian controls: a male dummy, a married dummy, their interaction, the number of years of education and its square, and age and its square. We use as weights the sample weights multiplied by the size of the individual's household. Standard errors are clustered at the household level. Web Appx. Table A9 shows the results. In col. (2), (4), (6) and (8), we add city fixed effects to compare individuals in the same city. Note that, in this case, the city is the metropolitan statistical area (MSA) in which the individual lives. If this is not identifiable, it is the county.

In Panel A, we only include the household-level CDR and ADR measures. As can be seen, the household CDR increases care time mostly at the expense of work and leisure time, with the effect on sleeping time, although significant, only being small. An increase in the household ADR, meanwhile, increases leisure time (including the time used for other activities) at the expense of work time. These effects are meaningful. For a household of two working-age adults, one more 0-14 year-old child raises the CDR by 0.5, causing reductions of work, leisure and sleep time of 18 minutes, 13 minutes and 3 minutes per day per working-age adult, respectively. Assuming 22 work days per month, this corresponds to 14, 10 and 2 hours per month per household. By contrast, one more senior in a household reduces work time by 9 mins per day per working-age adult (i.e., 7 hours per month per household), whereas care time, somewhat surprisingly, decreases and leisure time increases. However, it could be that leisure time includes spending quality time with ageing parents, another form of "care time".[7]

Next, we find that the direct effects of children are mostly driven by 0-9 year-olds (not shown, but available upon request). Meanwhile, the effects of seniors are driven by 65-74 year-olds. Seniors aged 75 or more do not have measurable effects, possibly because there are private or public facilities targeted at providing care for them.[8]

In Panel B, we add city-level CDR and ADR measures, whether measured at the MSA-county level (col. (1), (3), (5) and (7)) or at the county level (col. (2), (4), (6) and (8)). County-level measures may better capture the effects of children/seniors external to the household. Also note that we add state fixed effects and cluster standard errors at the MSA-county level. Comparing Panels A and B, the intra-household effects are unchanged when adding city-level measures. The city CDR is then associated with more care time and less sleep, but the latter effect is only significant at 15% when the city CDR is defined at the MSA-county level. If all households get one extra child, the city CDR increases by 0.5, and the sleep time cost per working-age adult is 21 mins

[7] The effects on work and education/job training are almost driven in their entirety by "work" (not shown, but available upon request). Note that work includes commutes to the workplace. The effects on leisure and other activities are driven by "socializing, relaxing and leisure" (not shown).

[8] Each extra 0-9 year-old child reduces daily work, leisure and sleep time 22, 20, and 4 minutes per day per working-age adult, respectively (not shown, but available upon request). 10-14 year-old children have an effect on work time that is half as large and no effect on sleep or leisure (not shown).

a day and 16 hours per month per household. It could be that parents wake up earlier to drive their children to school. Likewise, more seniors in the county are associated with more care time, possibly at the expense of work. This latter effect is not significant, although the point estimate is high. Indeed, if seniors have their own housing unit, the city CDR may capture the effect of taking care of one's parents rather than city-wide effects. No matter the source of the area-wide ADR effect, if all households get one extra senior, the care time cost per working-age adult is 20 mins a day and 14 hours per month per household.

Summary. The evidence points to the following facts: (i) Direct effects of age structure on earnings are large, mostly because children and seniors do not work, or when they do, they work fewer hours for a lower wage; (ii) Indirect effects are large too, especially at the city level; (iii) These effects affect cities as a whole rather than specific areas; (iv) The effects appear more important for younger children and older seniors and for some sectors; and (v) Similar effects are not observed for rural observations.

REFERENCES

Barro, Robert J. and Rachel M. McCleary, "Religion and Economic Growth across Countries," *American Sociological Review*, 2003, *68* (5), 760–781.

Bosker, Maarten, Jane Park, and Mark Roberts, "Definition matters. Metropolitan areas and agglomeration economies in a large-developing country," *Journal of Urban Economics*, 2020, p. 103275.

CIESIN, *Global Rural-Urban Mapping Project. Verion 1 (GRUMPv1): Urban Extent Polygons, Revision 01. Center for International Earth Science Information Network* 2017.

European Commission, *GHSL-OECD Functional Urban Areas: Public Release of GHS-FUA* 2019.

Ferreyra, Maria Marta and Mark Roberts, *Raising the Bar for Productive Cities in Latin America and the Caribbean* 2018.

Florczyk, Aneta, Christina Corbane, Marcello Schiavina, Martino Pesaresi, Luca Maffenini, Michele Melchiorri, Panagiotis Politis, Filip Sabo, Sergio Freire, Daniele Ehrlich, Thomas Kemper, Pierpaolo Tommasi, Donato Airaghi, and Luigi Zanchetta, *GHS Urban Centre Database 2015, multitemporal and multidimensional attributes, R2019A* 2019.

