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# Territorial Productivity Differences and Dynamics within Latin American Countries

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## Abstract

The paper documents the evolution of territorial disparities in labor and location productivity in 14 countries in Latin America, using millions of observations from harmonized household surveys and censuses. Between the early 2000s and the late 2010s, most countries in the region experienced significant reductions in regional inequality as real labor incomes and location productivity premia converged at the first and second administrative levels. The leveling up reflected both the slowdown in productivity growth in affluent predominantly urban municipalities and the catchup of relatively poor, predominantly rural municipalities. Absolute convergence narrowed the labor income gaps with leading metropolitan areas, including the disparitites exploitable through migration, especially among the bottom 40 percent of households, as cities de-industrialized, yet continued to attract migrants. On the eve of the Covid-19 pandemic, income disparities with leading metropolitan areas remained high in nearly all countries, largely due to differences in educational attainment, but in a few countries, large differences in returns to endowments indicate potentially significant returns to migration to the leading metropolitan areas, especially for residents of relatively poor, remote regions. Rather than a clear rural-urban-metropolitan divide, in most countries the paper documents substantial overlap between the location-premia distributions of different types of second-level administrative areas and small differences between the average urban and rural place productivity premia.


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# Territorial Productivity Differences and Dynamics within Latin American Countries

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## 1. Introduction

Territorial differences in labor earnings are expected to diminish with economic development as barriers to capital mobility decline and technology diffuses within countries. However, they may persist due to poverty traps[1] reflecting delays in subnational institutional development (Galvis and Meisel Roca, 2021) and in economies where mobility frictions are high. By making it costly to trade goods and relocate workers, frictions generate spatial misallocation and slow down aggregate economic growth. Yet, a decline in mobility frictions may not result in measurable improvements in aggregate economic growth when territorial income differences are not exploitable through migration, but rather reflect difference due to the sorting of more productive workers into urban agglomerations. If people lack the endowments that could enable them to earn higher real wages after relocating to high-income areas, migration may contribute to congestion there, and ultimately lower the local productivity premium (Grover, Lall, and Maloney, 2022). Importantly, even in the absence of mobility barriers, territorial income differences may persist and even grow due to market-driven agglomeration forces (Duranton and Puga 2020), which may lead to labor shortages in fast-growing urban centers. Conversely, leveling up may occur as local productivity in leading regions deteriorates and conditions in smaller lagging areas improve. Hence, a priori, it is unclear how large within-country territorial income differences are, how much they have changed over time, and to what extent income differnecs can be exploited through migration.

This paper answers these questions by documenting the territorial differences in labor earnings in fourteen Latin American countries[2] and their evolution between the early 2000s and the late 2010s, using millions of observations from recently released, harmonized micro data from population censuses and household surveys. Exploring this topic in the Latin American context is important for several reasons. First, prior to the mid-2000s, large territorial income differences within the Latin American counties have been documented in the literature, including between Mexico's North and South (Aroca, Bosch, and Maloney, 2005; Gonzalez Rivas, 2007), Colombia's peripheral and core regions (Galvis and Maisel Roca, 2010 and 2012; Burger, Hendriks and Ianchovichina, 2022), and Peru's coastal and internal areas (Escobal and Ponce, 2011). Many studies conducted in the first half of the 2000s also question the idea of territorial income convergence in the region (Aroca et al. 2005; Bosch, Aroca, Fernandez, and Azzoni, 2003) or show that convergence has occurred at a very slow pace (Serra, Pazmino, Lindow, Sutton and Ramirez, 2006; Soto and Torche, 2004).

Second, territorial differences in income may explain a sizable share of overall inequality in a country (Elbers, Lanjouw, Mistiaen, Özler and Simler, 2004). Using survey data for eleven Latin American countries for the 2000s, Acemoglu and Dell (2010) investigate the sources of labor income inequality within and between countries in the Americas. They show that the within-municipality differences in labor income are five times the between-municipality differences, which in turn are twice the size of the between-country differences in labor income in the region. Skoufias and Lopez-Acevedo (2009) also find large differences in poverty rates and household incomes across geographic regions,

[1] In turn, poverty traps may influence territorial growth through increased social fragmentation, underinvestment, and political instability and conflict (Alesina and Perotti, 1996).

[2] The countries are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Honduras, Mexico, Panama, Paraguay, Peru, and Uruguay.

especially in Bolivia, Honduras, and Peru, and much larger differences in poverty rates between urban and rural areas within geographic regions in Ecuador, Guatemala, and Nicaragua.

Third, territorial income disparities pose serious policy challenges in both developing and developed countries. In the Middle East and North Africa, they have been associated with political instability and the Arab Spring uprisings (Ianchovichina, 2018; World Bank, 2020). In advanced economies, they have been linked to growing political and social polarization. In the UK, support for Brexit was strongest in the country's lagging regions (Rodriguez-Pose, 2018), which were also hit harder than other areas by the austerity policies implemented in response to the financial crisis in 2009 (Dorling and Thomlison, 2019). Crafting policies that address such challenges requires a good understanding of the size and dynamics in territorial income differences.

The paper makes several contributions to the literature. Previous studies look at issues of territorial income differences and dynamics separately, cover one or limited number of countries, employ disparate data sources – either national accounts or household surveys – and rely on value added or expenditure data at the first administrative level up to the early 2000s. Therefore, such studies may not be able to provide a complete or consistent regional picture on the size and evolution of territorial income differences within the Latin American countries in more recent years. This paper explores labor and place productivity differences and convergence dynamics during the pre-pandemic period between the early 2000s and the late 2010s using labor income data from a harmonized set of micro surveys for most countries in the region. We employ household labor earnings, deflated to address price variations across time and space, in the estimation of location premia at the 1st and 2nd administrative levels, following the approach of Li and Rama (2015). We then categorize 2nd level administrative units (i.e. municipalities) based on their population size and share of urban residents and thus gauge the magnitude and evolution of location premia while controlling for the size and type of the administrative area. This way the paper estimates the local productivity premia in both rural and urban 2nd level administrative areas, while Quintero and Roberts (2018) only provide a snapshot of the variation in urban location premia within countries in Latin America.

Finally, the paper estimates the labor income gaps with the leading metropolitan area[3] in each country and the gaps for different socioeconomic groups, differentiated based on income (i.e. the bottom 40%), skill levels, locality type (i.e. urban/rural), and gender. This type of analysis is important for two reasons. First, as the largest business centers, the leading metropolitan areas host a major share of the country's labor force and attract the most productive migrants. A decomposition of the income gaps with the leading area into differences in endowments and differences in the returns to these endowments allows us to assess the extent to which the income gaps can be exploited through migration by different population groups. Skoufias and Lopez-Acevedo (2009) undertake a similar analysis across and within geographic regions. However, they do not focus on the leading metropolitan areas and do not estimate how the income gaps vary across population groups with different skills or by gender.

The paper provides evidence of absolute convergence in real per capita household labor incomes, labor and place productivity at the 1st and 2nd administrative levels between the early 2000s and the late 2010s in most Latin American countries. Convergence reduced regional inequality and reflected the expansion of agribusiness and extractive activities during the Golden Decade (2003-2013), which

[3] The leading area /city is the main pole(s) of economic activity in the country.

brought investments and increased productivity in lagging, predominantly rural areas and the slowdown in productivity growth in more affluent, urban areas, where employment shifted toward less dynamic, low-productivity nontradables as cities de-industrialized (Jedwab et al., 2022). Convergence also narrowed the income gaps with leading metropolitan areas, including the gaps exploitable through migration to the top locations, especially among the bottom 40 percent. Still, at the end of the 2010s, there were sizable differences in per capita household labor earnings with the leading areas in nearly all countries, mainly reflecting differences in educational attainment, in line with the sorting of skilled workers in leading areas, but in a few countries large differences in the returns to endowments indicate potentially significant reutrns to migration to the leading areas, especially for residents of the poorest, remote regions. Rather than a clear rural-urban-metropolitan divide, the location-premia distributions of different locality types overlapped to a great degree and differences in the average location productivity premia in urban and rural areas were relatively small in most countries. While the places with the highest location premia were not necessarily the leading metropolitian areas, in all cases, they were among the top 25 percent of most productive localities.

The remainder of the paper is organized as follows. Section 2 reviews the literature. Section 3 discusses the methodology and the data, while Section 4 presents the empirical results. Section 5 summarizes the findings and offers conluding remarks.

## 2. The literature

There is a large literature on the size and evolution of territorial differences in income and welfare in Latin America. Most studies that belong to this literature focus on one country or a limited set of countries, use data up to the early 2000s, and rely on per capita GDP data at the first administrative level (i.e. states, provinces, or departments). Most studies find evidence of absolute convergence at the first administrative level, albeit at a speed below the one observed in developed countries, in Brazil (Azzoni, 2001; Serra et al., 2006), Chile (Serra et al., 2006), Peru (Serra et al., 2006; Iacovone, Sanchez-Bayardo and Sharma, 2015), and Colombia (Serra et al., 2006), but not in Argentina (Serra et al., 2006) and Mexico (Rodriguez-Pose and Sanchez-Reaza 2002; Chiquiar 2005; Serra et al., 2006). In the latter, convergence was observed up to the mid-1980s, but not afterwards. In spatially polarized countries, such as Brazil, Chile and Peru, convergence is found to be stronger within regional clubs.

A strand of this literature explores regional income dynamics by sector. Using sectoral value added data, Iacovone et al. (2015) find absolute convergence in the Peruvian manufacturing and mining sectors, but not in services and agriculture. Iacovone et al. (2015) attribute the lack of convergence in poverty rates across departments to limited reallocation of labor toward the converging sectors, while Sotelo (2020) suggests that this could also be due to substantial regional differences in farm income. He links these differences to spatial variations in trade costs and land quality and the practice of farmers to allocate land to many crops, which differ in land intensity. In Mexico, growth in tourism has also had uneven spatial effects. Faber and Gaubert (2019) show that the local economic effects of tourism are in part driven by significant positive spillovers from manufacturing. However, these local spillovers are mostly offset by reduced agglomeration econonomies in less touristic regions.

Another strand of this literature explores the effects of trade liberalization during the 1990s and early 2000s and increased demand for commodities on regional income dynamics. Chiquiar (2005) shows that NAFTA did not reverse the pattern of divergence in Mexico's state per capita GDP between 1985 and 2001; it benefited states endowed with better human capital and infrastructure and hurt the states with less productive agriculture in the South. In Brazil, trade liberalization in the early 1990s led

to increasingly large negative effects on earnings and employment in regions exposed to deeper tariff cuts (Kovak, 2013; Dix-Carneiro and Kovak, 2017). Since the more affluent regions, including the country's leading areas such as São Paulo, Belo Horizonte, and Rio de Janeiro, experienced larger tariff cuts, liberalization contributed to a decline in inter-regional inequality. Costa et al. (2016) find that strong productivity growth in China led to the de-industrialization of Brazilian cities, but generated demand for Brazilian commodity exports. Hence, they also conclude that the "China shock" reduced regional inequality in Brazil. In Peru, Sotelo (2020) finds that increased global demand for grains and higher grain prices have had uneven rural-urban effects, benefiting farmers, but hurting urban consumers.

A collection of studies uses survey data from the late 1990s to the early 2000s to document territorial household income differences and dynamics in nine Latin American economies.[4] The analysis is conducted at the 2nd administrative level, except in Colombia, where it is at the 1st administrative level, and Ecuador, where the data are at the level of the parish, which is a sub-division of the 2nd administrative level. The synthesis of the results from these studies, provided by Modrego and Berdegué (2016), indicates slow, absolute convergence of mean household incomes in Brazil (Favareto and Abramovay, 2016), Colombia (Fernández et al. 2016), Ecuador (Larrea et al. 2016), Guatemala (Romero and Zapil Ajxup, 2009), and Mexico (Yúnez Naude et al., 2016),[5] but not in Chile (Modrego et al., 2016), and Peru (Escobal and Ponce, 2016). However, the results from these country studies are not directly comparable due to differences in the definitions used in each country for poverty lines, income, and other indicators, and differences in the level of aggregation of territorial units. In addition, none of these studies uses regional price indexes to adjust incomes and poverty lines for cost-of-living differences.

Related to this literature are studies focusing on the factors shaping territorial income differences and their evoluation. Among these factors are (i) physical geography and natural endowments (Olfert et al., 2014); (ii) human capital and the tendency of people to sort spatially in response to labor market, amenities, cost of living, and cultural considerations; (iii) place-based investments in physical and technological infrastructure and institutions of importance to economic activity and social life (e.g. financial services); and (iv) the spatial structure of economic activity, which is shaped by agglomeration forces, market access, learning externalities, and migration frictions, among other factors.

In Latin America, territorial differences in labor income have been explained by differences in fundamentals, including resource endowments (Mesquita Moreira et al., 2013), human capital (Skoufias and Lopez-Acevedo, 2009; Acemoglu and Dell, 2010; Modrego and Berdegué, 2016),[6] local

[4] These countries include Brazil, Chile, Colombia, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, and Peru.
[5] Davalos et al. (2015) reach a similar conclusion of income convergence using municipality-level income data for Mexico from 1990 to 2010, while Lopez-Calva et al. (2021) find absolute convergence from 1992 to 2014 using a unique five wave panel dataset at the municipal level. The convergence process in both cases stemmed from a combination of positive developments in poor municipalities and stagnation or negative growth in richer ones.
[6] While the synthesis in Modrego and Berdegué (2016) confirms the role of human capital in the convergence process in most Latin American countries, they conclude that the relevance of other factors is country specific.

institutions that determine the provision of local public services (Acemoglu and Dell, 2010),[7,8] and migration frictions in the form of high trade costs (Acemoglue and Dell, 2010) and migration barriers (Skoufias and Lopez-Acevedo, 2009),

Using household surveys from the early 2000s and Oaxaca's (1973) decomposition, Skoufias and Lopez-Acevedo (2009) contribute a comprehensive study of spatial differences in welfare and their determinants within and across geographic regions above the first administrative level in 8 LAC countries.[9] Within any given region, they find that rural areas are poorer than urban areas primarily because of differences in education levels, and not differences in returns to education. Hence, they conclude that migration within regions has equalized these returns. By contrast, across geographic regions, differences in returns explain a larger share of the welfare gap, signaling that mobility barriers tend to grow with distance. Skoufias and Lopez-Acevedo (2009) also characterize the profile of domestic migrants, their incentives to migrate, and the characteristics of sending and receiving regions. Migrants are typically well-educated, young, and relatively well-off, come from regions with relatively low stock of skills, and therefore tend to drain the lagging regions from skilled workers, potentially exacerbating territorial inequality. Migrant remittances may have an offsetting effect (Acosta, Fajnzylber and Lopez, 2008), but research suggests that this effect is less likely to occur if most migrants are skilled workers. The latter tend to migrate on a permanent basis and are more likely to be affluent (Skoufias and Lopze-Acevedo, 2009). Kanbur and Rapoport (2005) also question the quantitative importance of remittances for reducing territorial welfare differences.

In sum, the existing literature relies on disparate data sources – either national accounts or household surveys – and looks at issues of territorial income differences and dynamics separately. Therefore, it provides an incomplete or inconsistent regional picture on the sources and evolution of territorial income differences in Latin America. By differentiating between households and localities and by combining analyses of territorial labor and local productivity differences and dynamics, this paper builds a region-wide assessment of the spatial patterns in local productivity levels and growth. It also identifies the main factors behind the territorial income differences with leading metropolitan areas and therefore opportunities to lift welfare through migration to these areas.

## 3. Analytical approach

We first present the methodology employed to estimate labor and place productivity by location, the approach for assessing productivity dynamics, and the estimation technique for decomposing the income gap with leading areas into an endowment component and a rate-of-return component. The latter allows us to determine the extent to which households can increase their incomes by relocating to the leading metropolitan area.

[7] In countries with federal systems (e.g. Mexico and Brazil), state and local governments have the authority to change laws, including taxes, and de jure and de facto institutions, e.g., the degree of enforcement of national laws, the functioning of the judiciary, and the degree of de facto control by local elites.

[8] Dell (2010) links the poor outcomes for some communities to the long-run effect of the mita – an extensive forced mining labor system in effect in Peru and Bolivia during the colonial era – which lowered incomes and access to education and infrastructure. Acemoglu et al. (2007) emphasize the link between political inequality in 19th century Cundinamarca, Colombia and its current economic outcomes. Similar conclusions are drawn by Naritomi, Soares, and Assuncao (2007) for Brazil.

[9] These countries are Bolivia, Brazil, Colombia, Ecuador, Guatemala, Mexico, Nicaragua, and Peru.

*3.1 Methodology*

We proxy labor productivity with the real average per capita household labor income[10] in locality $l$, represented in logs, $ln(y_{h,l,t})$, and alternatively, with the location premia before sorting, $\gamma_{l,t}^{bs}$, which represents local labor productivity, net of the effect of any time-varient exogenous shocks, captured by the time-fixed effect, $\theta_t$:

$$ln(y_{h,l,t}) = \gamma_{l,t}^{bs} + \theta_t + \varepsilon_{h,l,t} \quad (1)$$

The location premium after sorting, $\gamma_{l,t}^{as}$, in locality $l$ at time $t$, also referred to as the place productivity premium, is defined as the fraction of per capita household labor income that cannot be accounted for by the household *h*'s observable, non-geographic characteristics, $X_{h,l,t}$ (Skoufias and Lopez-Acevedo, 2009; Quintero and Roberts, 2018; and Li and Rama, 2015). We can then differentiate the contribution of individual, portable characteristics and place-specific effects to labor earnings as follows:

$$ln(y_{h,l,t}) = \gamma_{l,t}^{as} + \psi X_{h,l,t} + \theta_t + \varepsilon_{h,l,t} \quad (2)$$

The set of observable portable characteristics, $X_{h,l,t}$, are listed in Appendix Table A1 and include the gender of the household head, the household size, the age of the household head and household members, along with their squared values, the household head's level of education and employment status, and the highest educational attainment in the household. Time dummies capture the effect of exogenous shocks, such as commodity price fluctuations, while the inclusion of many observable characteristics addresses issues related to sorting and mitigates to some extent the omission of unobservable non-geographic characteristics such as entrepreneurial spirit and commitment to hard work.

The assessment of territorial productivity dynamics relies on the standard model:

$$g_{l,t,t+T} = \alpha + \beta y_{l,t} + \mu_{l,t}, \quad (3)$$

which correlates growth $g_{l,t,t+T}$ in the respective productivity measure – $y_{l,t}$, $\gamma_{l,t}^{bs}$, or $\gamma_{l,t}^{as}$ – in locality $l$ between period *t* and *t*+*T* with its corresponding level in the initial period *t*. We estimate (3) at the 1st administrative level, and in most cases at the 2nd administrative level and by settlement type. Depending on the size of the country and data availability, we are also able to differentiate between large and small settlement types. In a few cases, we estimate models (1), (2), and (3) only at the 1st administrative level due to data limitations.

The decomposition of the income gap with the leading metropolitan area into an endowment component, reflecting sorting, and a returns-to-endowment component, capturing the portion of the gap that can be exploited through migration requires us to estimate per capita labor income as a linear function of the same portable endowment household characteristics included in (1) and a disturbance term $\varepsilon_{h,A,t}$ at time *t* in the leading metropolitan area, *A*, and the rest of the country, *R*, respectively:

$$ln(y_{h,A,t}) = X_{h,A,t}'\psi_{A,t} + \varepsilon_{h,A,t} \quad (4)$$

[10] Labor income is a better proxy for labor productivity than total income or expenditure and is reported more accurately than total income.

$$ln(y_{h,R,t}) = X_{h,R,t}'\psi_{R,t} + \varepsilon_{h,R,t}. \quad (5)$$

The estimated returns to the portable household variables in regressions (4) and (5), $\hat{\psi}_{A,t}$ and $\hat{\psi}_{R,t}$, capture the influence of geographic features of the respective locations, including infrastructure, local institutions, and other factors of the location correlated with the controls. We then use (4) and (5), following the geographic analogue of the Blinder-Oaxaca decomposition, to decompose the average income gap with the leading metropolitan area among household heads into the two components:

$$\overline{ln(y_{A,t})} - \overline{ln(y_{R,t})} = (\bar{X}_{A,t} - \bar{X}_{R,t})'\hat{\psi}_{R,t} + \bar{X}_{A,t}'(\hat{\psi}_{A,t} - \hat{\psi}_{R,t}). \quad (6)$$

The first component on the right-hand side of (6) represents the differences between the portable endowments of the households in the leading area and the rest of the country. It captures the sorting (selection) of people into the leading area and any sectoral differences between the economy in the leading area and that of the rest of the country. The second component on the right-hand side of (6) measures the difference between the returns to portable, observable endowments and any other omitted variables in the leading area and the rest of the country. This component reflects the extent to which the income gap could be exploited through migration to the leading area as it captures the effects of any barriers to migration and differences in local productivity, for example due to agglomeration economies, market access, learning externalities, institutional quality, and infrastructure services. However, differences due to measurement error may also play a role and affect the interpretation of the results for policy purposes. For example, since the quality of education in lagging regions or secondary cities is likely lower than that in the leading city, the returns to education in the lagging region or secondary city will appear lower than the returns to education in the leading area, although the returns to the quality-adjusted years of education may be the same. Moreover, in the long-run, migration to high productivity places may not have the desired productivity-boosting effect at the aggregate level, if it leads to congestion and negative agglomeration economies (Grover et al., 2022).

It is evident from (2) and (6) that when the average returns to endowments are approximately equal to the average returns to endowments outside the leading area ( i.e. $\hat{\psi}_t \approx \psi_{R,t}$) – a condition likely to be met since the leading area is typically one or only a few municipalities – the difference between the estimated location premia after sorting in A and R is approximately equal to the difference in the returns to portable endowments in A and R:

$$\hat{\gamma}_{A,t}^{as} - \hat{\gamma}_{R,t}^{as} \approx \bar{X}_{A,t}'(\hat{\psi}_{A,t} - \hat{\psi}_{R,t}). \quad (7)$$

where $\hat{\gamma}_{R,t}^{as}$ is expected to be close to the average or median estimated location premia after sorting, $\hat{\gamma}_t^{as}$. In countries where the estimated location premium in the leading area is much higher than the average or median premium in the country, we expect larger exploitable gap due to migration and larger estimated rate-of-return component in the Blinder-Oaxaca decomposition.

*3.2 Data*

The analysis employs recently released and previously unavailable harmonized micro data for more than a dozen Latin American countries. In the cases of Brazil and Mexico, the investigation relies on census microdata, harmonized by the Institute for Social Research and Data Innovation – IPUMS

International at the University of Minnesota. In both cases, the census questionnaires include a module on income in addition to the standard questions on household and individual characteristics. Furthermore, the harmonization protocol ensures the comparability of geographical units across census years. In all other country cases, we use the Socio-Economic Database for Latin America and the Caribbean (SEDLAC), which includes country harmonized household surveys jointly constructed by the Center for Distributive, Labor and Social Studies (CEDLAS) at the Universidad National de La Plata and the World Bank's Poverty Group for the Latin America and the Caribbean region.[11] Most countries have conducted the surveys on an annual basis since 2000, but the frequency varies by country.[12] Only in Colombia, the analysis at the 2nd administrative level relies on per capita value-added data for the last ten years from the National Administrative Department of Statistics (DANE). Since neither the value-added data source, nor SEDLAC provides household information, it is impossible to estimate place productivity premia after sorting in Colombia.

The criteria for selecting survey years included the availability of information to harmonize geo-codes across survey years at the lowest possible administrative level and maximize the number of surveyed locations across time. Two to three consecutive surveys were selected to have adequate coverage at three specific time periods in the past twenty years: the early 2000s, the late 2000s, and the late 2010s. Thus, the sample includes only countries with enough information to identify sub-national administrative units, ensure comparability across space and time, and minimize standard errors of point estimates at lower administrative levels.

In some instances a particular survey was not used for reasons not mentioned above. A decision was made to exclude the 2000 Panama survey to minimize location re-coding. From 2001 onwards, Panama's administrative units remained stable up to 2017. El Salvador was also excluded from the analysis because of potential issues related to the switch in currencies in the early 2000s. Choosing 2005 as the initial period did not help because this resulted in a substantial decline in the number of surveyed locations available in 2005 and at the end of the 2010s, which biases the estimation of the location premia. Appendix Table A2 summarizes information on data sources, level of geographic detail, and time coverage.

The income gap analyses employ only household survey data, which, unlike the census data, extend all the way to the end of the 2010s. In most countries, we are able to match the first and last periods in the income gap analyses with the first and last periods in the estimation of location premia. By linking the two types of analyses, we are able to perform consistency check (7).

We deflate labor earnings to address price variations across time and space and to ensure that the results are comparable both within and across countries. First, we convert labor income into constant 2011 US$ PPP. We then adjust the converted income to reflect differences across subnational regions, and whenever possible different types of areas within subnational regions (i.e., rural versus urban). Appendix Table A3 provides information on the data used to calculate the deflators.[13] Descriptive

[11] See https://www.cedlas.econo.unlp.edu.ar/wp/en/estadisticas/sedlac/

[12] Appendix Table A5 provides information on the year and sample size by country. In the case of Argentina, the surveys cover only urban areas so the categories are reduced to all urban residents, the bottom 40% of urban residents, and skilled urban residents. In the case of Uruguay, the surveys cover primarily urban areas.

[13] In the absence of a deflator for a particular year, the deflator for the next closest year was used (case of Ecuador 2004, Panama 2010 and 2012). https://statistics.cepal.org/portal/cepalstat/index.html?lang=es.

statistics are presented in Appendix Table A4, while Appendix Table A6 provides details on the definition of leading metropolitan areas. Given its large size, Brazil's leading metropolitan area includes three of its largest urban agglomerations – Rio de Janeiro, São Paulo, and Belo Horizonte. In all other countries, except Ecuador and Panama, the largest city is the leading metropolitan area. In Ecuador, Quito is the leading area, while urban Panama province, which includes Panama City, is the leading metropolitan area in Panama.

**Table 1. The urban gradient: definitions of locality types**

| Locality type | Population size | Share of urban residents (%) | Share of metropolitan residents (%) |
|---|---|---|---|
| **Mexico** | | | |
| Urban-Metro (large) | ≥ 300,000 | > 50% | > 50% |
| Urban-Metro (small) | < 300,000 | > 50% | > 50% |
| Urban (large) | ≥ 20,000 | > 50% | ≤ 50% |
| Urban (small) | < 20,000 | > 50% | ≤ 50% |
| Rural (large) | ≥ 10,000 | ≤ 50% | ≤ 50% |
| Rural (small) | < 10,000 | ≤ 50% | ≤ 50% |
| **Brazil** | | | |
| Urban-Metro (large) | ≥ 300,000 | > 50% | > 50% |
| Urban-Metro (small) | < 300,000 | > 50% | > 50% |
| Urban (large) | ≥ 50,000 | > 50% | ≤ 50% |
| Urban (small) | < 50,000 | > 50% | ≤ 50% |
| Rural (large) | ≥ 30,000 | ≤ 50% | ≤ 50% |
| Rural (small) | < 30,000 | ≤ 50% | ≤ 50% |
| **Colombia** | | | |
| Urban-Metro | | All designated as metro areas in 2011 | |
| Urban (large) | ≥ 20,000 | > 50% | Nonmetro areas |
| Urban (small) | < 20,000 | > 50% | Nonmetro areas |
| Rural (large) | ≥ 10,000 | ≤ 50% | Nonmetro areas |
| Rural (small) | < 10,000 | ≤ 50% | Nonmetro areas |
| **All other LAC countries** | | | |
| Urban | | > 50% | |
| Rural | | ≤ 50% | |

We explore the variation in productivity across different types of 2nd level administrative units, defined using an urban gradient that varies with the size of the country and territorial coverage of the data. In the cases of Brazil and Mexico, using the rich information in the IPUMS population censuses, it is possible to distinguish between six types of municipalities: large metropolitan areas; small metropolitan areas; large urban areas; small urban areas; large rural areas; and small rural areas. Table 1 lists the criteria for defining the different types of localities in each country case. For example, in Mexico, large metropolitan areas are municipalities with 300,000 or more people of whom more than 50 percent reside in urban households (as of 2000) and more than 50% are metropolitan residents. In Brazil, metropolitan municipalities are defined as in the case of Mexico, but urban and rural municipalities are considerably larger (Table 1). In Colombia, official aggregates of value added at the second administrative level are used to define five types of municipalities. In this case, metropolitan municipalities are those designated as such as of 2011. In all other countries, municipalities where the

urban population share is above 50 percent (circa 2000) are considered urban while the rest are classified as rural.

**Table 2. Municipality types: definitions and descriptive statistics**

| | N | Avg. growth | Std. Dev. Growth | Density | Complete secondary | Self-employment share | Wage earners |
|---|---|---|---|---|---|---|---|
| **Mexico** | | **2000-15** | | | | **2000** | |
| Urban-Metro (large) | 41 | 0.003 | 0.017 | 1820 | 0.19 | 0.22 | 0.74 |
| Urban-Metro (small) | 72 | 0.012 | 0.018 | 735 | 0.16 | 0.24 | 0.71 |
| Urban (large) | 358 | 0.017 | 0.021 | 369 | 0.11 | 0.27 | 0.64 |
| Urban (small) | 440 | 0.030 | 0.027 | 168 | 0.08 | 0.33 | 0.56 |
| Rural (large) | 587 | 0.030 | 0.029 | 70 | 0.05 | 0.35 | 0.49 |
| Rural (small) | 832 | 0.049 | 0.044 | 41 | 0.04 | 0.43 | 0.36 |
| **Brazil** | | **2000-10** | | | | **2000** | |
| Urban-Metro (large) | 46 | 0.011 | 0.009 | 3438 | 0.25 | 0.24 | 0.75 |
| Urban-Metro (small) | 176 | 0.013 | 0.014 | 691 | 0.17 | 0.24 | 0.74 |
| Urban (large) | 434 | 0.016 | 0.015 | 139 | 0.16 | 0.31 | 0.65 |
| Urban (small) | 842 | 0.018 | 0.019 | 50 | 0.13 | 0.31 | 0.64 |
| Rural (large) | 317 | 0.029 | 0.017 | 34 | 0.07 | 0.44 | 0.43 |
| Rural (small) | 225 | 0.028 | 0.024 | 31 | 0.08 | 0.44 | 0.42 |
| **Colombia** | | **2011-19** | | | | | |
| Metro | 59 | 0.028 | 0.033 | | | | |
| Urban (large) | 168 | 0.020 | 0.045 | | | | |
| Urban (small) | 150 | 0.016 | 0.051 | | | | |
| Rural (large) | 341 | 0.021 | 0.040 | | | | |
| Rural (small) | 404 | 0.028 | 0.055 | | | | |
| **Peru** | | **2000/03-2017/19** | | | | **2000/03** | |
| Urban | 71 | 0.030 | 0.016 | | 0.237 | 0.502 | 0.398 |
| Rural | 115 | 0.046 | 0.021 | | 0.127 | 0.756 | 0.183 |
| **Ecuador** | | **2003/04-2017/19** | | | | **2003/04** | |
| Urban | 69 | 0.024 | 0.025 | | 0.125 | 0.396 | 0.524 |
| Rural | 122 | 0.036 | 0.029 | | 0.077 | 0.529 | 0.385 |
| **Chile** | | **2000/03-2015/17** | | | | **2000/03** | |
| Urban | 201 | 0.030 | 0.016 | | 0.238 | 0.213 | 0.691 |
| Rural | 98 | 0.036 | 0.014 | | 0.117 | 0.291 | 0.569 |
| **Dominican Republic** | | **2000/02-2014/16** | | | | **2000/02** | |
| Urban | 51 | 0.007 | 0.020 | | 0.107 | 0.383 | 0.445 |
| Rural | 64 | 0.015 | 0.028 | | 0.049 | 0.530 | 0.297 |
| **Honduras** | | **2004/06-2017/19** | | | | **2004/06** | |
| Urban | 34 | 0.005 | 0.030 | | 0.089 | 0.444 | 0.423 |
| Rural | 210 | 0.004 | 0.038 | | 0.042 | 0.597 | 0.278 |
| **Costa Rica** | | **2001/03-2008/09** | | | | **2001/03** | |
| Urban | 30 | 0.019 | 0.022 | | 0.142 | 0.277 | 0.634 |
| Rural | 49 | 0.031 | 0.025 | | 0.079 | 0.315 | 0.591 |

Table 2 displayes the number of different types of localities, obtained based on the classification in Table 1, along with their socioeconomic characteristics. In most countries, there are more rural than urban or metropolitan municipalities. Brazil and Chile are exceptions. In the former, there are more

small urban municipalities than any other municipality type. In the latter, there are more urban than rural municipalities. In all countries, the shares of residents with secondary education and wage earners increase with the urban gradient.

## 4. Empirical results

This section first presents the estimated location premia before and after sorting at the 1st administrative level, and whenever possible, at the 2nd administrative level. It then reports results on territorial productivity dynamics by administrative level and type of locality. Finally, the section presents the income gaps with leading metropolitan areas and the factors behind them, followed by a discussion of the decompositions by administrative region and socioeconomic group.

### *4.1 Estimated location premia by administrative region*

Figure 1 shows estimates of local productivity premia before and after sorting in the late 2010s at the 2nd administrative level (e.g., municipality) in Brazil, Chile, Costa Rica, Mexico, the Dominican Republic, Ecuador, El Salvador, Honduras, and Peru, and at the first administrative region (i.e., state/province/department) in Argentina, Bolivia, Colombia, Uruguay, and Panama. These results, obtained by estimating respectively (1) and (2), suggest that the location premia before sorting substantially vary across and within countries in Latin America (Figure 1A). The places with highest labor productivity premia in the region are resource-rich areas as well as urbanized regions, some of which are the leading metropolitan areas, identified with black dots on the maps. More productive workers are attracted to these places to advantage of strong positive learning externalities available in proximity to other skilled workers (Quintero and Roberts, 2018)[14,15] and better consumer amenities.[16] However, once sorting is taken into account, the place productivity premia in the leading metropolitan areas is much lower than the labor productivity premia (Figure 1B).

A comparison of location premia estimates in the early 2000s and the late 2010s reveals a reduction in the spatial variation of productivity measures within countries (Table 3). In all countries, the spatial variation in the location premia before sorting (Table 3, columns (4) and (5)) is larger than the spatial variation in location premia after sorting (Table 3, columns (6) and (7)). Yet, sorting does not completely reduce the variation in the location premia. In the early 2000s, for the set of countries with municipal-level information, the spatial variation in the location premia after sorting – measured with the coefficient of variation to ensure cross-country comparability – was highest in Peru, Mexico, Honduras, and Brazil, while for those with only state or provincial information, it was highest in Bolivia and Panama (Table 3, column (8)). By the end of the 2010s, the territorial variation in place productivity declined in all countries, but the change was relatively small in Honduras and Panama

[14] Static productivity gains stem from agglomeration economies, while dynamic productivity gains come from learning by working. De La Roca and Puga (2017) provide evidence that the additional value of experience gained in bigger cities persists after leaving the city.

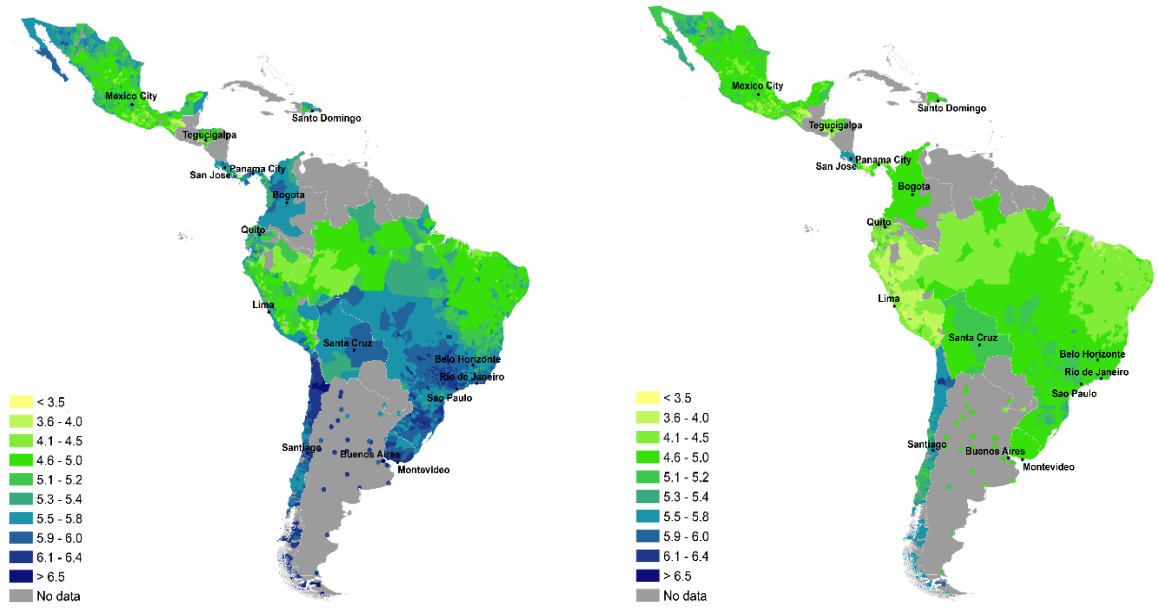
[15] Diamond (2016) finds that local labor demand changes are the primary reason for the increased skill sorting, but amenities have also adjusted to reinforce this effect in the US from 1980 to 2000.

[16] Glaeser, Kolko, and Saiz (2001) argue that consumption amenities, such as restaurants, stores, or public services, are important for attracting firms and skilled workers, who tend to earn higher incomes and place greater value on the quality and variety of amenities. Big cities supply a greater variety and quality of amenities as they are bigger markets.

(Table 3, columns (6) and (7)). Thus, among the countries with information at the 2nd administrative level, opportunities for increased incomes through spatial arbitrage remained most significant in Brazil, Honduras, Mexico, and Peru (Table 3, column (9)).

**Figure 1. Estimated location premia before and after sorting in the late 2010s in Latin America and the Caribbean**

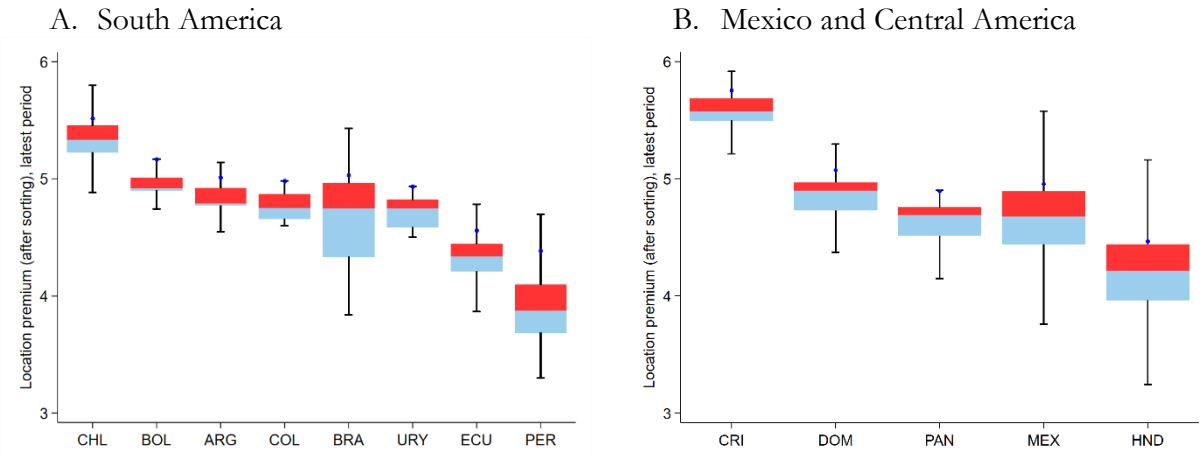
**Panel A. Location premia before sorting** **Panel B. Location premia after sorting**




Note: *The location premiums before sorting are the labor productivity premiums, while the location premiums after sorting are the place productivity premiums. **The latest available period is 2015 for Mexico, 2010 for Brazil, 2017-19 for Argentina, Bolivia, Colombia, Panama, Peru, Ecuador, Honduras, and Uruguay, 2015-17 for Chile, 2014-16 for the Dominican Republic, and 2008-09 for Costa Rica. ***For Bolivia, Colombia, Panama, and Uruguay, these are estimates at the first administrative level (e.g., State). For Argentina, these are estimates at the level of the urban agglomeration, shown as dots on the maps. For the rest of the countries, these are estimates at the second administrative level (e.g., municipalities). ****To ensure comparability within and across countries, the per capita household labor earnings are deflated to adjust incomes for cost-of-living differences across space and time.