Gold, Diane R, Suzanne Rogacz, Naomi Bock, Tor D Tosteson, Timothy M Baum, Frank E Speizer, and Charles A Czeisler, "Rotating shift work, sleep, and accidents related to sleepiness in hospital nurses.," *American journal of public health*, 1992, *82* (7), 1011–1014.

Hafner, Marco, Martin Stepanek, Jirka Taylor, Wendy M Troxel, and Christian van Stolk, "Why sleep matters—the economic costs of insufficient sleep: a cross-country comparative analysis," *Rand health quarterly*, 2017, *6* (4).

Hofferth, Sandra L., Sarah M. Flood, and Matthew Sobek, *American Time Use Survey Data Extract Builder: Version 2.7 [dataset]* 2018.

Kochanek, Kenneth D, Sherry L Murphy, Jiaquan Xu, and Elizabeth Arias, "Mortality in the United States, 2013," *NCHS data brief*, 2014-12, (178), 1–8.

Lemke, Michael K, Yorghos Apostolopoulos, Adam Hege, Sevil Sönmez, and Laurie Wideman, "Understanding the role of sleep quality and sleep duration in commercial driving safety," *Accident Analysis & Prevention*, 2016, *97*, 79–86.

Maddison, Angus, *Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD* 2008.

Nuckols, Teryl K., Jay Bhattacharya, Dianne Miller Wolman, Cheryl Ulmer, and José J. Escarce, "Cost Implications of Reduced Work Hours and Workloads for Resident Physicians," *New England Journal of Medicine*, 2009, *360* (21), 2202–2215.

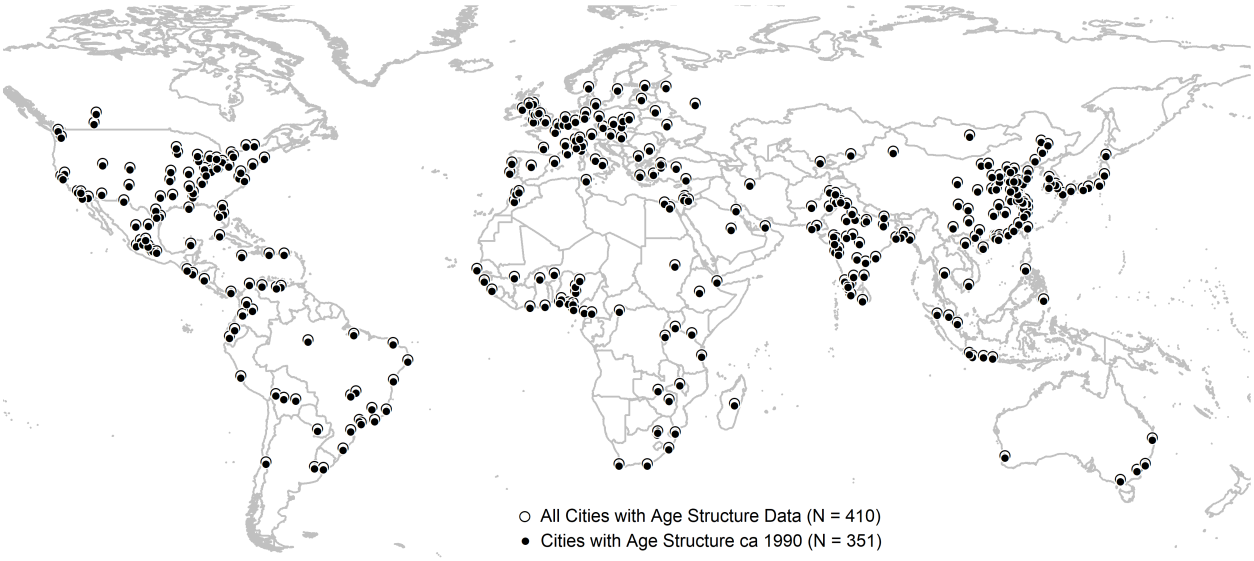
The World Bank, *International Income Distribution Database*, Washington DC: The World Bank, 2018.

World Bank, *The Global Family Planning Revolution: Three Decades of Population Policies and Programs* 2007.

__ , *World Development Indicators* 2017.

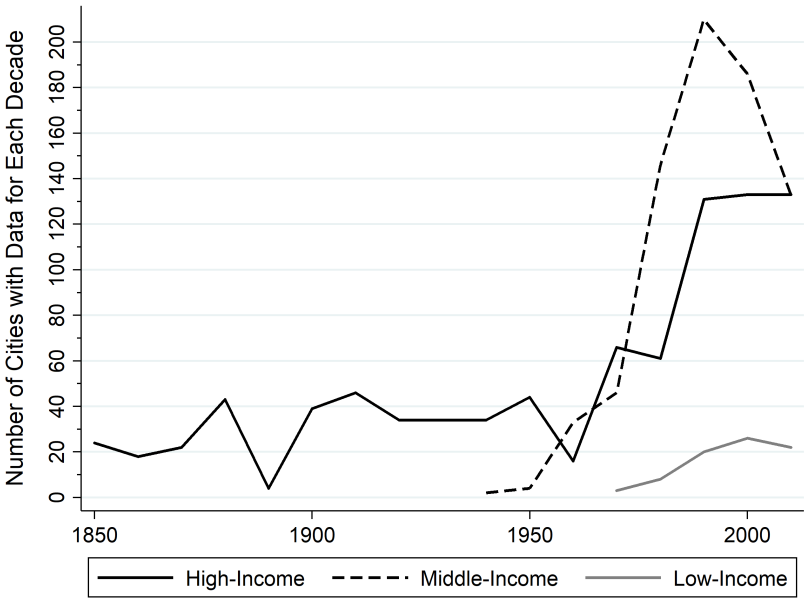
WEB APPENDIX: NOT FOR PUBLICATION

Figure A.1: **Sample of Mega-Cities with Age Structure Data, 1787-2016**



Notes: This figure shows as black hollow circles 410 mega-cities for which we have age structure data at any point (1787-2016). The figure also shows as black circles 351 out of these 410 mega-cities for which we have age structure data circa 1990 (1985-1996). "Mega-cities" in our analysis are cities that were among the 500 largest urban agglomerations in 2015 or the 100 largest urban agglomerations in 1900, or capital cities or primate cities in 2015 (N = 655). See the main text for data sources.

Figure A.2: **Number of City-Decade Observations with Available Dependency Ratios**

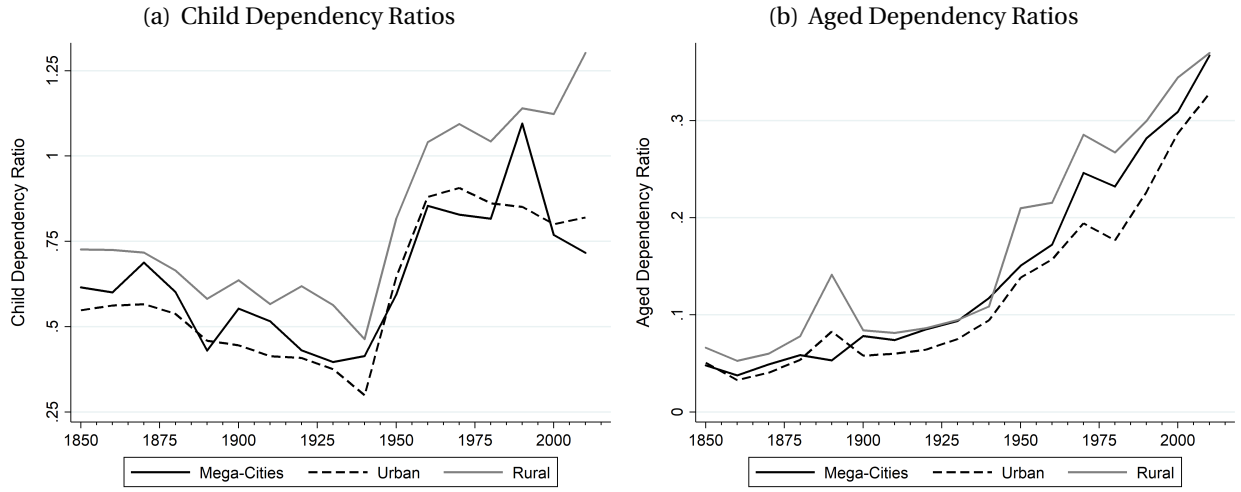


Notes: This figure shows for each income group of countries (defined ca. 2015) the evolution of the total number of city-decade observations for which we have data on the child and aged dependency ratios.

Figure A.3: **City Dependency Ratios and City Economic Development, ca 1990**

Notes: Figure 3(a) plots for our main econometric sample of 351 cities the relationship between the child dependency ratio, the ratio of the number of children (aged 0-14) to the number of working-age adults (aged 15-64), circa 1990 (1985-1996), and log mean night light intensity, i.e. the sum of night lights per area, in 1996. Figure 3(b) plots for the same sample the relationship between aged dependency ratios circa 1990 (1985-1996), the ratio of the number of seniors (aged 65+) to the number of working-age adults (aged 15-64), and log mean night light intensity in 1996. See the main text for data sources.