There were also cross-country differences in the median location premiums after sorting in the late 2010s (Figure 2). Median place productivity was considerably higher in Chile and Costa Rica and relatively low in Honduras and Peru. Importantly, in all cases, the average place productivity premia in the leading metropolitan areas – marked with blue dots in Figure 2 – were above the 75th percentile of the location premia distribution. Only in Bolivia, Colombia, Panama, and Uruguay, the average location premium in the leading metropolitan area was near the maximum location premia observed in the respective country.

**Figure 2. Spatial variations in place productivity premiums by country in Latin America**




Note: The figures show the estimated location premiums after sorting $\gamma_l^{as}$ (i.e., the place productivity premiums) for the last period T in location $l$ and estimated using regresions model (2). The upper and lower caps indicate the maximum and minimum estimated premiums. The bottom of each box marks the location premium of the bottom 25%. The top of the box marks the location premium of the top 75%. Each box changes color from light blue to red at the estimated median location premium. Finally, the blue-dot marker identifies the average location premium of the municipalities comprising the leading metropolitan area within each country.

**Table 3. Standard deviations and coefficients of variation in labor and place productivity premiums**

| | Adm Level | Initial Period 0 | Last Period T | $\sigma_{\gamma_0^{bs}}$ | $\sigma_{\gamma_T^{bs}}$ | $\sigma_{\gamma_0^{as}}$ | $\sigma_{\gamma_T^{as}}$ | $CV_{\gamma_0^{as}}$ | $CV_{\gamma_T^{as}}$ |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Argentina | 1 | 2003-05 | 2017-19 | 0.31 | 0.25 | 0.21 | 0.20 | 5.30 | 4.07 |
| Bolivia | 1 | 2001-02 | 2017-19 | 0.44 | 0.24 | 0.39 | 0.18 | 9.26 | 3.59 |
| Colombia | 1 | 2001-03 | 2017-19 | 0.25 | 0.19 | 0.14 | 0.11 | 3.43 | 2.35 |
| Panama | 1 | 2001-03 | 2017-19 | 0.65 | 0.62 | 0.27 | 0.27 | 6.61 | 5.86 |
| Uruguay | 1 | 2000-02 | 2017-19 | 0.22 | 0.20 | 0.16 | 0.13 | 3.67 | 2.78 |
| Brazil | 2 | 2000 | 2014-15 | 0.57 | 0.53 | 0.40 | 0.36 | 8.97 | 4.93 |
| Chile | 2 | 2000-03 | 2015-17 | 0.39 | 0.28 | 0.24 | 0.20 | 5.30 | 3.78 |
| Costa Rica | 2 | 2001-03 | 2008-09 | 0.37 | 0.18 | 0.20 | 0.18 | 3.87 | 3.24 |
| Dominican Republic | 2 | 2000-02 | 2014-16 | 0.35 | 0.28 | 0.27 | 0.21 | 5.54 | 4.24 |
| Ecuador | 2 | 2003-04 | 2017-19 | 0.38 | 0.30 | 0.27 | 0.19 | 7.09 | 4.47 |
| Honduras | 2 | 2004-06 | 2017-19 | 0.50 | 0.46 | 0.38 | 0.35 | 9.20 | 8.38 |
| Mexico | 2 | 2000 | 2015 | 0.55 | 0.45 | 0.46 | 0.35 | 10.49 | 7.62 |
| Peru | 2 | 2000-03 | 2017-19 | 0.56 | 0.43 | 0.37 | 0.27 | 11.24 | 6.98 |

Note: $\sigma_{\gamma^{bs}}$ and $\sigma_{\gamma^{as}}$ are the standard deviations of the estimated location premiums before sorting (i.e., the labor productivity premiums) and the location premium after sorting (i.e., the place productivity premiums), respectively. $CV_{\gamma^{bs}}$ and $CV_{\gamma^{as}}$ are the coefficients of variation in the estimated location premiums before and after sorting, respectively. Column (1) provides the level of regional aggregation. Columns (4), (6), and (8) show results for the initial period, specified in column (2). Columns (5), (7), and (9) show results for the end period, specified in column (3). The standard deviation allows us to compare the variation in the productivity variables over time by country, while the CV allows us to make cross-country comparisons of the variation in the productivity premia estimated at the same level of regional aggregation. Premia estimated at the 1st administrative level are shown in the top panel of the table, while those estimated at the 2nd administrative level are shown in the bottom panel. In the case of Brazil, the indicators for 2014-15 are computed with household data from SEDLAC, while for 2000 with the data from the IPUMS population census.

The OLS estimates of location premia after sorting may be biased if the error term $\varepsilon_{h,l,t}$ in regression model (2) is spatially correlated with errors in neighboring locations $\varepsilon_{h,\tilde{l},t}$ (Aselin 2003). We assess the extent of spatial autocorrelation by performing the following tests on the residuals. First, for each country, we average the residuals across locations and evaluate whether these mean residuals are closely distributed around zero. This first test suggests that there is no clustering of residuals at location level. Second, we formally test for spatial autocorrelation of the mean residuals using the Moran's I test for global spatial autocorrelation. The index for this test can be obtained by estimating the following regression:

$$Wz = \rho z + \varepsilon, \qquad (8)$$

where $z$ is the standardized variable of interest (e.g., residuals, location premia), $Wz$ is the spatial lag of the variable $z$ and $W$ is the spatial weight matrix (Anselin 1995). The Moran's I statistic $\rho$ takes values between [-1,1] and evaluates the extent to which locations are interdependent. A positive (negative) value of Moran's I indicates that positive (negative) spatial autocorrelation exists across locations. Appendix Table A7 shows estimates $\hat{\rho}$ of the Moran's I statistic along with p-values testing the null hypothesis for randomization or absence of spatial autocorrelation. The results in columns 1 and 2 of this table indicate that we cannot reject the absence of spatial autocorrelation of residuals. The absence of spatial autocorrelation of residuals implies that the OLS estimates of location premia after sorting are unbiased. Yet, the estimated location effects are spatially correlated as shown in columns 3 and 4 of Appendix Table A7.

*4.2 Estimated location premia by municipality type*

In line with the steep rise of population density along the urban gradient (Table 2), the denser the municipality, the further to the right is its distribution (Figure 3) and the higher its average location premia (Table 4). This is expected as economic agents benefit from stronger agglomeration economies and better learning externalities and market access in municipalities with higher population density. However, the rural-urban differences in average location premia at the end of the 2010s are small in most cases (last two columns of Table 4). Rather than a clear rural-urban-metropolitan divide, there is a gradation in labor and place productivity premia by type of municipality.

The location premia density charts, displayed in Figure 3, overlap in all cases to different extents. In Mexico, the highest location premia are not observed in the largest metropolitan areas, but in a few smaller metropolitan areas, large urban centers, and even some rural municipalities. Still, because the variation of location premia in larger metropolitan/urban areas is smaller, on average the location premia in less dense rural municipalities are lower than those in denser metropolitan areas.

In Brazil, the overlap of the rural and urban density plots is much less pronounced. There is a clear double-hump rural-urban pattern of lotion effects, which shows that the majority of rural municipalities have lower productivity premia than the majority of urban or metropolitan municipalities. In Colombia, the overlap in location premia by type of municipality is akin to the one observed in Mexico.[17] In Chile and the Dominican Republic, except for a few urban municipalities

[17] We do not have data to estimate location premia after sorting by type of settlement in Colombia because SEDLAC data do not offer household information below the 1st administrative region.

where the location premia are highest, the rural and urban distributions almost completely overlap, indicating relatively high place productivity in rural areas, as shown in Table 4. In the rest of the countries, the least productive localities are rural areas, while the most productive municipalities are urban areas in Peru and Ecuador.

**Table 4. Mean Estimated Location Premiums before and after Sorting by Type of Locality, Period, and Country in Latin America**

**Panel A. Rural versus Urban Average Location Premia**

| | Before Sorting | | | | After Sorting | | | |
|---|---|---|---|---|---|---|---|---|
| | Early 2000s | | Late 2010s | | Early 2000s | | Late 2010s | |
| | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| Brazil | 5.37 | 4.72 | 5.62 | 5.01 | 4.52 | 4.10 | 4.77 | 4.39 |
| Mexico | 4.79 | 4.45 | 4.97 | 4.68 | 4.54 | 4.30 | 4.75 | 4.58 |
| Costa Rica | 5.78 | 5.38 | 5.62 | 5.54 | 5.16 | 5.01 | 5.62 | 5.54 |
| Dominican Republic | 5.32 | 5.15 | 5.36 | 5.29 | 4.96 | 4.88 | 4.87 | 4.83 |
| Ecuador | 4.87 | 4.56 | 5.44 | 5.18 | 4.05 | 4.00 | 4.38 | 4.28 |
| Honduras | 4.91 | 4.47 | 5.02 | 4.61 | 4.29 | 4.11 | 4.42 | 4.18 |
| Chile | 5.22 | 4.91 | 5.91 | 5.74 | 4.52 | 4.42 | 5.38 | 5.31 |
| Peru | 4.71 | 3.97 | 5.26 | 4.69 | 3.58 | 3.17 | 4.09 | 3.78 |

**Panel B. Average Location Premia by Type of Locality**

| | Before sorting, early 2000s | | | | | | After sorting, early 2000s | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metro-large | Metro-small | Urban-large | Urban-small | Rural-large | Rural-small | Urban-Metro | Urban-Metro | Urban-large | Urban-Small | Rural-large | Rural-small |
| Brazil | 5.83 | 5.59 | 5.41 | 5.28 | 4.70 | 4.75 | 4.70 | 4.68 | 4.53 | 4.46 | 4.09 | 4.12 |
| Mexico | 5.43 | 5.17 | 4.91 | 4.58 | 4.54 | 4.38 | 4.89 | 4.76 | 4.63 | 4.39 | 4.40 | 4.23 |
| | Before sorting, late 2010s | | | | | | After sorting, late 2010s | | | | | |
| | Urban-Metro | Urban-Metro | Urban-large | Urban-Small | Rural-large | Rural-small | Urban-Metro | Urban-Metro | Urban-large | Urban-Small | Rural-large | Rural-small |
| Brazil | 5.98 | 5.79 | 5.65 | 5.55 | 4.99 | 5.04 | 4.93 | 4.91 | 4.78 | 4.73 | 4.37 | 4.41 |
| Mexico | 5.41 | 5.28 | 5.05 | 4.82 | 4.69 | 4.67 | 5.00 | 4.93 | 4.81 | 4.65 | 4.58 | 4.58 |

Note: Table 1 defines the urban gradient and different types of localities.

**Figure 3. Location premia before and after sorting by type of locality at the end of the 2010s**

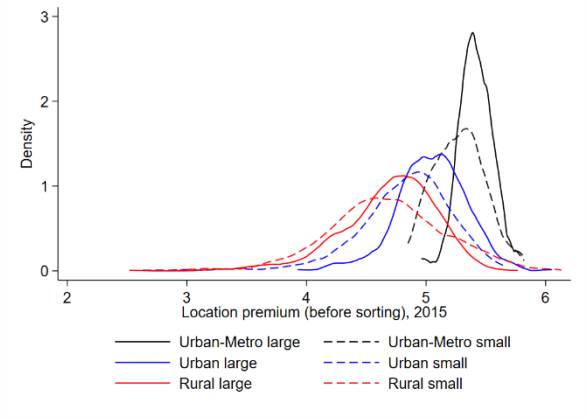
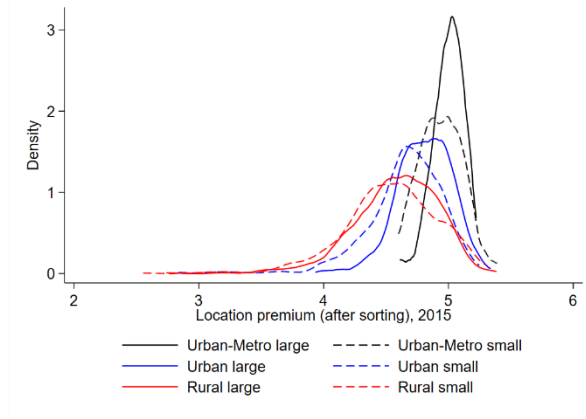
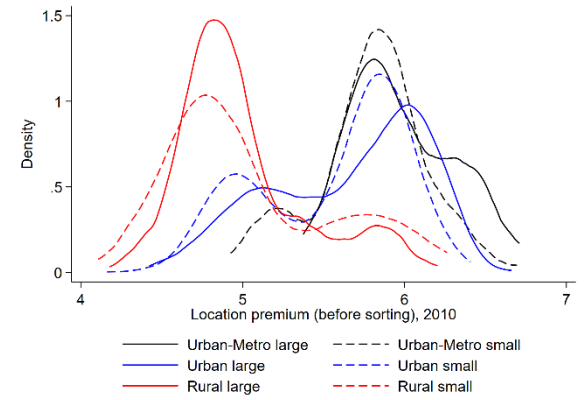
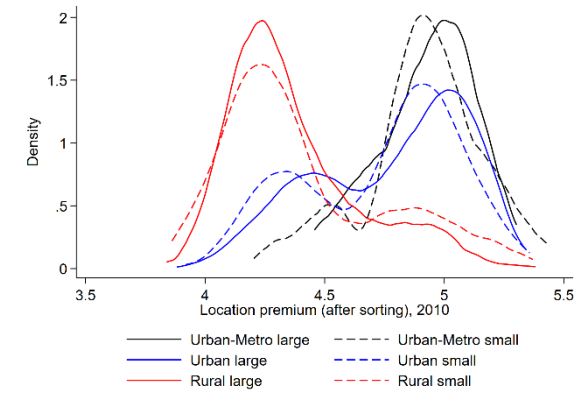
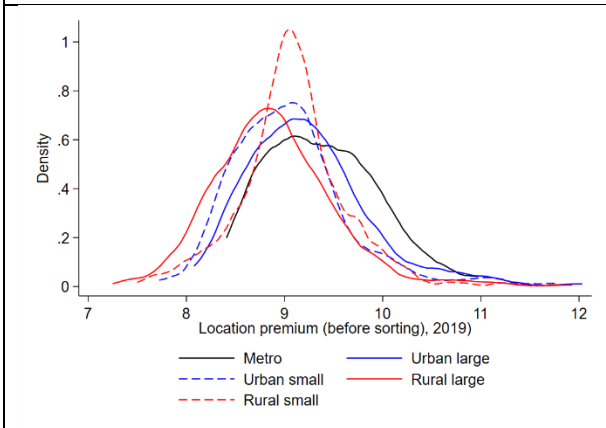
| Location premia before sorting ($\gamma_{l,t}^{bs}$) | Location premia after sorting ($\gamma_{l,t}^{as}$) |
|---|---|
| **Panel A. Mexico** | |
|  |  |
| **Panel B. Brazil** | |
|  |  |
| **Panel C. Colombia** | |
|  | |