Figure A.4: **Evolution of Maximal City Child and Aged Dependency Ratios, All Areas**



Notes: Figure 4(a) shows for mega-cities, urban areas and rural areas the evolution of the mean pop.-weighted child dependency ratios when only considering the 10 highest ratios for each decade from 1850 to 2010. The child dependency ratio is the ratio of the number of children (aged 0-14) to the number of working-age adults (aged 15-64). Figure 4(b) shows for mega-cities, urban areas and rural areas the evolution of the mean pop.-weighted aged dependency ratios when only considering the 10 highest ratios for each decade from 1850 to 2010. The aged dependency ratio is the ratio of the number of children (65+) to the number of working-age adults (15-64). See the main text for data sources.

WEB APPENDIX: NOT FOR PUBLICATION

Table A1: **Evolution of City Child and Aged Dependency Ratios, Robustness**

	Coefficient of Correlation with the Baseline Evolution			
Evolution:	Means for Each Income Group		Mean of 10 Highest Ratios	
	(1)	(2)	(3)	(4)
Dependency Ratio:	Child	Aged	Child	Aged
1. Conditional on Log City Pop.	0.99	0.98	0.98	0.98
2. Keep Census-Based	0.99	0.98	0.95	0.95
3. Drop if Appears 1x Only	1.00	1.00	1.00	1.00
4. Drop if Appears 2x or Less	1.00	1.00	0.97	0.97
5. Drop if Appears 3x or Less	1.00	1.00	0.93	0.93
6. No Pop. Weights	0.99	1.00	0.99	0.99
7. w/o Top Bottom 5% in Ratios	0.96	0.99	0.80	0.80
8. Drop if Africa	0.99	1.00	0.92	0.92
9. Drop if Asia	0.99	0.99	1.00	1.00
10. Drop if Europe	0.99	0.99	0.99	0.99
11. Drop if North America	0.99	1.00	0.86	0.86
12. Drop if South America	1.00	1.00	1.00	1.00
13. Drop if Oceania	1.00	1.00	1.00	1.00
Observations	20-26	20-26	15	15

Notes: Columns (1)-(2) show the population-weighted mean child and aged dependency ratios for each income group-decade. We restrict the analysis to decade with at least five city-decade observations. Columns (3)-(4) show for each decade the population-weighted mean child and aged dependency ratios when considering the 10 highest ratios in the decade. The mean population of each city in each decade is used as weights. In row 1, we first regress the dependency ratios on log city populations and then use the means of the residuals in each decade. In row 2, we only keep census-based city observations. In rows 3-5, we drop the cities for which we have data in 1, 2 or 3 or fewer decades. In row 6, population weights are not used. In row 7, we drop the top and bottom 5% in dependency ratios in the full sample of city-years. In rows 8-13, we drop each continent one by one.

Table A2: **Descriptive Statistics for the Main Econometric Sample**

Main Variable:	Obs	Mean	Std. Dev.	Min	Max
Δ Log Mean NL 95-10	351	0.28	0.51	-0.74	2.03
Log Pop. 95	351	14.32	0.84	12.33	17.33
Log Mean NL 96	351	4.11	0.72	1.90	6.43
Δ Log Pop. 95-10	351	0.36	0.30	-0.22	1.61
TDR 90	351	0.55	0.16	0.22	1.37
CDR 90	351	0.44	0.19	0.10	1.29
ADR 90	351	0.11	0.07	0.01	0.35
CDR 0-9 90	341	0.29	0.12	0.10	0.73
CDR 10-14 90	341	0.14	0.05	0.05	0.29
ADR 65-74 90	340	0.07	0.04	0.01	0.19
ADR 75+ 90	335	0.04	0.03	0.00	0.16

Table A3: City Dependency Ratios and Economic Growth, Past Age Structure IVs

Dep. Var.:	Δ Log Mean Night Light (NL) Intensity 1996-2011								
	IV1: CDR & ADR 60-80			IV2: 5-Yr Pop. Sh. 60-80			IV3: Select 5-Yr Pop. Sh. 60-80		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CDR 90	-1.30**	-1.25**	-1.60*	-0.99***	-0.84**	-1.35**	-1.38**	-1.40**	-3.12**
	[0.51]	[0.55]	[0.94]	[0.37]	[0.35]	[0.63]	[0.58]	[0.64]	[1.39]
ADR 90	-2.47***	-2.24**	-1.57	-1.98**	-1.83**	-0.98	-2.47**	-2.45**	-3.21*
	[0.96]	[0.93]	[1.05]	[0.81]	[0.73]	[0.80]	[1.11]	[1.04]	[1.82]
Obs.	142	142	142	130	130	130	130	130	130
Ctrls	Y	Y	Y	Y	Y	Y	Y	Y	Y
FE	N	Cont.	Cntry	N	Cont.	Cntry	N	Cont.	Cntry
IV F-St.	21.13	18.90	8.317	7.145	6.115	8.973	5.521	4.464	2.335