**Figure 3. Location premia before and after sorting by type of locality at the end of the 2010s (contd.)**

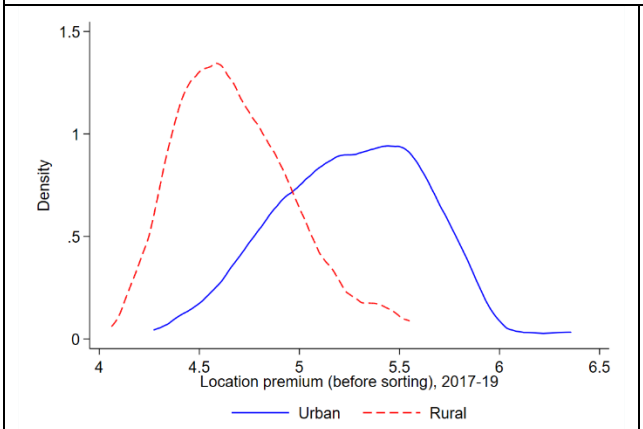
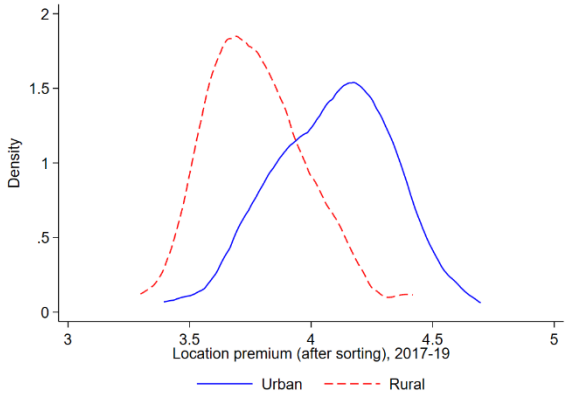
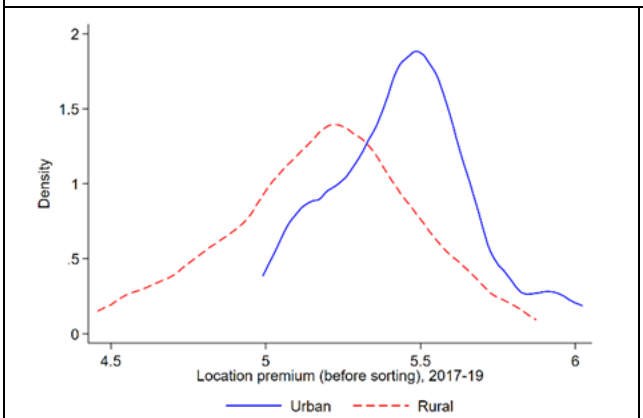
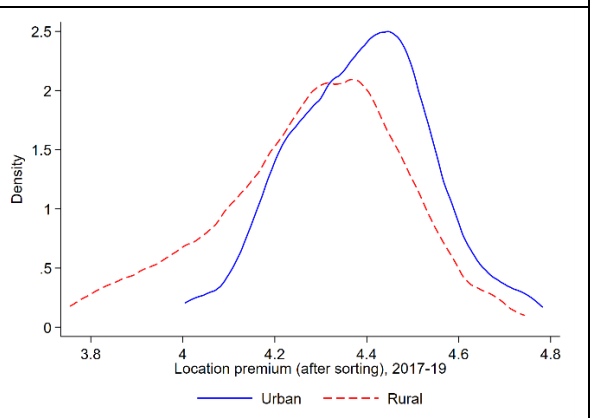
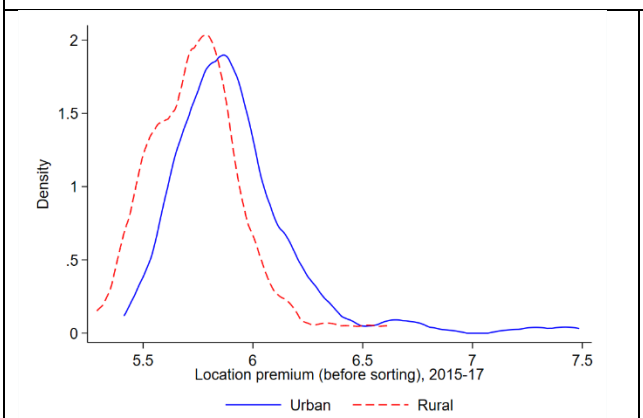
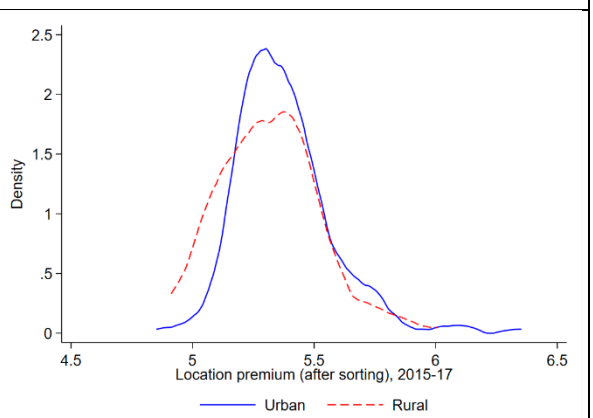
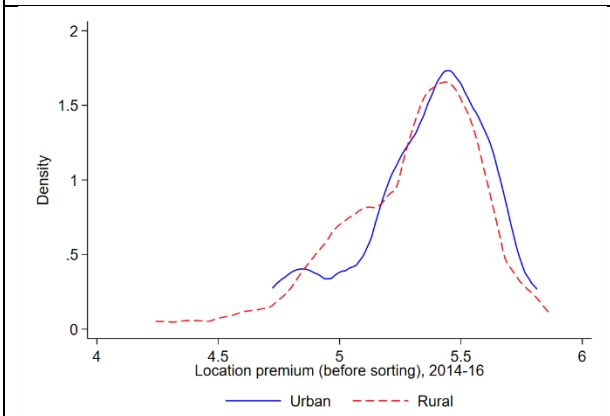
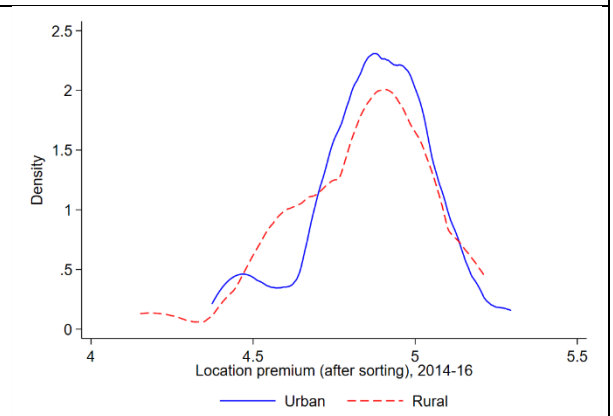
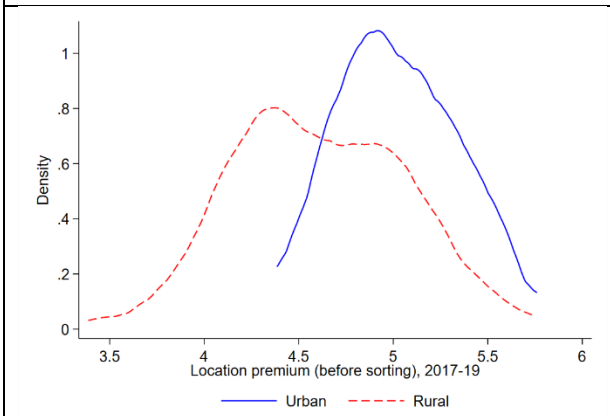
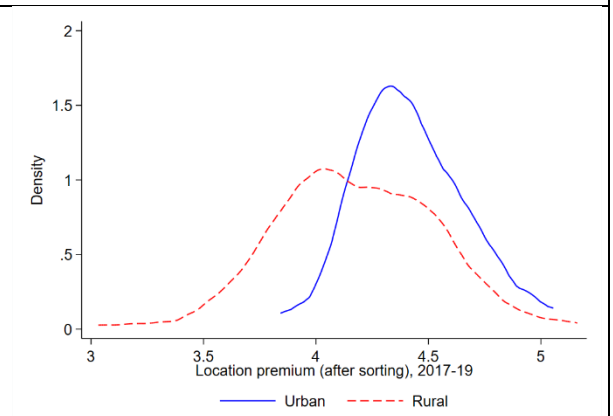
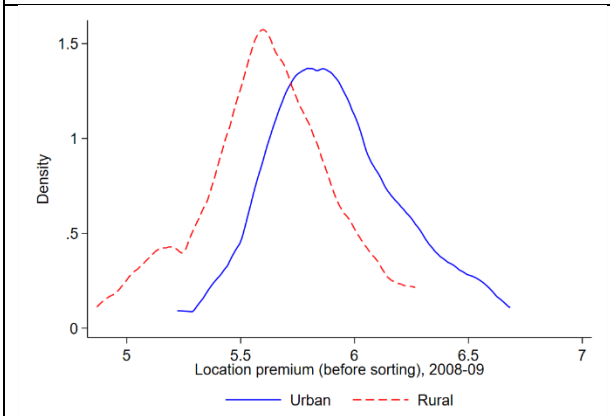
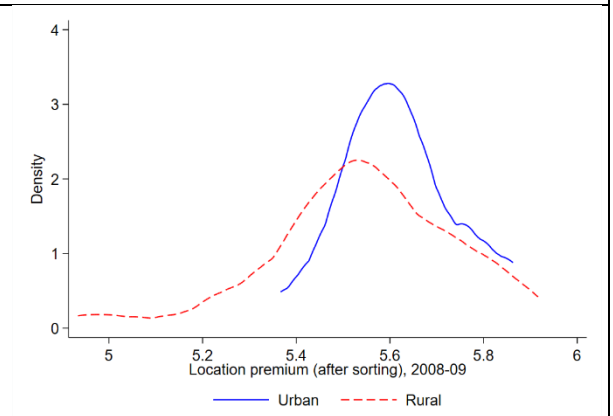
| Location premia before sorting ($\gamma_{l,t}^{bs}$) | Location premia after sorting ($\gamma_{l,t}^{as}$) |
|---|---|
| **Panel D. Peru** | |
|  |  |
| **Panel E. Ecuador** | |
|  |  |
| **Panel F. Chile** | |
|  |  |

**Figure 3. Location premia before and after sorting by type of locality at the end of the 2010s (contd.)**

| Location premia before sorting ($\gamma_{l,t}^{bs}$) | Location premia after sorting ($\gamma_{l,t}^{as}$) |
|---|---|
| **Panel G. Dominican Republic** | |
|  |  |
| **Panel H. Honduras** | |
|  |  |
| **Panel I. Costa Rica** | |
|  |  |

*4.3 Territorial productivity dynamics*

This section reports results on territorial productivity dynamics, obtained by estimating regression model (3). Absolute convergence in real per capita household labor incomes at the 1st and 2nd administrative levels is observed in most Latin American countries (Table 5). At the 1st administrative level, which refers to states, provinces, and departments, income convergence was relatively fast only in Bolivia, Colombia, Ecuador, Dominican Republic, and Mexico (see column 1 of Table 5). In these countries, the rate of convergence was faster than the 2 percent benchmark recorded during past convergence episodes in advanced economies. In Argentina, Brazil, Honduras, Peru, and Uruguay, the rate of convergence was just below the benchmark of 2 percent per year. Absolute convergence occurred at a slower pace in Chile and Panama. Only in Costa Rica, absolute convergence was observed at the lower canton level, but not at the 1st administrative level. In all countries with information at both administrative levels, absolute convergence was faster at the 2nd administrative level (Table 5).

Convergence can be partly attributed to the commodity boom during the Golden Decade (2003-13). With the rise of commodity rents due to increased demand for resources and agricultural products in China and other fast-growing economies, there were increases in investments and productivity in rural areas (Rodrígues, 2011; Rowe 2014; Adão 2015).[18] At the same time, the Dutch Disease effects of the commodity windfall, and in some countries, remittances, along with steep foreign competition from China, and advances in labor-saving technologies (Beylis et al., 2020), eroded the competitiveness of the manufacturing sector (Venables, 2017) and shifted employment away from urban tradables (Jedwab et al., 2022), especially in the largest cities, where laid off workers switched mostly to informal, lower quality jobs in the non-tradable sectors (Dix-Carneiro and Kovak, 2017; Dix-Carneiro and Kovak, 2019; Ponczek and Ulyssea, 2022). Altogether, these developments improved productivity in predominantly rural areas relatively more than productivity in large urban areas, resulting in absolute convergence in labor and place productivity premia in most Latin American countries (Appendix Tables A8 and Table 6). These results are in line with the findings in Dix-Carneiro and Kovak (2017) and Costa et al. (2016) who respectively show that trade liberalization and the "China Shock" resulted in reduced regional inequality in Brazi, while López-Calva et al. (2021) find absolute convergence in total incomes and poverty in Mexico from 2000 to 2014. They attribute it to positive developments in the poorest municipalities and stagnant or deteriorating performance of affluent ones.

[18] Adão (2015) documents an increase of 8%-16% in the commodity wage premium (relative to non-commodities) in Brazil due to the rise in world commodity prices from 1991 to 2010.

**Table 5. Absolute convergence in real per capita household labor income at different administrative levels by country and period**

| | Annual per capita growth | | | | | |
|---|---|---|---|---|---|---|
| | Administrative level 1 | | | Admininistrative level 2 | | |
| **Mexico** | 1990-15 | 2000-10 | 2000-15 | 1990-15 | 2000-10 | 2000-15 |
| Log $Y_0$ | -0.0142*** | -0.0285*** | -0.0265*** | -0.0243*** | -0.0262*** | -0.0310*** |
| | (0.00378) | (0.00665) | (0.00476) | (0.000394) | (0.00109) | (0.000609) |
| Obs. | 32 | 32 | 32 | 2,303 | 2,330 | 2,320 |
| R-squared | 0.319 | 0.380 | 0.507 | 0.624 | 0.197 | 0.528 |
| **Brazil** | 2002/04-2014/15 | 2000-10 | 2009/11-2014/15 | 2002/04-2014/15 | 2000-10 | 2009/11-2014/15 |
| Log $Y_0$ | -0.0107** | -0.0189*** | -0.00817 | -0.0889*** | -0.0202*** | -0.106*** |
| | (0.00489) | (0.00522) | (0.0114) | (0.00221) | (0.000555) | (0.00921) |
| Obs. | 27 | 27 | 27 | 817 | 2040 | 817 |
| R-squared | 0.161 | 0.345 | 0.020 | 0.665 | 0.394 | 0.140 |
| **Colombia** | 2001/03-2017/19 | 2001/03-2008/10 | 2011-19 | | | 2011-19 |
| Log $Y_0$ | -0.0238*** | -0.0376*** | -0.0244*** | | | -0.0319*** |
| | (0.00589) | (0.0113) | (0.00694) | | | (0.00187) |
| Obs. | 24 | 24 | 33 | | | 1122 |
| R-squared | 0.425 | 0.335 | 0.286 | | | 0.206 |
| **Peru** | 2000/03-2017/19 | 2000/03-2008/10 | 2008/10-2017/19 | 2000/03-2017/19 | 2000/03-2008/10 | 2008/10-2017/19 |
| Log $Y_0$ | -0.0195*** | -0.0224*** | -0.0240*** | -0.0296*** | -0.0308*** | -0.0473*** |
| | (0.00370) | (0.00768) | (0.00646) | (0.00168) | (0.00392) | (0.00338) |
| Obs. | 24 | 24 | 24 | 186 | 186 | 186 |
| R-squared | 0.558 | 0.278 | 0.384 | 0.627 | 0.252 | 0.516 |
| **Ecuador** | 2003/04-2017/19 | 2003/04-2009/11 | 2009/11-2017/19 | 2003/04-2017/19 | 2003/04-2009/11 | 2009/11-2017/19 |
| Log $Y_0$ | -0.0428*** | -0.0556*** | -0.0423** | -0.0464*** | -0.0638*** | -0.0660*** |
| | (0.00737) | (0.00992) | (0.0184) | (0.00332) | (0.00549) | (0.00799) |
| Obs. | 21 | 21 | 21 | 191 | 191 | 191 |
| R-squared | 0.639 | 0.623 | 0.217 | 0.508 | 0.417 | 0.266 |
| **Chile** | 2000/03-2015/17 | 2000/03-2009/11 | 2009/11-2015/17 | 2000/03-2015/17 | 2000/03-2009/11 | 2009/11-2015/17 |
| Log $Y_0$ | -0.0111* | -0.0150 | -0.0148 | -0.0207*** | -0.0276*** | -0.0385*** |
| | (0.00590) | (0.0116) | (0.0109) | (0.00155) | (0.00259) | (0.00505) |
| Obs. | 13 | 13 | 13 | 299 | 299 | 299 |
| R-squared | 0.243 | 0.132 | 0.142 | 0.375 | 0.278 | 0.164 |

**Table 5. Absolute convergence in real per capita household labor income at different administrative levels by country and period (contd.)**

| | Annual per capita growth | | | | | |
|---|---|---|---|---|---|---|
| | Admininistrative level 1 | | | Administrative level 2 | | |
| **Dominican Republic** | 2000/02-2014/16 | 2000/02-2008/10 | 2008/10-2014/16 | 2000/02-2014/16 | 2000/02-2008/10 | 2008/10-2014/16 |
| Log $Y_0$ | -0.0293*** | -0.0313*** | -0.0370*** | -0.0430*** | -0.0647*** | -0.0721*** |
| | (0.00601) | (0.00962) | (0.0115) | (0.00395) | (0.00603) | (0.0132) |
| Obs. | 30 | 30 | 30 | 115 | 115 | 115 |
| R-squared | 0.459 | 0.274 | 0.269 | 0.511 | 0.505 | 0.210 |
| **Honduras** | 2004/06-2017/19 | 2004/06-2009/11 | 2009/11-2017/19 | 2004/06-2017/19 | 2004/06-2009/11 | 2009/11-2017/19 |
| Log $Y_0$ | -0.0191** | -0.0328 | -0.0408* | -0.0439*** | -0.0834*** | -0.0872*** |
| | (0.00803) | (0.0193) | (0.0207) | (0.00368) | (0.00776) | (0.00751) |
| Obs. | 16 | 16 | 16 | 243 | 243 | 243 |
| R-squared | 0.287 | 0.171 | 0.216 | 0.372 | 0.324 | 0.359 |
| **Costa Rica** | | 2001/03-2008/09 | | | 2001/03-2008/09 | |
| Log $Y_0$ | | -0.00613 | | | -0.0242*** | |
| | | (0.0130) | | | (0.00642) | |
| Obs. | | 7 | | | 79 | |
| R-squared | | 0.043 | | | 0.155 | |
| **Argentina** | 2003/05-2017/19 | 2003/05-2009/11 | 2009/11-2017/19 | | | |
| Log $Y_0$ | -0.0181*** | -0.0102 | -0.0397*** | | | |
| | (0.00465) | (0.0108) | (0.00965) | | | |
| Obs. | 29 | 29 | 29 | | | |
| R-squared | 0.358 | 0.032 | 0.385 | | | |
| **Uruguay** | 2000/02-2017/19 | 2000/02-2008/10 | 2008/10-2017/19 | | | |
| Log $Y_0$ | -0.0177** | -0.0448*** | -0.00714 | | | |
| | (0.00733) | (0.0130) | (0.0175) | | | |
| Obs. | 19 | 19 | 19 | | | |
| R-squared | 0.255 | 0.410 | 0.010 | | | |
| **Bolivia** | 2001/02-2017/19 | 2001/02-2011/13 | 2011/13-2017/19 | | | |
| Log $Y_0$ | -0.0360*** | -0.0421*** | -0.0590*** | | | |
| | (0.00500) | (0.0119) | (0.0139) | | | |
| Obs. | 9 | 9 | 9 | | | |
| R-squared | 0.881 | 0.641 | 0.719 | | | |
| **Panama** | 2001/03-2017/19 | 2001/03-2009/11 | 2009/11-2017/19 | | | |
| Log $Y_0$ | -0.0117** | -0.0131 | -0.0218 | | | |
| | (0.00395) | (0.00780) | (0.0151) | | | |
| Obs. | 12 | 12 | 12 | | | |
| R-squared | 0.465 | 0.220 | 0.173 | | | |

**Table 6. Absolute convergence in location premiums after sorting at different administrative levels by country and time period**

| | Annual location premium growth (after sorting) | | | | | |
|---|---|---|---|---|---|---|
| | Administrative level 1 | | | Administrative level 2 | | |
| **Mexico** | 1990-15 | 2000-10 | 2000-15 | 1990-15 | 2000-10 | 2000-15 |
| $\gamma_0^{as}$ | -0.0145*** | -0.0275*** | -0.0265*** | -0.0263*** | -0.0330*** | -0.0278*** |
| | (0.00384) | (0.00626) | (0.00540) | (0.000372) | (0.00109) | (0.000687) |
| Obs. | 32 | 32 | 32 | 2301 | 2,330 | 2,320 |
| R-squared | 0.323 | 0.392 | 0.445 | 0.686 | 0.283 | 0.413 |
| **Brazil** | 2002/04-2014/15 | 2000-10 | 2009/11-2014/15 | 2002/04-2014/15 | 2000-10 | 2009/11-2014/15 |
| $\gamma_0^{as}$ | -0.0178*** | -0.0101 | -0.0207* | -0.0942*** | -0.0142*** | -0.129*** |
| | (0.00548) | (0.00661) | (0.0120) | (0.00213) | (0.000657) | (0.0117) |
| Obs. | 27 | 27 | 27 | 817 | 2,040 | 817 |
| R-squared | 0.295 | 0.086 | 0.106 | 0.706 | 0.186 | 0.129 |
| **Colombia** | 2001/03-2017/19 | 2001/03-2008/10 | 2008/10-2017/19 | | | |
| $\gamma_0^{as}$ | -0.0443*** | -0.0775*** | -0.0385*** | | | |
| | (0.00888) | (0.0217) | (0.0112) | | | |
| Obs. | 24 | 24 | 24 | | | |
| R-squared | 0.531 | 0.367 | 0.351 | | | |
| **Peru** | 2000/03-2017/19 | 2000/03-2008/10 | 2008/10-2017/19 | 2000/03-2017/19 | 2000/03-2008/10 | 2008/10-2017/19 |
| $\gamma_0^{as}$ | -0.0186*** | -0.0122 | -0.0286*** | -0.0268*** | -0.0357*** | -0.0317*** |
| | (0.00639) | (0.0124) | (0.00818) | (0.00208) | (0.00427) | (0.00362) |
| Obs. | 24 | 24 | 24 | 186 | 186 | 186 |
| R-squared | 0.278 | 0.042 | 0.356 | 0.474 | 0.275 | 0.294 |
| **Ecuador** | 2003/04-2017/19 | 2003/04-2009/11 | 2009/11-2017/19 | 2003/04-2017/19 | 2003/04-2009/11 | 2009/11-2017/19 |
| $\gamma_0^{as}$ | -0.0496*** | -0.0504*** | -0.0695*** | -0.0504*** | -0.0617*** | -0.0809*** |
| | (0.0100) | (0.0162) | (0.0221) | (0.00309) | (0.00632) | (0.00677) |
| Obs. | 21 | 21 | 21 | 191 | 191 | 191 |
| R-squared | 0.562 | 0.339 | 0.342 | 0.584 | 0.336 | 0.431 |
| **Chile** | 2000/03-2015/17 | 2000/03-2009/11 | 2009/11-2015/17 | 2000/03-2015/17 | 2000/03-2009/11 | 2009/11-2015/17 |
| $\gamma_0^{as}$ | -0.0195*** | -0.0138* | -0.0424*** | -0.0173*** | -0.0178*** | -0.0371*** |
| | (0.00397) | (0.00747) | (0.0133) | (0.00162) | (0.00251) | (0.00458) |
| Obs. | 13 | 13 | 13 | 299 | 299 | 299 |
| R-squared | 0.687 | 0.236 | 0.481 | 0.278 | 0.145 | 0.181 |
| **Dominican Republic** | 2000/02-2014/16 | 2000/02-2008/10 | 2008/10-2014/16 | 2000/02-2014/16 | 2000/02-2008/10 | 2008/10-2014/16 |
| | -0.0239*** | -0.0250** | -0.0214 | -0.0413*** | -0.0609*** | -0.0713*** |
| | (0.00742) | (0.00979) | (0.0132) | (0.00396) | (0.00676) | (0.0113) |
| Obs. | 30 | 30 | 30 | 115 | 115 | 115 |
| R-squared | 0.270 | 0.190 | 0.085 | 0.491 | 0.418 | 0.260 |

**Table 6. Absolute convergence in location premiums after sorting at different administrative levels by country and time period (contd.)**

| | Annual location premium growth (after sorting) | | | | | |
|---|---|---|---|---|---|---|
| | Administrative level 1 | | | Administrative level 2 | | |
| **Honduras** | 2004/06-2017/19 | 2004/06-2009/11 | 2009/11-2017/19 | 2004/06-2017/19 | 2004/06-2009/11 | 2009/11-2017/19 |
| | -0.0253** | -0.0326* | -0.0307* | -0.0413*** | -0.0669*** | -0.0694*** |
| | (0.00944) | (0.0181) | (0.0165) | (0.00364) | (0.00656) | (0.00760) |
| Obs. | 16 | 16 | 16 | 243 | 243 | 243 |
| R-squared | 0.338 | 0.188 | 0.199 | 0.349 | 0.301 | 0.257 |
| **Costa Rica** | | 2001/03-2008/09 | | | 2001/03-2008/09 | |
| | | -0.00782 | | | -0.0307*** | |
| | | (0.0215) | | | (0.00753) | |
| Obs. | | 7 | | | 79 | |
| R-squared | | 0.026 | | | 0.177 | |
| **Argentina** | 2003/05-2017/19 | 2003/05-2009/11 | 2009/11-2017/19 | | | |
| | -0.0125** | -0.00396 | -0.0379*** | | | |
| | (0.00598) | (0.00994) | (0.0135) | | | |
| Obs. | 29 | 29 | 29 | | | |
| R-squared | 0.139 | 0.006 | 0.226 | | | |
| **Uruguay** | 2000/02-2017/19 | 2000/02-2008/10 | 2008/10-2017/19 | | | |
| | -0.0206*** | -0.0416*** | -0.00549 | | | |
| | (0.00658) | (0.0110) | (0.0138) | | | |
| Obs. | 19 | 19 | 19 | | | |
| R-squared | 0.364 | 0.457 | 0.009 | | | |
| **Bolivia** | 2001/02-2017/19 | 2001/02-2011/13 | 2011/13-2017/19 | | | |
| | -0.0327*** | -0.0280** | -0.0704*** | | | |
| | (0.00423) | (0.0103) | (0.0142) | | | |
| Obs. | 9 | 9 | 9 | | | |
| R-squared | 0.895 | 0.516 | 0.779 | | | |
| **Panama** | 2001/03-2017/19 | 2001/03-2009/11 | 2009/11-2017/19 | | | |
| | -0.0190 | 0.00568 | -0.0515* | | | |
| | (0.0133) | (0.0123) | (0.0265) | | | |
| Obs. | 12 | 12 | 12 | | | |
| R-squared | 0.168 | 0.021 | 0.274 | | | |

Note: $\gamma_0^{as}$ refers to the initial location premium after sorting, estimated with regression model (2). For Mexico the analysis is based on census data for all periods while in Brazil this is the case for period 2000-2010. For the rest of the countries the analysis is based on SEDLAC harmonized household surveys.