Notes: N = 142-130. Col. (2), (5) & (8): 6 continent FE included. Col. (3), (6) & (9): 97 country FE included. The variables of interest are not the mean CDRs and ADRs in 1985-1996 but the CDRs and ADRs for the closest year to the year 1990 in the 1985-1996 period. Col. (1)-(3) (IV1): We use the available CDRs and ADRs for the closest year to the year 1960 in 1960-1980. Col. (4)-(6) (IV2): We use the available 5-year pop. shares of the city for the closest year to the year 1960 in 1960-1980. Col. (7)-(9) (IV3): Among the instruments used for IV2, we only keep the pop. shares for the 5-9, 10-14, 50-54, 55-59 and 60-64 year-olds. Robust SEs. * p<0.10, ** p<0.05, *** p<0.01.

Table A4: City Dependency Ratios and Economic Growth, Conditional IVs

Dep. Var.:	Δ Log Mean Night Light (NL) Intensity 1996-2011							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A:	IV1: CDR & ADR 60-80 (N = 142)							
CDR	-1.56**	-1.89**	-1.31***	-1.50**	-1.70**	-2.39*	-1.53**	-1.30
	[0.66]	[0.85]	[0.46]	[0.63]	[0.76]	[1.30]	[0.68]	[0.90]
ADR	-1.51**	-1.16*	-1.31**	-1.36**	-2.85**	-2.70**	-1.60*	-1.69**
	[0.73]	[0.60]	[0.63]	[0.62]	[1.36]	[1.32]	[0.87]	[0.85]
IV F-St.	17.57	12.79	34.77	26.94	14.09	7.948	26.87	13.63
Panel B:	IV2: 5-Year Pop. Sh. 60-80 (N = 130)							
CDR	-1.15**	-1.20**	-1.17***	-1.08**	-1.24*	-1.51**	-1.18**	-1.13*
	[0.47]	[0.50]	[0.40]	[0.52]	[0.64]	[0.74]	[0.59]	[0.69]
ADR	-1.04	-1.19**	-1.17*	-1.18**	-2.12*	-2.04*	-1.60*	-1.66*
	[0.68]	[0.57]	[0.63]	[0.57]	[1.13]	[1.07]	[0.93]	[0.93]
IV F-St.	6.867	6.907	10.88	6.661	4.273	3.846	5.911	4.170
Panel C:	IV3: Selected 5-Year Pop. Sh. 60-80 (N = 130)							
CDR	-1.58**	-1.88**	-1.46***	-1.82**	-2.44**	-3.55*	-1.95**	-2.37
	[0.73]	[0.93]	[0.57]	[0.82]	[1.12]	[1.85]	[0.85]	[1.47]
ADR	-1.34	-1.38*	-1.40*	-1.68**	-4.01**	-4.38**	-2.97**	-3.14*
	[0.88]	[0.71]	[0.82]	[0.80]	[1.87]	[2.20]	[1.44]	[1.66]
IV F-St.	5.782	4.184	7.410	4.840	4.184	3.202	4.841	2.172
Core Ctrls	Y	Y	Y	Y	Y	Y	Y	Y
Fixed Effects	N	Cont.	N	Cont.	N	Cont.	N	Cont.
Controls	pcgdp 60,80,96		fam. plan. 72-82		shares 10 relig. 70		all simultaneously	

Notes: N = 142-130 agglomerations. The IV specifications are the same as in Table A3 (see table notes for details). We add as controls log national per capita GDP (constant international dollars, PPP) in 1960, 1980 and 1996 and/or the national family planning index in 1972-1982 and/or the national population shares in 1970 of the 10 main religions in the world. The source for national per capita GDP is Maddison (2008), which we update using World Bank (2017). We then create four dummies for whether family planning was "very weak", "weak", "moderate" or "strong" in 1972-1982 based on the World Bank (2007) family planning index. Finally, we use the national population shares in 1970 of ten different religions (source: Barro and McCleary (2003)). Robust SEs. * p<0.10, ** p<0.05, *** p<0.01.

Table A5: **Robustness to Adding the Changes in the CDR & the ADR 1990-2010**

Dep. Var.:	△ Log Mean Light Intensity 1996-2011							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CDR 90	-0.95***	-0.63***	0.32	-0.57**	-1.21***	-0.98***	0.13	-0.87**
	[0.18]	[0.18]	[0.33]	[0.28]	[0.20]	[0.23]	[0.45]	[0.34]
ADR 90	-1.54***	-1.50***	-0.26	-1.24**	-0.60	-0.89**	-0.16	-0.62
	[0.35]	[0.38]	[0.55]	[0.58]	[0.42]	[0.43]	[0.67]	[0.85]
△ CDR 90-10					-1.80***	-1.39***	-0.46	-1.37***
					[0.30]	[0.36]	[0.57]	[0.50]
△ ADR 90-10					1.23**	0.86*	0.42	0.77
					[0.47]	[0.47]	[0.98]	[0.70]
Observations	289	289	289	93	289	289	289	93
Fixed Effects	N	Cont.	Cntry	N	N	Cont.	Cntry	N
Core Ctrls	Y	Y	Y	Y	Y	Y	Y	Y

Notes: CDR/ADR missing for 351 - 289 = 62 obs. ca. 2010 (2005-2016). Robust SEs.