**Table 7. Absolute convergence in location premia before and after sorting by municipality type**

| | Metro large | Metro small | Urban large | Urban small | Rural large | Rural small |
|---|---|---|---|---|---|---|
| **Panel A. Mexico** | | | | | | |
| | Annual location premium growth 2000-15 (before sorting) | | | | | |
| $\gamma_0^{bs}$ | -0.0464*** | -0.0313*** | -0.0215*** | -0.0197*** | -0.0170*** | -0.0284*** |
| | (0.00531) | (0.00412) | (0.00151) | (0.00137) | (0.00157) | (0.00127) |
| Obs. | 41 | 72 | 357 | 437 | 586 | 827 |
| $R^2$ | 0.663 | 0.451 | 0.362 | 0.322 | 0.166 | 0.378 |
| | Annual location premium growth 2000-15 (after sorting) | | | | | |
| $\gamma_0^{as}$ | -0.0476*** | -0.0354*** | -0.0254*** | -0.0253*** | -0.0203*** | -0.0311*** |
| | (0.00384) | (0.00375) | (0.00165) | (0.00143) | (0.00154) | (0.00123) |
| Obs. | 41 | 72 | 357 | 437 | 586 | 827 |
| $R^2$ | 0.798 | 0.560 | 0.399 | 0.417 | 0.229 | 0.437 |
| **Panel B. Brazil** | | | | | | |
| | Annual location premium growth 2000-10 (before sorting) | | | | | |
| $\gamma_0^{bs}$ | -0.0110*** | -0.0110*** | -0.0120*** | -0.00951*** | -0.00920*** | -0.00325 |
| | (0.00352) | (0.00153) | (0.000962) | (0.000824) | (0.00194) | (0.00239) |
| Obs. | 46 | 176 | 434 | 842 | 317 | 225 |
| $R^2$ | 0.181 | 0.229 | 0.264 | 0.137 | 0.067 | 0.008 |
| | Annual location premium growth 2000-10 (after sorting) | | | | | |
| $\gamma_0^{as}$ | -0.0110** | -0.00809*** | -0.0151*** | -0.0152*** | -0.0227*** | -0.0178*** |
| | (0.00533) | (0.00222) | (0.00137) | (0.00111) | (0.00224) | (0.00272) |
| Obs. | 46 | 176 | 434 | 842 | 317 | 225 |
| $R^2$ | 0.088 | 0.071 | 0.219 | 0.183 | 0.246 | 0.162 |
| | Urban-Metro | | Urban large | Urban small | Rural Large | Rural small |
| **Panel C. Colombia** | | | | | | |
| | Annual location premium growth 2011-19 (before sorting) | | | | | |
| $\gamma_0^{bs}$ | -0.0175** | | -0.0305*** | -0.0341*** | -0.0228*** | -0.0463*** |
| | (0.00698) | | (0.00408) | (0.00529) | (0.00294) | (0.00371) |
| Obs. | 59 | | 168 | 150 | 341 | 404 |
| $R^2$ | 0.099 | | 0.252 | 0.220 | 0.151 | 0.279 |

| | **Urban** | **Rural** | | **Urban** | **Rural** |
|---|---|---|---|---|---|
| **Panel D. Peru** | | | | | |
| | Annual location premium growth 2000/03-2017/19 (before sorting) | | | Annual location premium growth 2000/03-2017/19 (after sorting) | |
| $\gamma_0^{bs}$ | -0.0158*** | -0.0329*** | $\gamma_0^{as}$ | -0.0196*** | -0.0394*** |
| | (0.00273) | (0.00303) | | (0.00311) | (0.00304) |
| Obs. | 71 | 115 | | 71 | 115 |
| $R^2$ | 0.326 | 0.510 | | 0.366 | 0.597 |
| **Panel E. Ecuador** | | | | | |
| | Annual location premium growth 2003/04-2017/19 (before sorting) | | | Annual location premium growth 2003/04-2017/19 (after sorting) | |
| $\gamma_0^{bs}$ | -0.0467*** | -0.0448*** | $\gamma_0^{as}$ | -0.0501*** | -0.0541*** |
| | (0.00513) | (0.00444) | | (0.00489) | (0.00404) |
| Obs. | 69 | 122 | | 69 | 122 |
| $R^2$ | 0.553 | 0.495 | | 0.610 | 0.599 |

**Table 7. Absolute convergence in location premia before and after sorting by municipality type (contd.)**

| | Urban | Rural | | Urban | Rural |
|---|---|---|---|---|---|
| **Panel F. Chile** | | | | | |
| | Annual location premium growth 2000/03-2015/17 (before sorting) | | | Annual location premium growth 2000/03-2015/17 (after sorting) | |
| $\gamma_0^{bs}$ | -0.0172*** | -0.0260*** | $\gamma_0^{as}$ | -0.0140*** | -0.0215*** |
| | (0.00144) | (0.00238) | | (0.00202) | (0.00282) |
| Obs. | 201 | 98 | | 201 | 98 |
| $R^2$ | 0.418 | 0.553 | | 0.193 | 0.378 |
| **Panel G. Dominican Republic** | | | | | |
| | Annual location premium growth 2000/02-2014/16 (before sorting) | | | Annual location premium growth 2000/02-2014/16 (after sorting) | |
| $\gamma_0^{bs}$ | -0.0317*** | -0.0434*** | $\gamma_0^{as}$ | -0.0349*** | -0.0451*** |
| | (0.00499) | (0.00646) | | (0.00564) | (0.00553) |
| Obs. | 51 | 64 | | 51 | 64 |
| $R^2$ | 0.452 | 0.421 | | 0.438 | 0.517 |
| **Panel I. Honduras** | | | | | |
| | Annual location premium growth 2004/06-2017/19 (before sorting) | | | Annual location premium growth 2004/06-2017/19 (after sorting) | |
| $\gamma_0^{bs}$ | -0.0400*** | -0.0341*** | $\gamma_0^{as}$ | -0.0556*** | -0.0421*** |
| | (0.00963) | (0.00370) | | (0.0106) | (0.00387) |
| Obs. | 33 | 210 | | 33 | 210 |
| $R^2$ | 0.357 | 0.291 | | 0.470 | 0.363 |
| **Panel J. Costa Rica** | | | | | |
| | Annual location premium growth 2001/03-2008/09 (before sorting) | | | Annual location premium growth 2001/03-2008/09 (after sorting) | |
| $\gamma_0^{bs}$ | -0.00904 | -0.0245*** | $\gamma_0^{as}$ | -0.0421*** | -0.0218** |
| | (0.0107) | (0.00886) | | (0.0129) | (0.0102) |
| Obs. | 30 | 49 | | 30 | 49 |
| $R^2$ | 0.025 | 0.140 | | 0.276 | 0.088 |

Source: D'Aoust, Galdo, and Ianchovichina (2022). Note: The results are estimated based on model (2.3). $\gamma_0^{bs}$ refers to the initial location premium before sorting. These are the estimated location premiums without controlling for household characteristics but are net of survey-year fixed effects as in model (2.2). $\gamma_0^{as}$ refers to the initial location premium after sorting, estimated with model (2.1). These are the estimated location premiums controlling for sorting based on household characteristics (age, age squared, gender, human capital, marital status, household demographics, and employment characteristics) and are also net of survey-year fixed effects. In the case of Mexico, the analysis is based on census data for all periods. In the case of Brazil, census data is used for the period 2000-2010, while household data is used in all other periods. In the case of Colombia, we use official aggregates of value-added data and only include one category for metropolitan municipalities. For the rest of the countries, the analysis is based on SEDLAC harmonized household surveys.

Convergence occurred at different speeds across different types of localities (Table 7). In Mexico, convergence was fastest across metropolitan municipalities and slowest across large rural municipalities. In Brazil, convergence in labor productivity premia (i.e. location premia *before* sorting) was fastest across the large urban and metropolitan municipalities, while convergence in place

productivity premia (i.e. location premia *after* sorting) was fastest across rural areas, especially larger ones. In Chile, Colombia, Dominican Republic, and Peru, convergence was faster across rural municipalities. By contrast, in Honduras and Costa Rica, it was faster across urban municipalities. Location premia converged at similar rates across rural and urban areas in Ecuador (Table 7). Thus, in Mexico, Honduras, and Costa Rica, convergence was mainly driven by the urbanization process, while in Brazil, Colombia, Chile, Dominican Republic, and Peru, the commodity boom rather than the urbanization process was behind it. In Ecuador, both forces appear to have played an important role. Convergence reflected both improvements in growth in lagging municipalities and to different extents the slowdown in growth in previously high productivity municipalities. In almost all countries the fastest-growing municipalities were rural, although growth was much more dispersed across rural than urban ones, indicating that some rural areas continued to lag behind.

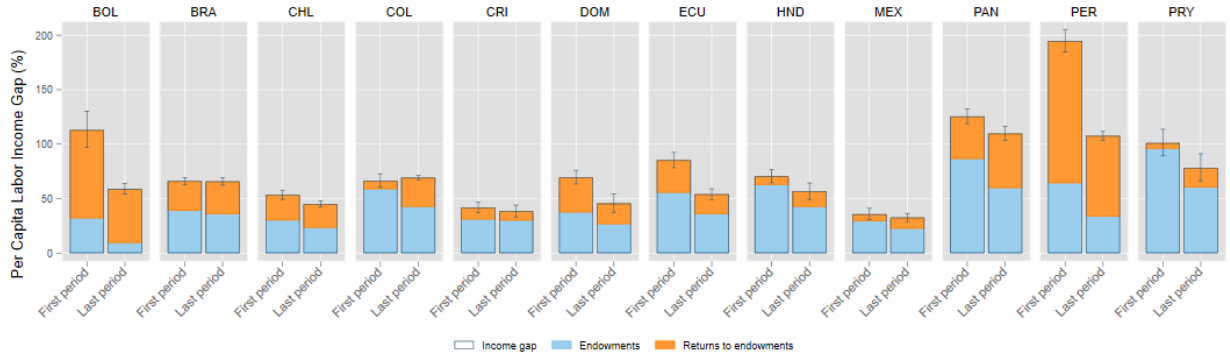
*4.4 Income gaps with leading metropolitan areas*

The incomes gaps with the leading Latin American metropolitan areas, identified in (6), were high in many LAC countries in the early 2000s (Figure 4). In Peru, the average per capita household labor income in Lima was almost three times the corresponding income in other parts of the country. Convergence narrowed down to different degrees the income gaps with the leading areas between the early 2000s and the late 2010s (Figure 4). Still, on the eve of the Covid-19 pandemic, sizable differences in per capita household labor earnings with the leading areas were observed in all countries, except in Mexico and Costa Rica. The gaps remained particularly high in Peru, Panama, and Paraguay. In most cases, except Brazil, Colombia, Honduras, Mexico, and Panama, the gaps exploitable through migration, i.e. those that can be attributed to differences in returns to endowments and captured by the second component on the right-hand-side of (6), also declined by the end of the 2010s (Figure 4).[19]

As suggested by consistency check (7), we find that in all countries the difference between the place productivity premium (i.e. the location premium after sorting) in the leading area and the median place productivity premium approximately equals the rate-of-return component in the income gap decomposition, shown in Figure 4. The correlation between the right-hand side and left-hand side of (7) is high for the sample of countries included in the paper. It is 0.78 in the first period and 0.73 in the second period. At the country level, differences between the right-hand side and left-hand side of (7) are expected to be larger when the survey years in the location premia estimiation and the income gap analysis are not fully aligned, some municipalities are omitted from the estimation of the location premia after sorting due to missing information on household characteristics, and the households are not evenly distributed across municipalities. For example, if the share of households living in municipalities with below median premia locations is higher than those located in above median premia localities, then the right-hand side of (7) is expected to be higher than its left-hand side. This is the situation in Bolivia, where 62% of all households lived in locations with below median location premia in the last period (see Appendix Figure A1). The opposite is observed in Honduras, where 59% of all households lived in locations with above median location premia (Appendix Figure A1).

[19] This is consistent with the increase in the difference between the location premium in the leading areas ($\gamma^*$) and the median premium ($\gamma_{l50}$) in Colombia, Honduras, and Panama in Table 8. In the cases of Brazil and Mexico, the periods shown in Table 8 do not align with the periods shown for the two countries in Figure 4, because the table reflects information from the IPUMS census data, while the figure shows data from the SEDLAC household surveys.

**Figure 4. The average income gap with the leading area and its decomposition by country**




Note: *The income gap is decomposed into an endowment component, capturing differences between the non-geographic household characteristics, such as education, demographics, and employment, in the leading and other areas, and a returns-to-endowments component, capturing differences between the returns to these characteristics in the leading and other areas. **To ensure comparability within and across countries, the per capita household labor earnings are deflated to adjust incomes for cost-of-living differences across space and time.***Results are shown as geometric means of income, i.e. the logarithmic differences shown in Appendix Table A9 is used to compute the exponential difference: $\exp(\ln(x) - \ln(y))-1 = x/y -1$. ****Leading area, first and last period in each country shown in the figure are, respectively, the City of Buenos Aires, 2003-05, 2017-19 in Argentina; Belo Horizonte, Sao Paulo, and Rio de Janeiro, 2012-14, 2017-19 in Brazil; Santiago, 2000 and 2003, 2015 and 2017 in Chile; Bogotá, 2001-03, 2017-19 in Colombia; urban Central Valley region (includes San Jose and other main cities), 2001-03, 2008-09 in Costa Rica; City of Santo Domingo, 2000-02, 2014-16 in Dominican Republic; Quito (Urban Pichincha), 2003-04, 2017-19 in Ecuador; urban Tegucigalpa (Francisco Morazan), 2004-06, 2017-19 in Honduras; Mexico City metropolitan area, 2000, 2002, and 2004, 2016 and 2018 in Mexico; urban Panama province, 2001-03, 2017-19 in Panama; Ascunsion, 2002-04, 2017-19 in Paraguay; Lima, 2000-03, 20175-19 in Peru; Montevideo, 2000-02, 2017-19 in Uruguay.

In most countries, differences in education explained the majority of the average income gaps with the leading agglomerations at the end of the 2010s (Table 9). This is consistent with the fact that the leading areas in the region attract the educated and highly skilled workers (Ferreyra and Roberts, 2018), while differences in household demographics and employment type play a small role. Only in Bolivia and Peru, the income gaps with leading areas could be attributed mostly to differences in returns to endowments (Figure 4). The large exploitable income gaps in these two countries suggest that the typical household might be able to benefit from migration to the leading agglomeration. In Brazil, Chile, and Panama, both differences in endowments and returns to these endowments contribute to the income gaps.

**Table 8. Dispersion in the location premia after sorting around the mean/median/leading location premium**

| **Mexico** | 1990 | 2000 | 2015 | **Honduras** | 2004/06 | 2009/11 | 2017/19 |
|---|---|---|---|---|---|---|---|
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 14.668 | 10.488 | 7.615 | $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 9.195 | 7.835 | 8.380 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 13.558 | 9.750 | 7.142 | $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 8.561 | 7.349 | 7.899 |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.349 | 0.333 | 0.308 | $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.306 | 0.286 | 0.256 |
| $\gamma^* - \gamma_{l50}$ | 0.207 | 0.294 | 0.226 | $\gamma^* - \gamma_{l50}$ | 0.232 | 0.259 | 0.252 |
| **Brazil** | 2000 | 2010 | | **Costa Rica** | 2001/03 | 2008/09 | |
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 8.971 | 7.685 | | $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 3.869 | 3.241 | |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 8.241 | 7.137 | | $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 3.685 | 3.138 | |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.390 | 0.359 | | $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.252 | 0.185 | |
| $\gamma^* - \gamma_{l50}$ | 0.318 | 0.280 | | $\gamma^* - \gamma_{l50}$ | 0.227 | 0.177 | |
| **Peru** | 2000/03 | 2008/10 | 2017/19 | **Colombia** 1/ | 2001/03 | 2008/10 | 2017/19 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 11.244 | 9.063 | 6.985 | $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 3.433 | 3.127 | 2.346 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 9.371 | 7.899 | 6.207 | $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 3.360 | 2.948 | 2.241 |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.665 | 0.527 | 0.489 | $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.092 | 0.270 | 0.221 |
| $\gamma^* - \gamma_{l50}$ | 0.650 | 0.522 | 0.513 | $\gamma^* - \gamma_{l50}$ | 0.055 | 0.314 | 0.227 |
| **Ecuador** | 2003/04 | 2009/11 | 2017/19 | **Argentina** 1/ | 2003/05 | 2009/11 | 2017/19 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 7.087 | 5.625 | 4.474 | $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 5.298 | 4.587 | 4.069 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 6.359 | 5.269 | 4.237 | $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 4.811 | 4.312 | 3.915 |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.441 | 0.282 | 0.241 | $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.397 | 0.305 | 0.190 |
| $\gamma^* - \gamma_{l50}$ | 0.406 | 0.263 | 0.221 | $\gamma^* - \gamma_{l50}$ | 0.472 | 0.357 | 0.217 |
| **Chile** | 2000/03 | 2009/11 | 2015/17 | **Uruguay** 1/ | 2000/02 | 2008/10 | 2017/19 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 5.303 | 4.327 | 3.780 | $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 3.668 | 2.834 | 2.783 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 5.052 | 4.202 | 3.671 | $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 3.402 | 2.736 | 2.664 |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.223 | 0.153 | 0.160 | $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.351 | 0.153 | 0.210 |
| $\gamma^* - \gamma_{l50}$ | 0.219 | 0.157 | 0.178 | $\gamma^* - \gamma_{l50}$ | 0.389 | 0.129 | 0.186 |
| **Dominican Republic** | 2000/02 | 2008/10 | 2014/16 | **Bolivia** 1/ | 2001/02 | 2011/13 | 2017/19 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 5.543 | 4.531 | 4.237 | $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 9.256 | 5.869 | 3.585 |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 5.145 | 4.287 | 4.048 | $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 8.743 | 5.597 | 3.429 |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.380 | 0.280 | 0.226 | $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.245 | 0.237 | 0.226 |
| $\gamma^* - \gamma_{l50}$ | 0.351 | 0.246 | 0.175 | $\gamma^* - \gamma_{l50}$ | 0.336 | 0.205 | 0.246 |
| **Panama** 1/ | 2001/03 | 2009/11 | 2017/19 | | | | |
| $\%\mathrm{CV}(\gamma_l)\vert_{\overline{\gamma_l}}$ | 6.614 | 7.076 | 5.865 | | | | |
| $\%\mathrm{CV}(\gamma_l)\vert_{\gamma^*}$ | 6.272 | 6.513 | 5.538 | | | | |
| $\mathrm{Avg.}\,(\gamma^* - \gamma_l)$ | 0.222 | 0.371 | 0.272 | | | | |
| $\gamma^* - \gamma_{l50}$ | 0.152 | 0.301 | 0.203 | | | | |

Notes: 1/Analysis conducted at the first administrative level. Location premium (after sorting) of leading areas correspond to the first administrative-level unit where the leading location is located. The location premia of the multi-municipality leading areas in Brazil, Chile, Mexico, and Peru are the average location premiums of the municipalities included in the leading area. $\%\mathrm{CV}\,(\gamma_l)\vert_{\overline{\gamma_l}}$ and $\%\mathrm{CV}\,(\gamma_l)\vert_{\gamma^*}$ measures the coefficient of variation around the mean and the location premium in the leading area, respectively. $\mathrm{Avg.}\;(\gamma^* - \gamma_l)$ measures the average gap in location premium of leading area $(\gamma^*)$ and each one of the other locations $(\gamma_l)$. $(\gamma^* - \gamma_{l50})$ measures the gap between the location premium in the leading area and the median.

**Table 9. Income gaps and the contribution of endowment differences at the end of the 2010s**

| Country | Per capita labor income (US$ PPP) | | Income gap | Potential increase in income if equal endowments | Of which: | | |
|---|---|---|---|---|---|---|---|
| | Leading Area | Rest of Country | | | education | employment | demographics |
| Argentina | 596.6 | 341.8 | 75% | 43% | 67% | 4% | 30% |
| Bolivia | 336.4 | 211.5 | 59% | 8% | 64% | 40% | *-4%* |
| Brazil | 306.2 | 184.7 | 66% | 32% | 88% | -2% | 14% |
| Chile | 552.8 | 381.0 | 45% | 21% | 96% | 3% | *1%* |
| Colombia | 392.3 | 231.7 | 69% | 38% | 64% | 11% | 25% |
| Costa Rica | 455.4 | 328.9 | 38% | 29% | 81% | *1%* | 18% |
| Dominican Republic | 371.3 | 255.0 | 46% | 25% | 96% | *4%* | *0%* |
| Ecuador | 316.4 | 205.4 | 54% | 33% | 55% | 10% | 36% |
| Honduras | 233.6 | 149.1 | 57% | 40% | 77% | *3%* | 20% |
| Mexico | 212.4 | 160.1 | 33% | 22% | 65% | *-1%* | 36% |
| Panama | 608.4 | 290.2 | 110% | 50% | 59% | 18% | 23% |
| Paraguay | 532.1 | 298.3 | 78% | 56% | 66% | 15% | 19% |
| Peru | 354.2 | 170.6 | 108% | 26% | 67% | 12% | 21% |
| Uruguay | 589.7 | 388.5 | 52% | 30% | 79% | 7% | 13% |

Notes: Results are shown as geometric means of income, i.e. the logarithmic differences shown in Appendix Table A9 is used to compute the exponential difference: exp(ln(x) − ln(y ))-1 = x/y -1. Results in italics are not significant. Only urban households included in the Argentina's and Uruguay's samples. The last period in most countries is 2017-19, except in Chile, 2015, 2017; Costa Rica, 2008-09; Dominican Republic, 2014-16 and Mexico, 2016, 2018. The leading areas are the City of Buenos Aires in Argentina; Belo Horizonte, Sao Paulo, and Rio de Janeiro in Brazil; Santiago in Chile; Bogotá in Colombia; San Jose in Costa Rica; City of Santo Domingo in Dominican Republic; Quito (Urban Pichincha) in Ecuador; urban Tegucigalpa (Francisco Morazan) in Honduras; Mexico City metropolitan area in Mexico; urban Panama province in Panama; Ascunsion in Paraguay; Lima-Callao region in Peru; Montevideo in Uruguay.

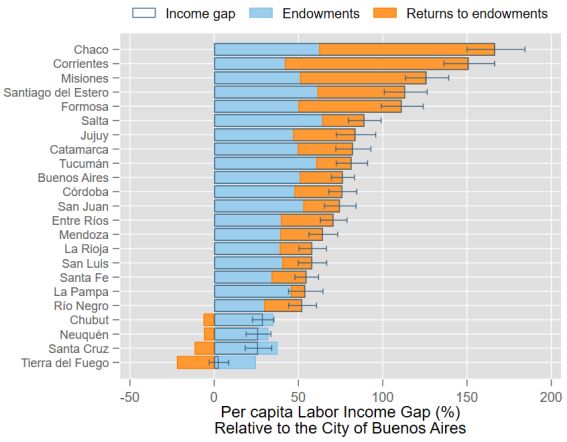
### 4.4.1 Income gaps with leading areas by administrative region

In the largest countries, the income gaps with the leading area by 1st level administrative region, which depending on the country could be state, province, or department, considerably vary in size (Figure 5). They are largest for the residents of some of the poorest and often remote regions. Importantly, within countries, the variation in income gaps across states and provinces mostly reflects variation in the differences in returns to endowments, rather than variation in the endowment differences with the leading metropolitan areas (Figure 5), signaling that barriers to migration tend to grow with distance, as shown by Skoufias and Lopez-Acevedo (2009) and Bryan and Morten (2018).

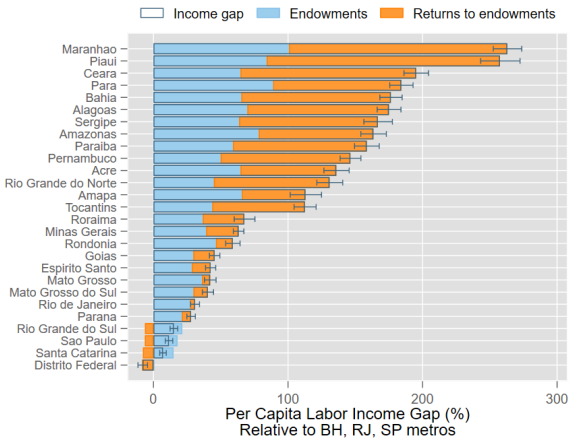
Distance matters because the cost of travel rises with the distance traveled by migrants. Travel costs tend to be high in the large Latin American countries where traveling by air is the only way to get to many parts of these countries. The migrants' social capital also tends to decline with distance. The strength of the migrant networks, which provide potential migrants with information, job opportunities, and even housing upon arrival in the destination city, tends to diminish with distance from the location of the migrant. Support through social networks is particularly important for the poorest residents, who have limited budgets and information through other sources. In addition, location preferences and discrimination may also serve as barriers to migration. Afro-descendants and indigenous workers in Brazil's North and Northeast are significantly less likely to migrate out of their states than white residents, regardless of their level of education (Figure 6).

**Figure 5. Income gaps by administrative region in the largest Latin American economies**

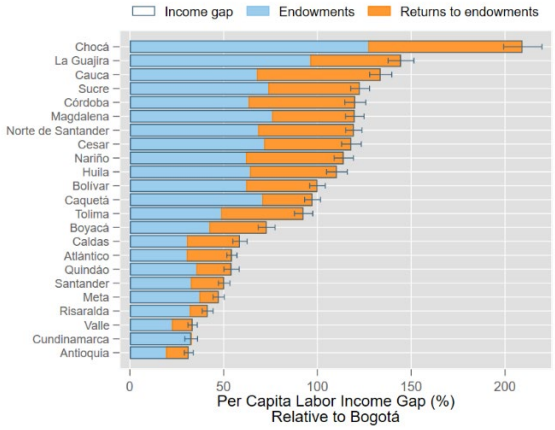
**Panel a. Argentina**



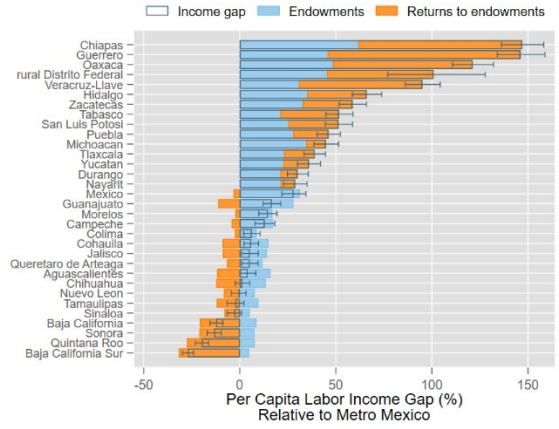

**Panel b. Brazil**



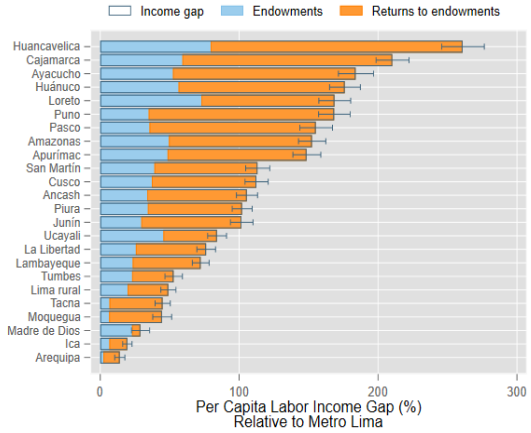

**Panel c. Colombia**




**Panel d. Mexico**

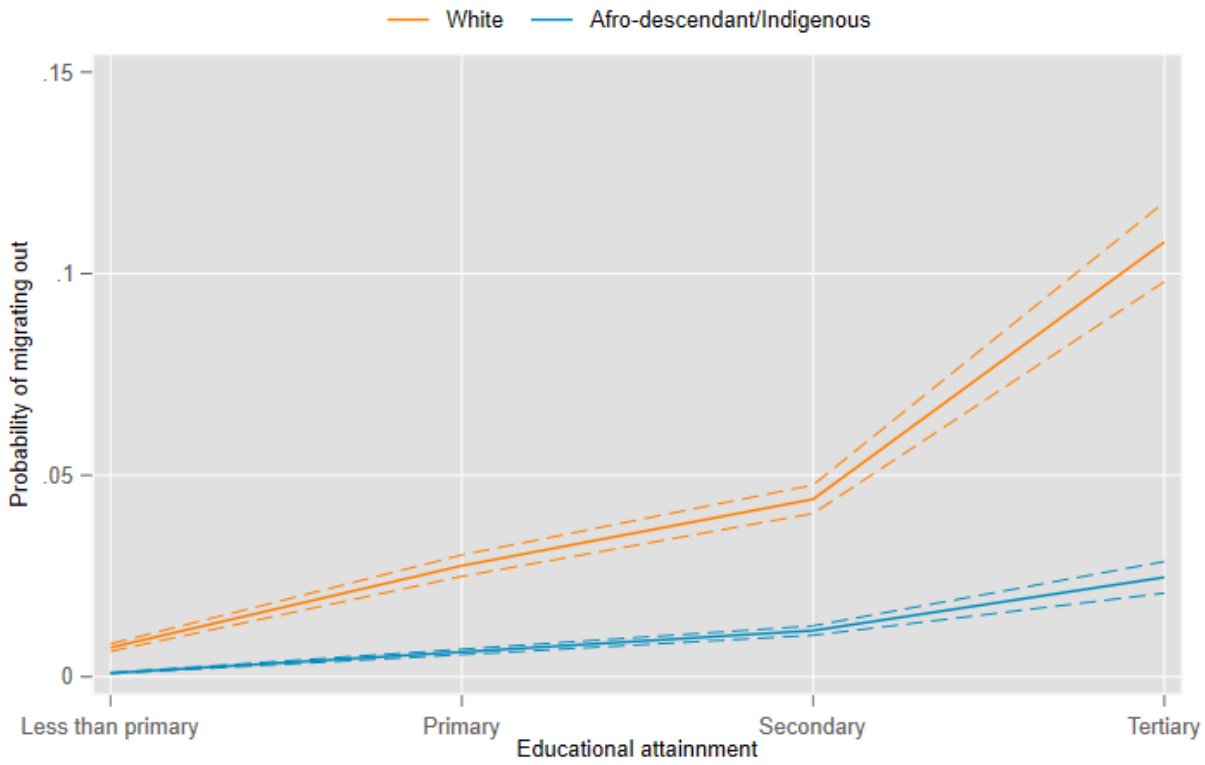



**Panel e. Peru**




Note: Results are shown as geometric means of income, i.e. the logarithmic differences shown in Appendix Table A9 is used to compute the exponential difference: $\exp(\ln(x) - \ln(y))-1 = x/y - 1$.

**Figure 6. Probability of migrating out of the Brazil's most lagging states (adults)**




Note: Lagging states are the ones with an income gap of at least 50 percent: Rondonia, Acre, Amazonas, Roraima, Para, Amapa, Tocantins, Maranhao, Piaui, Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe, Bahia and Minas Gerais.

### 4.4.2 Income gaps with leading areas by socioeconomic group

The income gaps among urban residents (Figure 7, Panel A) are generally smaller than the average income gaps among all households in each LAC country (Figure 4), in line with the smaller differences in endowments, especially education, among urban workers in the leading and secondary cities than between the leading area and the rest of the country, including rural areas. In Argentina, Brazil, Ecuador, Paraguay, and Uruguay, the urban income gaps mostly reflect endowment deficits, particularly education, while in Chile, Colombia, Panama, and Peru, they mostly reflect differences in the returns to endowments, and therefore potentially greater welfare gains for urbanites willing to migrate to the leading urban areas in this latter group of countries. In Bolivia, Costa Rica, Honduras, and Mexico, the urban income gaps are smallest and below 25 percent.

The income gaps among the skilled households[20] are mostly comparable, and in a couple of cases smaller, than those among urban households (Figure 7, Panels A and B). In the countries with small urban gaps, such as Bolivia, Costa Rica, Ecuador, Honduras, and Mexico, the skilled income gaps are also low (around or below 25 percent). In Argentina and Uruguay, the skilled income gaps are smaller than the urban income gaps. The relatively large skilled income gaps (around 50 percent) in Brazil,

[20] The skilled households are those in which the household head has at least some tertiary education and households in which the highest educational attainment is beyond secondary education.

Chile, Colombia, Dominican Republic, Panama, and Peru can be attributed mainly to differences in returns to endowments, possibly reflecting barriers to migration due to shortages of affordable formal housing in these countries' leading cities.[21] Only in Paraguay, the skilled income gaps can be attributed to differences in the endowments of the skilled households in the leading area and the rest of the country.

The rural income gaps with leading areas (Figure 7, Panel C) are much larger than the average (Figure 4) and the urban income gaps (Figure 7, Panels A). In most countries, these gaps can be primarily explained with deficits in portable endowments, especially education. Only in Bolivia and Peru, the gaps mainly reflect differences in returns to endowments rather than differences in portable household characteristics. In Brazil, the gaps are large and can be explained both by differences in endowments and differences in the returns to these endowments. Consequently, only in these three countries, there is still some scope for lifting incomes through rural-urban migration.

In most countries, the income gaps with the leading areas are insignificant or very small among the bottom 40% (B40) of households (Figure 7, Panel D). The gaps are negligible in Argentina, Chile, Costa Rica, Dominican Republic, and Uruguay and close to or below 25% in Colombia, Ecuador, Honduras, Mexico, and Paraguay. Only in Bolivia, Brazil, Panama, and Peru, the income gaps among the B40 are around 50% and can be explained mostly with differences in returns to endowments, not differences in endowments, indicating potential benefits from migration to the leading areas.

4.4.3 Income gaps with leading areas by gender

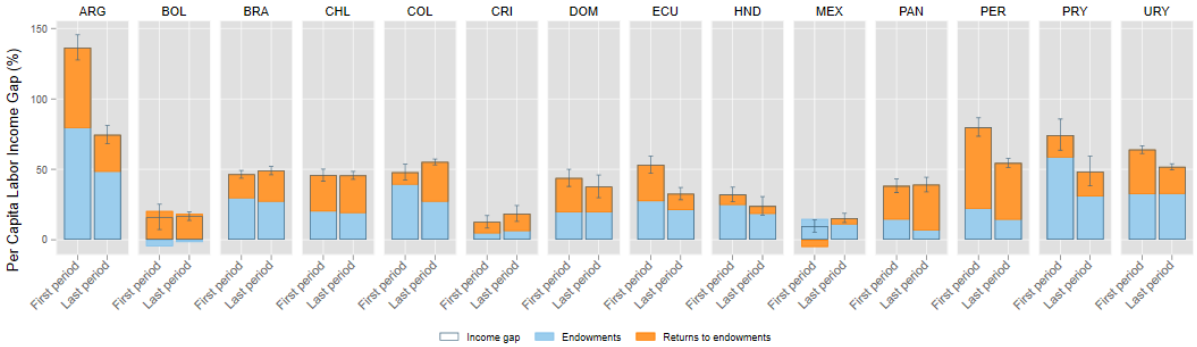
One way to explore whether there are systematic differences in the income gaps with the leading areas between men and women is to estimate regression models (4) and (5) at the individual level for men and women, estimate (6) by gender, and compare the female and male income gaps in each country.[22] The results suggest that the differences between the male and female urban income gaps were relatively muted in the early 2000s (Figure 8, Panel A), except in Brazil, Mexico, and Uruguay. By the end of the 2010s, female urban income gaps widened in Bolivia, Colombia, Ecuador, Peru, and Paraguay, but only in Colombia, they deteriorated relative to the early 2000s.

The growing gender disparities in the income gaps with the leading areas cannot be explained with growing gender disparities among the skilled workers (Figure 8, Panel B). Among the B40, female income gaps became significantly larger than male income gaps only in Colombia, Mexico, and Uruguay (Figure 8, Panel D). In Colombia and Mexico, where we have information on individuals residing in rural areas, this development can be attributed to the increase in the female rural income gaps with the leading area. Female rural income gaps also opened in Paraguay and grew in Ecuador, Panama, and Peru. These results are consistent with evidence from the migration literature, which documents no change in the preferences of young migrants for large cities (Rodríguez and Busso 2009; Rowe, 2013), but a shift in the sex and education composition of domestic migrants to leading areas towards migrants who are male and educated (Rodríguez, 2004).

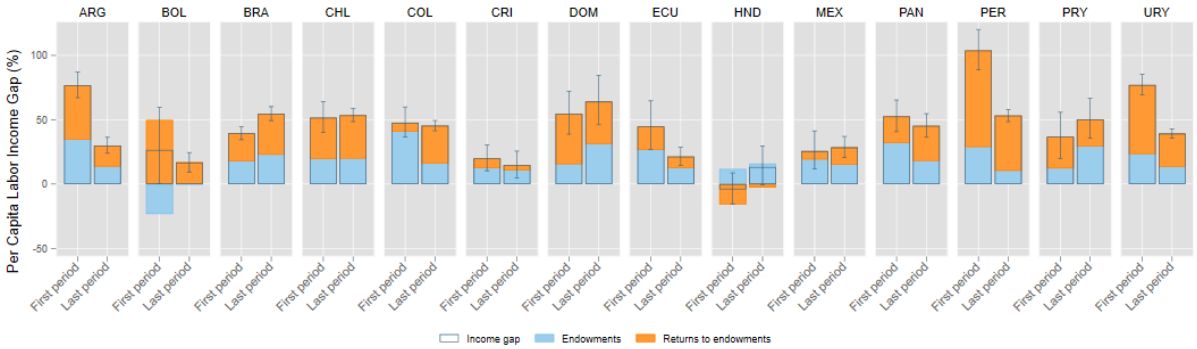
[21] See Bastos (2017), who shows that in Brazil the deficit in formal housing has been growing, and potentially deterring skilled workers who might be more reluctant than unskilled workers to live in poor quality informal housing.
[22] While the SEDLAC data are representative only at the household level, it is possible to conduct the analysis at the individual level for the purpose of comparing the income gaps by gender.