Table A6: **Using Other Sets of Boundaries & Extensive vs. Intensive Margin**

Dep. Var.:	△ Log Mean Light Intensity 1996-2011							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Boundaries:	**Panel A:** Baseline Regressions: CIESIN (2017)				**Panel B:** European Commission, FUAs			
CDR 90	-1.12***	-0.87***	-0.13	-0.63**	-1.03***	-0.82***	-0.05	-0.59**
	[0.13]	[0.14]	[0.24]	[0.28]	[0.12]	[0.13]	[0.25]	[0.26]
ADR 90	-1.21***	-1.14***	0.10	-1.04*	-1.69***	-1.42***	-0.53	-1.07*
	[0.35]	[0.38]	[0.57]	[0.57]	[0.33]	[0.37]	[0.57]	[0.57]
Boundaries:	**Panel C:** Euro. Commission, Urban Clusters				**Panel D:** Ferreyra and Roberts (2018)			
CDR 90	-1.23***	-0.96***	0.02	-0.61**	-1.21***	-1.00***	-0.33	-0.63**
	[0.13]	[0.14]	[0.28]	[0.26]	[0.14]	[0.15]	[0.26]	[0.29]
ADR 90	-1.56***	-1.41***	-0.74	-0.89	-1.96***	-1.54***	-0.16	-1.14*
	[0.36]	[0.38]	[0.61]	[0.56]	[0.35]	[0.39]	[0.56]	[0.59]
Panel E:	*Brighter:* $\geq$ 75th Pctile Lights 1996				*Darker:* $<$ 75th Pctile Lights 1996			
CDR	-1.13***	-0.85***	0.10	-0.61**	-0.98***	-0.77***	-0.29	-0.56
	[0.13]	[0.15]	[0.26]	[0.26]	[0.14]	[0.15]	[0.26]	[0.36]
ADR	-1.43***	-1.29***	-0.18	-0.95*	-1.30***	-1.41***	-0.14	-1.20*
	[0.35]	[0.38]	[0.56]	[0.55]	[0.38]	[0.43]	[0.62]	[0.69]
Obs.	351	351	351	97	351	351	351	97
Fixed Effects	N	Cont.	Cntry	N	N	Cont.	Cntry	N
Core Ctrls	Y	Y	Y	Y	Y	Y	Y	Y

Notes: **Panel A:** We use the urban agglomeration boundaries from CIESIN (2017). **Panel B:** We use the boundaries from European Commission (2019) (Functional Urban Areas) (https://ghsl.jrc.ec.europa.eu/ghs_fua.php). **Panel C:** We use the boundaries from Florczyk et al. (2019) (Urban Clusters) (https://ghsl.jrc.ec.europa.eu/download.php?ds=smodhttps://ghsl.jrc.ec.europa.eu/ghs_smod2019.php). **Panel D:** We use the boundaries from Ferreyra and Roberts (2018). The data has also been used in Bosker et al. (2020). **Panel E:** We study how mean night light intensity varies if we only consider pixels that correspond to the cities' central areas vs. their peripheral areas, based on the Euclidean distance of the pixels to the central point of the cities. Robust SEs.

Table A7: **Direct and Indirect Effects of Children and Seniors on Earnings, I2D2**