**Figure 7. Decomposition of income by socioeconomic group and country**

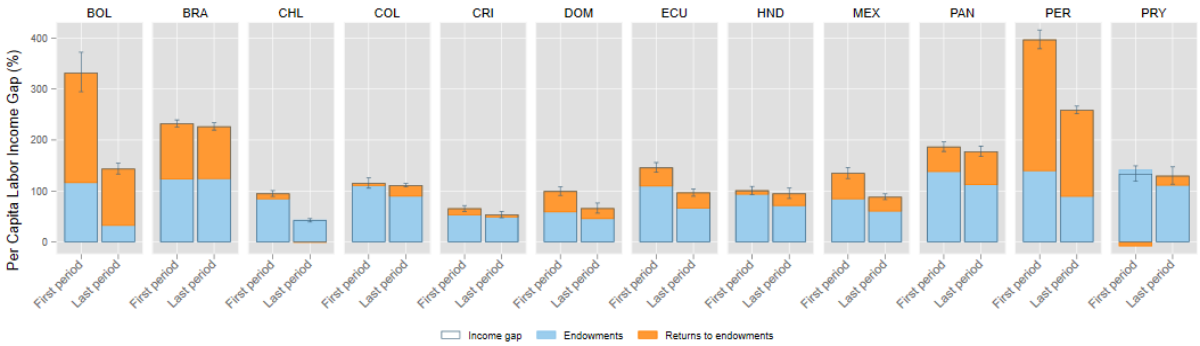
**Panel A. Urban households**



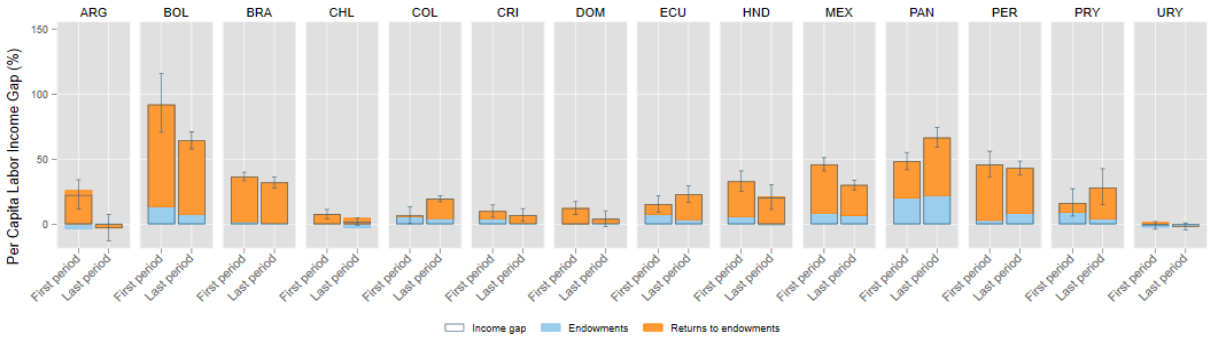

**Panel B. Skilled households**




**Panel C. Rural households**



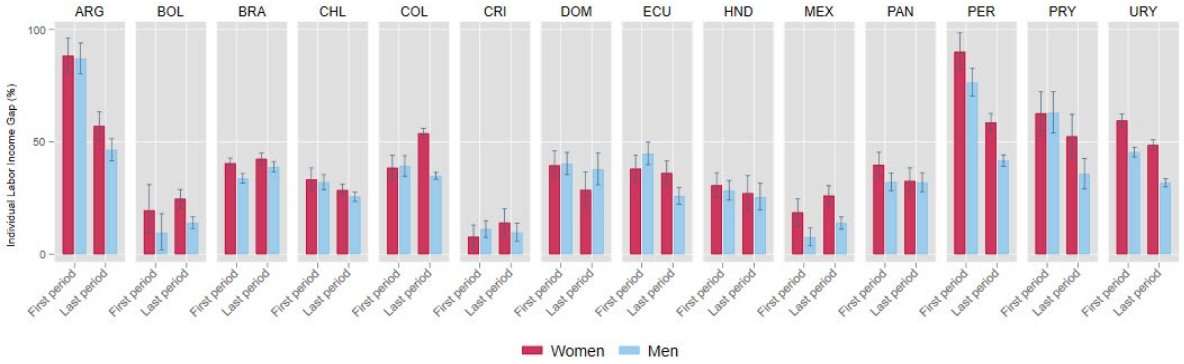

**Panel D. The B40 households**



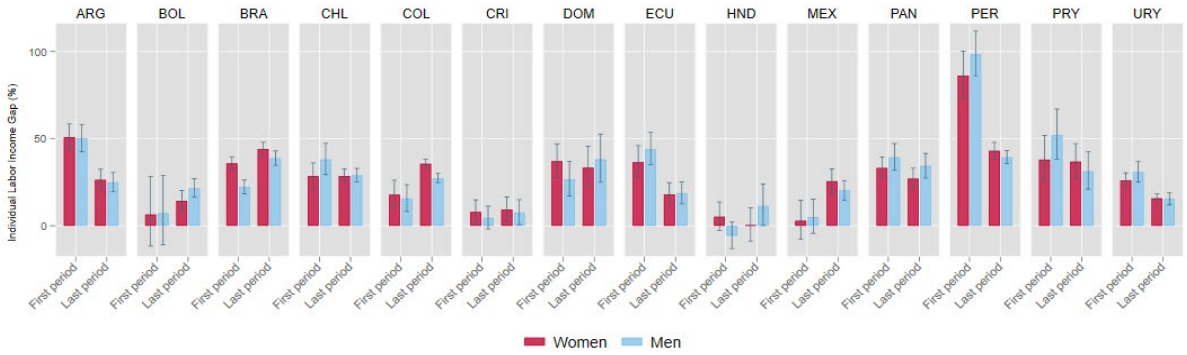

Note: Results are shown as geometric means of income, i.e. the logarithmic differences shown in Appendix Table A9 is used to compute the exponential difference: $\exp(\ln(x) - \ln(y))-1 = x/y - 1$.

**Figure 8. The evolution of the income gap with the leading area by gender and country**

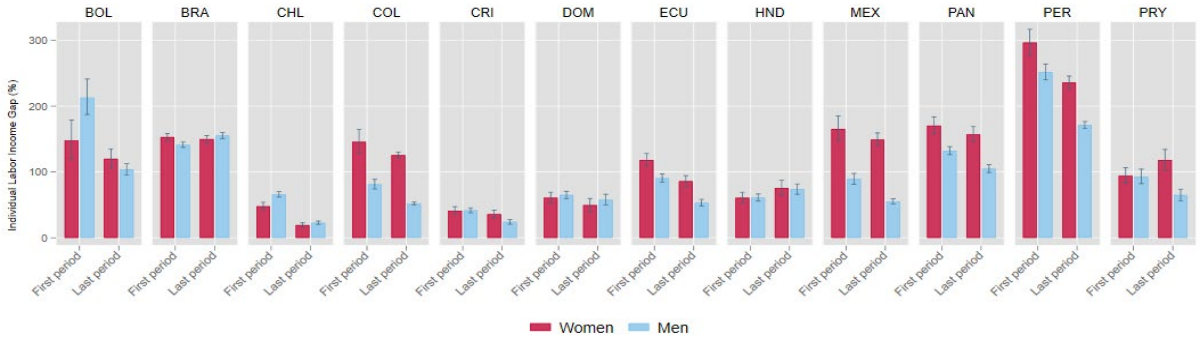
**Panel A. Urban individuals**



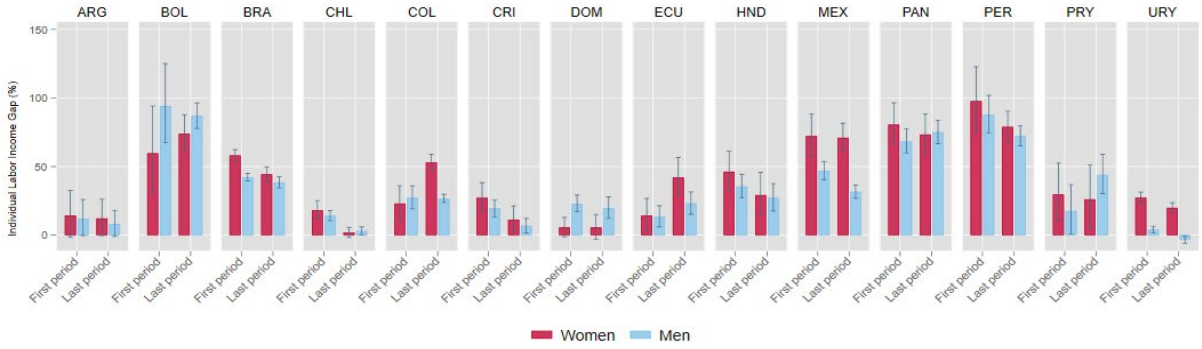

**Panel B. Skilled individuals**




**Panel C. Rural individuals**




**Panel D. Bottom 40 percent**




Note: Results are shown as geometric means of income, i.e. the logarithmic differences shown in Appendix Table A9 is used to compute the exponential difference: $\exp(\ln(x) - \ln(y))-1 = x/y - 1$.

## 5. Concluding remarks

Between the early 2000s and the late 2010s, most Latin American countries experienced significant reductions in regional inequality as real labor incomes and local productivity premia converged at the 1st and 2nd administrative levels. The decline in regional inequality reflected the expansion of agribusiness and mining, which brought investments to lagging, predominantly rural areas, and to different extents, the slowdown in productivity growth in large urban municipalities, which occurred as de-industrialization shifted urban employment toward less dynamic, low-productivity non-tradables (Jedwab et al., 2022).

Convergence diminished the income gaps with leading metropolitan areas in most countries. At the end of the 2010s, income disparities with leading metropolitan areas remained high in nearly all countries largely due to differences in educational attainment, but in a few countries large differences in returns to endowments indicate potentially significant returns to migration to the leading metropolitan areas, especially for residents of relatively poor, remote regions. Rather than a clear rural-urban-metropolitan divide, in most countries the paper documents substantial overlap between the location-premia distributions of different types of second-level administrative areas and small differences between the average urban and rural place productivity premia.

The estimated differences in returns to portable endowments in the leading and other areas capture the static effects of any barriers to migration. However, the differences in returns may also reflect differences due to measurement errors in the non-geographic characteristics, which may bias the estimated differences in returns and therefore affect the interpretation of the results for policy purposes. For example, since the quality of education in lagging regions or secondary cities is likely lower than the quality of education in the leading cities, the returns to education in the lagging region or secondary city may appear lower than the returns to education in the leading areas, although the returns to the quality-adjusted years of education may be the same. Hence, future work should focus on refining the treatment of portable endowments, especially education, and ways to capture currently unobservable portable characteristics.

Other promising directions for future research include analyses of the barriers to migration and their relative importance for different socioeconomic groups. While migration to leading areas may enable workers to capture a significant share of the income gaps in some countries, it may not be a solution for everybody due to preferences and cultural factors. Hence, the influence of different regional policies and institutions on local productivity premia, including those that boost the growth of secondary cities, merits further attention in the Latin American context.

## References


Acemoglu, D., Bautista, M. A., Querubín, P. and Robinson, J. A. (2007) "Economic and Political Inequality in Development: The Case of Cundinamarca, Colombia." National Bureau of Economic Research Working Paper 13208.

Acemoglu, D. and Dell, M. (2010) "Productivity Differences between and within Countries," *American Economic Journal: Macroeconomics* 2:1: 169-188.

Acosta, P., Calderon, C., Fajnzylber, P., and Lopez, H. (2008) "What is the Impact of International Remittances on Poverty and Inequality in Latin America?" *World Development* 36(1): 89-114.

Adão, R. (2015) "Worker heterogeneity, wage inequality, and international trade: Theory and evidence from Brazil," unpublished manuscript.

Alesina, A. and Perotti, R. (1996) "Income distribution, political instability, and investment," *European Economic Review* 40: 1203-28.

Aroca, P., Bosch, M., Maloney, W. (2005) "Spatial Dimensions of Trade Liberalization and Economic Convergence: Mexico 1985–2002," *The World Bank Economic Review* 19 (3): 345–78.

Azzoni, C. (2001) "Economic growth and regional income inequality in Brazil," *The Annals of Regional Science* 35: 133-152.

Beylis, G., Fattal-Jaef, R., Sinha, R., Morris, M., and Sebastian, A. (2020) *Going Viral: Govid-19 and the Accelerated Transformation of Jobs in Latin America and the Caribbean*, World Bank Latin American and Caribbean Studies, Washington, DC: World Bank.

Bryan, G. and Morten, M. (2019) "The Aggregative Productivity Effects of Internal Migration: evidence from Indonesia," *Journal of Political Economy* 127(5): 2229-68.

Burger, M., Hendriks, M., Ianchovichina, E. (2022) "Happy but Unequal: Differences in Subjective Well-Being across Individuals and Space in Colombia," *Applied Research in Quality of Life* 17(3): 1343-87.

Bosch, M., Aroca, P., Fernandez, I. J., and Azzoni, C. R. (2003) "Growth dynamics and space in Brazil," *International Regional Science Review* 26 (3): 393–418.

Chiquiar, D. (2005) "Why Mexico's Regional Income Convergence Broke Down," *Journal of Development Economics* 77: 257-275.

Costa, F., Garred, J., and Pessoa, J. P. (2016) "Winners and losers from a commodities-for-manufactures trade boom," *Journal of International Economics* 102: 50-69.

Davalos, M., Esquivel, G., López-Calva, L.F., Rodríguez-Castelán, C. (2015) "Convergence with Stagnation: Mexico's Growth at the Municipal Level 1990-2010," Working Paper No. 2015-001, Sobre Mexico.

De La Roca, J. and Puga, D. (2017) "Learning by Working in Big Cities," *Review of Economic Studies* 84: 106-142.

Dell, M. (2010) "The Persistent Effects of Peru's Mining Mita," *Econometrica* 78(6): 1863-1903.

Diamond, R. (2016) "The Determinants and Welfare Implications of US Workers' Diverging Location Choices by Skill: 1980-2000," *American Economic Review* 106(3): 479-524.

Dix-Carneiro, R. and Kovak, B. (2017) "Trade Liberalization and Regional Dynamics," *American Economic Review* 107(10): 2908-46.

Dix-Carneiro, R. and Kovak, B. (2019) "Margins of Labor Market Adjustment to Trade," *Journal of International Economics* 117: 125-142.Dorling, D. and Tomlinson, S. (2019) *Rule Britannia: Brexit and the End of Empire*. London: Biteback Publishing.

Duranton, G. and Puga, D. (2020) "The Economics of Urban Density," *Journal of Economic Perspectives* 34(3): 3-26.

Elbers, C., Lanjouw, P., Mistiaen, J., Özler, B., and Simler, K. (2004) "On the Unequal Inequality of Poor Communities," *World Bank Economic Review* 18(3): 401-421.

Escobal, J. and Ponce, C. (2011) "Access to public infrastructure, institutional thickness and pro-poor growth in rural Peru," *Journal of International Development* 23(3): 358–79.

Escobal, J. and Ponce, C. (2016) "Dinámicas provinciales de pobreza en el Perú, 1993–2007." In F. Modrego Benito & J. A. Berdegué (Eds.), *Los Dilemas Territoriales del Desarrollo en América Latina*. Bogotá, Colombia: Ediciones Uniandes.

Faber, B. and Gaubert, C. (2019) "Tourism and Economic Development: Evidence from Mexico's Coastline," *American Economic Review* 109(6): 2245-93.

Favareto, A. and Abramovay, R. (2016) "Contrastes territoriales de los indicadores de ingreso, pobreza monetaria y desigualdad en el Brasil de los años noventa." In F. Modrego Benito & J. A. Berdegué (Eds.), *Los Dilemas Territoriales del Desarrollo en América Latina*. Bogotá, Colombia: Ediciones Uniandes.

Fernández, M., Hernández, C., Ibáñez, A. M., and Jaramillo, C. (2016) "Dinámicas provinciales de pobreza en Colombia 1993–2005." In F. Modrego Benito & J. A. Berdegué (Eds.), *Los Dilemas Territoriales del Desarrollo en América Latina*. Bogotá, Colombia: Ediciones Uniandes.

Ferreyra, M. M. and Roberts, M. (eds.) (2018) Raising the Bar for Productive Cities in Latin America and the Caribbean, Washington, DC: World Bank.

Galvis, L. A. and Meisel Roca, A. (2010) "Persistencia de las desigualdades regionales en Colombia: Un análisis especial," Documento de Trabajo Sobre Economı´a Regional No. 120. Banco de la República, Colombia.

Glaeser, E., Kolko, J., and Saiz, A. (2001) "Consumer City" *Journal of Economic Geography* 1(1): 27-50.

González Rivas, M. (2007) "The effects of Trade Openness on Regional Inequality in Mexico," *The Annals of Regional Science* 41: 545–561.

Grover, A., Lall, S. and Maloney, W. (2022) *Place, Productivity, and Prosperity: Revisiting Spatially Targeted Policies for Regional Development*, Washington, DC: World Bank.

Grover, A., Lall, S., & Maloney, W. (2022) Place, Productivity, and Prosperity: Revisiting Spatially Targeted Policies for Regional Development. World Bank Publications.

Iacovone, L., Sanchez-Bayardo, L., and Sharma, S. (2015) "Regional Productivity Convergence in Peru," Policy Research Working Paper No. 7499, Washington DC: The World Bank.

Ianchovichina, E. (2018) *Eruptions of Popular Anger: The Economics of the Arab Spring and Its Aftermath*, World Bank Publications – Books, Washington DC: World Bank.

Jedwab, R., Ianchovichina, E., and Haslop, F. (2022) "Consumption Cities versus Production Cities: New Considerations and Evidence," Policy Research Working Paper No. 10105, Washington, DC: World Bank.

Kanbur, R. and Rapapori, H. (2005) "Migration selectivity and the evolution of spatial inequality," *Journal of Economic Geography* 5: 43-57.

Kovak, B. (2013) "Regional Effects of Trade Reform: What is the Correct Measure of Liberalization?" *American Economic Review* 103: 1960-76.Larrea, C., Landín, R., Larrea, A. I., Wrborich, W. & Fraga, R. (2016) "Mapas de pobreza, consumo per cápita y desigualdad social en Ecuador: 1995–2006," In F. Modrego Benito & J. A. Berdegué (Eds.), *Los Dilemas Territoriales del Desarrollo en América Latina*. Bogotá, Colombia: Ediciones Uniandes.

Li, Y. and Rama, M. (2015) "Households or Locations? Cities, Catchment Areas and Prosperity in India," Policy Research Working Paper No. 7473, Washington DC: World Bank.

López-Calva, L., Ortiz-Juarez, E., Rodriguez-Castelan, C. (2021) "Within-country poverty convergence: evidence from Mexico," *Empirical Economics* 62: 2547-86.Mesquita Moreira, M., Blyde, J., Volpe, C., and Molina, D. (2013) *Too Far to Export: Domestic Transport Costs and Regional Export Disparities in Latin America and the Caribbean*. Washington DC: Inter-American Development Bank.

Modrego, F. and Berdegué, J. (2016) "Large-Scale Mapping of Territorial Development Dynamics in Latin America," *World Development* 73: 11-31.

Modrego, F., Ramírez, E., Tartakowsky, A., & Jara, E. (2016) "La heterogeneidad territorial del desarrollo en la década de oro de la economía chilena," In F. Modrego Benito & J. A. Berdegué (Eds.), *Los Dilemas Territoriales del Desarrollo en América Latina*. Bogotá, Colombia: Ediciones Uniandes.