Dep. Var.:	Dummy if Works		Log Work Hours		Log Hourly Wage		Log Monthly Wage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A:	Direct Effects (Including All Urban Individuals in the Samples)							
0-14 y.o.	-0.32***	-0.37***	-0.16***	-0.18***	-0.58***	-0.53***	-0.82***	-0.80***
	[0.00]	[0.00]	[0.05]	[0.04]	[0.09]	[0.04]	[0.07]	[0.05]
65+ y.o.	-0.37***	-0.42***	-0.26***	-0.28***	-0.09***	-0.09***	-0.36***	-0.38***
	[0.00]	[0.00]	[0.01]	[0.00]	[0.01]	[0.01]	[0.01]	[0.00]
Obs. (000s)	38,076	15,549	15,625	6,846	12,875	6,335	13,139	6,392
Adj. R2	0.30	0.34	0.14	0.16	0.91	0.85	0.91	0.83
Num. Country	122	52	122	52	122	52	122	52
Num. Sample	835	222	835	222	835	222	835	222
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Core Controls	Y	Y	Y	Y	Y	Y	Y	Y
Cntry-Dist. FE	N	Y	N	Y	N	Y	N	Y
Panel B:	Indirect Intra-Household Effects (Restricting to Urban Work.-Age Adults (15-64 y.o.))							
HH CDR	-0.02**	-0.04***	-0.04***	-0.03***	-0.05***	0.01**	-0.09***	-0.02***
	[0.01]	[0.00]	[0.01]	[0.00]	[0.02]	[0.01]	[0.01]	[0.00]
HH ADR	-0.05***	-0.03***	-0.01	-0.01	-0.06***	-0.05***	-0.07***	-0.06***
	[0.01]	[0.00]	[0.01]	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]
Obs. (000s)	27,530	10,790	12,435	6,093	12,435	6,093	12,691	6,148
Adj. R2	0.17	0.25	0.2	0.08	0.96	0.86	0.95	0.85
Num. Country	121	52	121	52	121	52	121	52
Num. Sample	829	222	829	222	829	222	829	222
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Core Controls	Y	Y	Y	Y	Y	Y	Y	Y
Cntry-Dist. FE	N	Y	N	Y	N	Y	N	Y
Panel C:	Indirect City-Wide Effects (Restricting to Urban Work.-Age Adults (15-64 y.o.))							
HH CDR	-0.05***	-0.01***	-0.03***	-0.05**	0.00	0.03	-0.02***	-0.02
	[0.00]	[0.00]	[0.00]	[0.02]	[0.00]	[0.03]	[0.00]	[0.01]
HH ADR	-0.06***	0.01	-0.02***	-0.00	-0.08***	-0.02	-0.10***	-0.02
	[0.00]	[0.02]	[0.00]	[0.02]	[0.01]	[0.03]	[0.01]	[0.03]
Local CDR	-0.07***	-0.08***	-0.11***	-0.16*	-0.44***	0.02	-0.55***	-0.14
	[0.02]	[0.02]	[0.04]	[0.09]	[0.10]	[0.18]	[0.10]	[0.11]
Local ADR	-0.02	-0.31***	-0.09**	-0.22	-0.56***	0.01	-0.66***	-0.20
	[0.03]	[0.05]	[0.04]	[0.32]	[0.11]	[0.76]	[0.12]	[0.45]
"Local" Level	Dist.	PSU	Dist.	PSU	Dist.	PSU	Dist.	PSU
Obs. (000s)	6,818	1,590	4,183	599	4,183	599	4,222	639
Adj. R2	0.24	0.20	0.14	0.16	0.85	0.82	0.83	0.87
Num. Country	24	34	24	34	24	34	24	34
Num. Sample	68	116	68	116	68	116	68	116
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Core Controls	Y	Y	Y	Y	Y	Y	Y	Y

Notes: We restrict the analysis to individuals classified as "urban" in the samples. We include country-year sample FE in all regressions. The core controls in Panel A include a male dummy, a married dummy, their interaction, and the number of years of education and its square. In Panels B and C, we also add age and age squared. Col. (2), (4), (5) and (8) in Panels A and B: We include sample-district FE. We call "districts" the third-level administrative unit of the country (when not available, we use second-level administrative units). Panel A: We use as weights the weights provided by each sample. Panels B and C: We use as weights the sample weights multiplied by the size of the individual's household. Robust SEs clustered at the household level in Panels A and B and at the district level in Panel C. * p<0.10, ** p<0.05, *** p<0.01.

Table A8: **Effects of Children and Seniors on Earnings, I2D2, Rural Obs. Only**

Dep. Var.:	Dummy if Works		Log Work Hours		Log Hourly Wage		Log Monthly Wage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A:	Direct Effects (Including Only Rural Individuals in the Samples)							
0-14 y.o.	-0.16***	-0.21***	-0.07	-0.31***	-0.28**	-0.10	-0.61***	-0.69***
	[0.00]	[0.00]	[0.07]	[0.10]	[0.11]	[0.14]	[0.08]	[0.10]
65+ y.o.	-0.19***	-0.26***	-0.17***	-0.25***	-0.17***	-0.17***	-0.38***	-0.45***
	[0.00]	[0.00]	[0.02]	[0.01]	[0.02]	[0.02]	[0.02]	[0.02]
Obs. (000s)	21,178	8,294	10,863	3,414	5,874	2,584	6,048	2,621
Adj. R2	0.23	0.27	0.18	0.17	0.85	0.78	0.86	0.80
Num. Country	119	51	118	51	118	51	118	51
Num. Sample	772	177	771	177	771	177	771	177
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Core Controls	Y	Y	Y	Y	Y	Y	Y	Y
Cntry-Dist. FE	N	Y	N	Y	N	Y	N	Y
Panel B:	Indirect Intra-Household Effects (Restricting to Rural Work.-Age Adults (15-64 y.o.))							
HH CDR	-0.01	-0.02***	-0.04***	-0.05***	-0.02	0.01	-0.08***	-0.04**
	[0.01]	[0.04]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]	[0.02]
HH ADR	-0.02**	-0.02	-0.02	-0.04	0.01	0.01	0.02	-0.02
	[0.01]	[0.01]	[0.02]	[0.03]	[0.03]	[0.05]	[0.03]	[0.04]
Obs. (000s)	18,624	5,389	5,579	2,434	5,579	2,434	5,745	2,469
Adj. R2	0.19	0.26	0.21	0.09	0.95	0.71	0.97	0.73
Num. Country	119	51	118	51	118	51	118	51
Num. Sample	767	177	766	177	766	177	766	177

Notes: We restrict the analysis to individuals classified as "rural" in the samples. We include country-year sample fixed effects in all regressions. The core controls in Panel A include a male dummy, a married dummy, their interaction, and the number of years of education and its square. In Panel B, we also add age and age squared. Col. (2), (4), (5) and (8) in Panels A and B: We also include sample-district fixed effects. We call "districts" the third-level administrative unit of the country (when not available, we use second-level administrative units of the countryu). Panel A: We use as weights the weights provided by each sample. Panel B: We use as weights the sample weights multiplied by the size of the individual's household. Robust SEs clustered at the household level in Panels A and B. * p<0.10, ** p<0.05, *** p<0.01.

Table A9: **Direct and Indirect Effects of Children and Seniors on Time Use for the U.S.**

Dep. Var.:	Number of Minutes Spent Per Day on ... During the Week (Monday-Friday)							
	Personal Care of Relatives		Work, Education or Job Training		Sleep		Leisure & Other Activ.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A:	Indirect Intra-Household Effects (Restricting to Urban Work.-Age Adults (15-64 y.o.))							
HH CDR	67.8***	67.8***	-35.4***	-35.9***	-5.5***	-5.3***	-26.9***	-26.7***
	[1.9]	[1.9]	[2.4]	[2.4]	[1.4]	[1.4]	[2.1]	[2.0]
HH ADR	-10.9**	-10.1**	-18.5**	-17.0**	7.3	6.8	22.1***	20.3***
	[4.5]	[4.3]	[7.9]	[7.7]	[4.6]	[4.6]	[6.8]	[6.4]
Core Ctrls	Y	Y	Y	Y	Y	Y	Y	Y
MSA-County FE	N	Y	N	Y	N	Y	N	Y
Obs.	57,956	57,956	57,956	57,956	57,956	57,956	57,956	57,956
Adj. R2	0.26	0.26	0.20	0.21	0.10	0.11	0.12	0.13
Panel B:	Indirect City-Wide Effects (Restricting to Urban Work.-Age Adults (15-64 y.o.))							
HH CDR	67.7***	67.7***	-36.0***	-36.1***	-5.2***	-5.2***	-26.5***	-26.4***
	[2.1]	[2.1]	[2.5]	[2.5]	[1.2]	[1.2]	[2.3]	[2.3]
HH ADR	-10.6**	-10.7**	-18.0**	-18.1**	7.2	7.2	21.5***	21.5***
	[4.5]	[4.5]	[7.4]	[7.4]	[4.9]	[4.8]	[6.7]	[6.7]
Local CDR	41.8*	38.8*	-0.9	33.2	-29.3	-42.8*	-11.6	-29.3
	[24.0]	[20.6]	[39.3]	[38.2]	[19.1]	[21.8]	[31.6]	[26.9]
Local ADR	14.3	39.3*	-31.6	-45.6	-8.6	-17.6	25.9	24.0
	[20.3]	[22.5]	[36.1]	[41.4]	[19.7]	[21.7]	[30.3]	[36.0]
Core Ctrls	Y	Y	Y	Y	Y	Y	Y	Y
"Local" Level	MSA	county	MSA	county	MSA	county	MSA	county
Obs.	57,956	57,956	57,956	57,956	57,956	57,956	57,956	57,956
Adj. R2	0.26	0.26	0.20	0.20	0.10	0.10	0.13	0.13

Notes: We restrict the analysis to individuals belonging to any MSA in the samples. We include year-month of interview FE in all regressions. The core controls include a male dummy, a married dummy, their interaction, the number of years of education and its square, age and its square, and day of the week FE. We use as weights the sample weights multiplied by the size of the individual's household. Robust SEs clustered at the household level in Panel A and at the MSA or county level in Panel B. * p<0.10, ** p<0.05, *** p<0.01.