Naritomi, J., Soares, R., and Assunção, J. (2007) "Rent Seeking and the Unveiling of 'De Facto' Institutions: Development and Colonial Heritage within Brazil." National Bureau of Economic Research Working Paper 13545.

Oaxaca, R. (1973) "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review* 14(3): 693-709.

Olfert, R., Partdridge, M., Berdegué, J., Escobal, J., Jara, B., & Modrego, F. (2014) "Places for place-based policies," *Development Policy Review* 32(1): 5–32.

Ponczek, V. and Ulyssea, G. (2022) "Enforcement of Labour Regulation and Labor Market Effects of Trade: Evidence from Brazil," *The Economic Journal* 132 (641): 361-390.

Rodríguez-Pose, A. (2017) "The Revenge of the Places that Don't Matter (and What To Do about It)," *Cambridge Journal of Regions, Economy and Society* 11 (1): 189-209.

Rodríguez -Pose, A. and Sánchez-Reaza, J. (2002) "The impact of trade liberalization on regional disparities in Mexico," *Growth and Change* 33: 72– 90.

Rodríguez, J. (2004) *Internal Migration in Latin America and the Caribbean: Regional Study, Period 1980–2000*. Serie Población y Desarrollo, No. 50 (LC/L.2059–P), Santiago: CEPAL.

Rodríguez, J. and Busso, G. (2009) *Internal Migration and Development in Latin America between 1980 and 2005. A Comparative Study with a Regional Focus based on Seven Countries*. Santiago: CEPAL, (LC/G.2397–P).

Rodríguez, J. (2011) "Migración Interna y Sistema de Ciudades en América Latina: Intensidad, Patrones, Efectos y Potenciales Determinantes, Censos de la Década de 2000 [Internal Migration and the Latin American System of Cities: Intensity," Patterns, Impacts and Potential Determinants, 2000 Census round]. Serie Población y Desarrollo N° 105, (LC/L.3351), Santiago: CEPAL.

Romero, W. and Zapil Ajxup, P. (2009) "Dinámica territorial del consume, la pobreza y la desigualdad en Guatemala, 1998-2006," Programa Dinámicas Territoriales Rurales. Rimisp, Santiago, Chile.

Rowe, F. (2013) *Spatial Labour Mobility in a Transition Economy: Migration and Commuting in Chile*. Ph.D. thesis, University of Queensland.

Rowe, F. (2014) "The Effects of Economic Liberalisation on Inter-Regional Labour Migration in a Transition Economy," Chile. Conference paper, 2014 Tinbergen Workshop: real people in virtual space, Amsterdam, The Netherlands.

Serra, M. I., Pazmino, M. F., Lindow, G., Sutton, B., and Ramirez, G. (2006) "Regional Convergence in Latin America," IMF Working Paper WP/06/125, May, Washington DC: IMF.

Skoufias, E. and Lopez-Acevedo, G. (2009) *Determinants of Regional Welfare Disparities Within Latin American Countries*, Vol 1: Synthesis, Washington DC: World Bank.

Soto, R. and Torche, A. (2004) "Spatial Inequality, Migration, and Economic Growth in Chile," *Latin American Journal of Economics* 41: 401–24.

Sotelo, S. (2020) "Domestic Trade Frictions and Agriculture," Journal of Political Economy 128(7): 2690-738.

Quintero, L. and Roberts, M. (2018) "Explaining Spatial Variations in Productivity: Evidence from Latin America and the Caribbean," Policy Research World Paper No. 8560, Washington, DC: World Bank.

Venables, A. (2017) "Breaking into Tradables: Urban Form and Urban Function in a Developing City," *Journal of Urban Economics* 98 (C), 88–97.

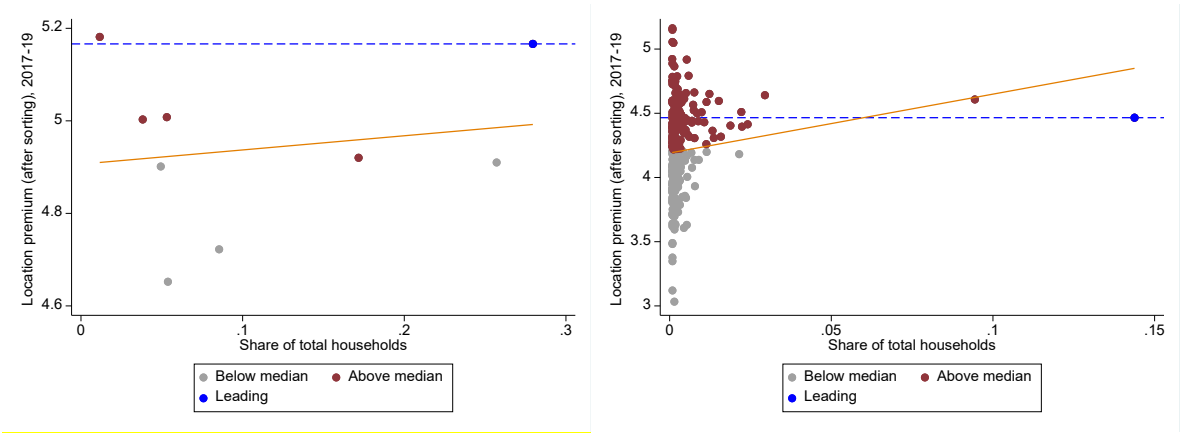
World Bank (2020) *Convergence: Five Critical Steps toward Integrating Lagging and Leading Areas in the Middle East and North Africa*, Washington, DC: World Bank.

Yúnez Naude, A., Arellano González, J., and Méndez Navarro, J. (2016) "Dinámica del consumo, pobreza y desigualdad municipal en México: 1990–2005," In F. Modrego Benito & J. A. Berdegué (Eds.), *Los Dilemas Territoriales del Desarrollo en América Latina*. Bogotá, Colombia: Ediciones Uniandes.

# Appendix

**Appendix Figure A1. Share of total households and location premium after sorting in 2017-19**

**Bolivia** **Honduras**




**Appendix Table A1. Variables for portable household characteristics grouped by type of endowment**

| Type of endowment | Indicator |
|---|---|
| Demographics | Gender<br>Age, age squared<br>Household size<br>Number of household members aged less than 2, between 3 and 11, between 12 and 17, between 18 and 59, above 59. All squared value were also included. |
| Education | Less than completed primary education<br>Less than completed secondary education<br>Less than completed tertiary education<br>Complete tertiary degree<br>Highest attainment in the household |
| Employment | Employer<br>Salaried worker<br>Self-employed<br>Not salaried<br>Unemployed |

## Appendix Table A2. Data Sources for the Territorial Productivity Dynamics Analysis

| Country | Source | Lowest Admin. Level | Years |
|---|---|---|---|
| Mexico | Census - IPUMS | Municipality | 1990, 2000, 2010 and 2015 |
| Brazil | Census - IPUMS | Municipality | 2000, 2010 |
| | SEDLAC- WB | Municipality | 2002, 2003, 2004, 2009, 2011, 2014, 2015 |
| Colombia | VA- DANE | Municipality | 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 |
| | SEDLAC- WB | Departamento | 2001, 2002, 2003, 2008, 2009, 2010, 2017, 2018, 2019 |
| Peru | SEDLAC-WB | Province | 2000, 2001, 2002, 2003, 2008, 2009, 2010, 2017, 2018, 2019 |
| Ecuador | SEDLAC-WB | Canton | 2003, 2004, 2009, 2010, 2011, 2017, 2018, 2019 |
| Chile | SEDLAC-WB | Comuna | 2000, 2003, 2009, 2011, 2015, 2017 |
| Dominican Republic | SEDLAC-WB | Municipality | 2000, 2001, 2002, 2008, 2009, 2010, 2014, 2015, 2016 |
| Honduras | SEDLAC-WB | Municipality | 2004, 2005, 2006, 2009, 2010, 2011, 2017, 2018, 2019 |
| Costa Rica | SEDLAC-WB | Canton | 2001, 2002, 2003, 2008, 2009 |
| Argentina | SEDLAC-WB | Urb. Aggl. | 2003, 2004, 2005, 2009, 2010, 2011, 2017, 2018, 2019 |
| Uruguay | SEDLAC-WB | Departamento | 2000, 2001, 2002, 2008, 2009, 2010, 2017, 2018, 2019 |
| Bolivia | SEDLAC-WB | Departamento | 2001, 2002, 2011, 2012, 2013, 2017, 2018, 2019 |
| Panama | SEDLAC-WB | Province | 2001, 2002, 2003, 2009, 2010, 2011, 2017, 2018, 2019 |

Note: In Argentina, there are urban agglomerations in each province and more than one in some provinces (Buenos Aires). Rio Negro is the only privnce for which we do not have data in the convergence analysis because the urban agglomerations in this province were included only in recent surveys.

## Appendix Table A3. Data sources for spatially differentiated price deflators by country

| Country | Spatial deflators |
|---|---|
| Argentina | SEDLAC urban poverty lines for 6 regions – Buenos Aires Province, Pampeana, Cuyo, North East, Patagónia, North West – by year. |
| Brazil | IBGE State GDP Deflators and poverty lines for the metro, urban and rural areas within each state by year. |
| Bolivia | SEDLAC poverty lines for each of the 9 departments by urban and rural area and year. |
| Chile | CEPAL poverty lines by year and area of residence |
| Colombia | DANE spatial deflators at the level of the country's departments by year. An additional correction was made to account for differences across urban and rural areas based on CEPAL poverty lines. |
| Costa Rica | CEPAL poverty lines by year and area of residence |
| Dominican Republic | CEPAL poverty lines used until 2016; SEDLAC from 2017 onwards. |
| Ecuador | CEPAL poverty lines by urban and rural areas and year. |
| Honduras | SEDLAC poverty lines by year and area of residence |
| Mexico | INEGI State GDP deflators & poverty lines for urban & rural areas within each state |
| Panama | CEPAL poverty lines by year and area of residence |
| Paraguay | SEDLAC poverty lines by year and area of residence |
| Peru | INEI spatial deflators at the level of the country's departments by year, including for differences between urban and rural areas. |
| Uruguay | Only urban areas included, and no spatial adjustments applied. |

**Appendix Table A4. Descriptive statistics**

| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
|---|---|---|---|---|---|---|
| Argentina | 2003-05 | | 2009-11 | | 2017-19 | |
| log per capita income, 2011 PPP | 5.50 | 1.10 | 5.96 | 0.98 | 5.91 | 0.98 |
| HH head, less than complete primary education | 0.11 | 0.31 | 0.08 | 0.28 | 0.06 | 0.24 |
| HH head, less than complete secondary education | 0.44 | 0.50 | 0.39 | 0.49 | 0.35 | 0.48 |
| HH head, less than complete tertiary education | 0.29 | 0.45 | 0.33 | 0.47 | 0.36 | 0.48 |
| HH head, complete tertiary education | 0.16 | 0.37 | 0.19 | 0.39 | 0.23 | 0.42 |
| HH max, less than complete primary education | 0.02 | 0.15 | 0.02 | 0.12 | 0.01 | 0.10 |
| HH max, less than complete secondary education | 0.30 | 0.46 | 0.25 | 0.43 | 0.19 | 0.39 |
| HH max, less than complete tertiary education | 0.41 | 0.49 | 0.43 | 0.50 | 0.47 | 0.50 |
| HH max, complete tertiary education | 0.26 | 0.44 | 0.30 | 0.46 | 0.33 | 0.47 |
| HH head age | 46.74 | 14.14 | 47.12 | 14.33 | 48.32 | 14.44 |
| HH head male | 0.75 | 0.43 | 0.69 | 0.46 | 0.62 | 0.49 |
| HH head married | 0.69 | 0.46 | 0.66 | 0.47 | 0.63 | 0.48 |
| HH size | 3.66 | 1.85 | 3.52 | 1.80 | 3.36 | 1.76 |
| Household members aged 0 to 2 | 0.19 | 0.44 | 0.17 | 0.42 | 0.14 | 0.38 |
| Household members aged 3 to 11 | 0.58 | 0.91 | 0.53 | 0.83 | 0.50 | 0.81 |
| Household members aged 12 to 17 | 0.41 | 0.73 | 0.38 | 0.71 | 0.33 | 0.62 |
| Household members aged 18 to 59 | 2.15 | 1.16 | 2.10 | 1.14 | 2.02 | 1.16 |
| Household members aged 60+ | 0.33 | 0.63 | 0.34 | 0.63 | 0.38 | 0.67 |
| HH head self-employed | 0.26 | 0.44 | 0.23 | 0.42 | 0.23 | 0.42 |
| HH head wage earner | 0.59 | 0.49 | 0.60 | 0.49 | 0.57 | 0.49 |
| HH head unpaid worker | 0.00 | 0.04 | 0.00 | 0.03 | 0.00 | 0.03 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Bolivia | 2001-02 | | 2011-13 | | 2017-19 | |
| log per capita income, 2011 PPP | 4.76 | 1.41 | 5.52 | 1.14 | 5.55 | 1.05 |
| HH head, less than complete primary education | 0.56 | 0.50 | 0.41 | 0.49 | 0.38 | 0.49 |
| HH head, less than complete secondary education | 0.18 | 0.38 | 0.18 | 0.38 | 0.16 | 0.37 |
| HH head, less than complete tertiary education | 0.18 | 0.38 | 0.26 | 0.44 | 0.30 | 0.46 |
| HH head, complete tertiary education | 0.09 | 0.28 | 0.14 | 0.35 | 0.15 | 0.36 |
| HH max, less than complete primary education | 0.35 | 0.48 | 0.19 | 0.39 | 0.18 | 0.39 |
| HH max, less than complete secondary education | 0.24 | 0.43 | 0.23 | 0.42 | 0.21 | 0.40 |
| HH max, less than complete tertiary education | 0.29 | 0.45 | 0.37 | 0.48 | 0.40 | 0.49 |
| HH max, complete tertiary education | 0.12 | 0.33 | 0.22 | 0.41 | 0.21 | 0.41 |
| HH head age | 43.66 | 14.59 | 46.23 | 15.09 | 46.34 | 15.23 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HH head male | 0.82 | 0.39 | 0.78 | 0.42 | 0.74 | 0.44 |
| HH head married | 0.77 | 0.42 | 0.73 | 0.44 | 0.69 | 0.46 |
| HH size | 4.45 | 2.25 | 3.92 | 2.01 | 3.45 | 1.80 |
| Household members aged 0 to 2 | 0.35 | 0.59 | 0.25 | 0.50 | 0.19 | 0.43 |
| Household members aged 3 to 11 | 1.09 | 1.22 | 0.76 | 1.00 | 0.66 | 0.93 |
| Household members aged 12 to 17 | 0.65 | 0.90 | 0.53 | 0.81 | 0.41 | 0.70 |
| Household members aged 18 to 59 | 2.13 | 1.16 | 2.04 | 1.21 | 1.85 | 1.11 |
| Household members aged 60+ | 0.26 | 0.56 | 0.34 | 0.63 | 0.35 | 0.64 |
| HH head self-employed | 0.57 | 0.50 | 0.56 | 0.50 | 0.58 | 0.49 |
| HH head wage earner | 0.35 | 0.48 | 0.37 | 0.48 | 0.34 | 0.47 |
| HH head unpaid worker | 0.01 | 0.11 | 0.01 | 0.08 | 0.01 | 0.09 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Brazil (Census) | 2000 | | 2010 | | | |
| log per capita income, 2011 PPP | 5.60 | 1.15 | 5.78 | 1.10 | | |
| HH head, less than primary education | 0.58 | 0.49 | 0.42 | 0.49 | | |
| HH head, complete primary education | 0.20 | 0.40 | 0.25 | 0.43 | | |
| HH head, complete secondary education | 0.16 | 0.36 | 0.23 | 0.42 | | |
| HH head, more than secondary education | 0.06 | 0.24 | 0.11 | 0.31 | | |
| HH max, less than primary education | 0.30 | 0.46 | 0.19 | 0.39 | | |
| HH max, complete primary education | 0.32 | 0.47 | 0.29 | 0.45 | | |
| HH max, complete secondary education | 0.28 | 0.45 | 0.35 | 0.48 | | |
| HH max, more than secondary education | 0.10 | 0.30 | 0.17 | 0.38 | | |
| HH head age | 45.81 | 15.48 | 46.73 | 15.89 | | |
| HH head male | 0.75 | 0.43 | 0.61 | 0.49 | | |
| HH head married | 0.72 | 0.45 | 0.67 | 0.47 | | |
| HH size | 3.74 | 1.89 | 3.32 | 1.66 | | |
| Household members aged 0 to 2 | 0.21 | 0.47 | 0.14 | 0.38 | | |
| Household members aged 3 to 11 | 0.65 | 0.94 | 0.48 | 0.79 | | |
| Household members aged 12 to 17 | 0.47 | 0.78 | 0.36 | 0.67 | | |
| Household members aged 18 to 59 | 2.08 | 1.17 | 1.97 | 1.14 | | |
| Household members aged 60+ | 0.33 | 0.62 | 0.36 | 0.65 | | |
| HH head self-employed | 0.27 | 0.44 | 0.20 | 0.40 | | |
| HH head wage earner | 0.45 | 0.50 | 0.47 | 0.50 | | |
| HH head unpaid worker | 0.00 | 0.04 | 0.00 | 0.06 | | |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Chile | 2000-03 | | 2009-11 | | 2015-17 | |
| log per capita income, 2011 PPP | 5.43 | 1.06 | 5.72 | 0.97 | 6.02 | 0.98 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HH head, less than complete primary education | 0.23 | 0.42 | 0.20 | 0.40 | 0.15 | 0.36 |
| HH head, less than complete secondary education | 0.32 | 0.47 | 0.29 | 0.46 | 0.26 | 0.44 |
| HH head, less than complete tertiary education | 0.30 | 0.46 | 0.34 | 0.47 | 0.36 | 0.48 |
| HH head, complete tertiary education | 0.15 | 0.36 | 0.17 | 0.38 | 0.22 | 0.42 |
| HH max, less than complete primary education | 0.07 | 0.25 | 0.05 | 0.21 | 0.04 | 0.19 |
| HH max, less than complete secondary education | 0.23 | 0.42 | 0.18 | 0.38 | 0.14 | 0.35 |
| HH max, less than complete tertiary education | 0.47 | 0.50 | 0.51 | 0.50 | 0.47 | 0.50 |
| HH max, complete tertiary education | 0.23 | 0.42 | 0.26 | 0.44 | 0.34 | 0.48 |
| HH head age | 46.73 | 13.67 | 49.53 | 14.23 | 50.02 | 14.71 |
| HH head male | 0.79 | 0.41 | 0.67 | 0.47 | 0.62 | 0.49 |
| HH head married | 0.76 | 0.43 | 0.68 | 0.46 | 0.62 | 0.49 |
| HH size | 4.03 | 1.72 | 3.75 | 1.66 | 3.38 | 1.58 |
| Household members aged 0 to 2 | 0.19 | 0.43 | 0.16 | 0.40 | 0.13 | 0.36 |
| Household members aged 3 to 11 | 0.68 | 0.85 | 0.49 | 0.73 | 0.44 | 0.70 |
| Household members aged 12 to 17 | 0.47 | 0.70 | 0.39 | 0.62 | 0.30 | 0.55 |
| Household members aged 18 to 59 | 2.39 | 1.15 | 2.29 | 1.20 | 2.06 | 1.14 |
| Household members aged 60+ | 0.32 | 0.63 | 0.41 | 0.69 | 0.46 | 0.72 |
| HH head self-employed | 0.24 | 0.43 | 0.22 | 0.41 | 0.22 | 0.41 |
| HH head wage earner | 0.59 | 0.49 | 0.58 | 0.49 | 0.60 | 0.49 |
| HH head unpaid worker | 0.00 | 0.04 | 0.00 | 0.03 | 0.00 | 0.03 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Colombia | 2001-03 | | 2008-10 | | 2017-19 | |
| log per capita income, 2011 PPP | 5.01 | 1.10 | 5.35 | 1.05 | 5.60 | 1.00 |
| HH head, less than complete primary education | 0.32 | 0.47 | 0.29 | 0.45 | 0.22 | 0.41 |
| HH head, less than complete secondary education | 0.37 | 0.48 | 0.35 | 0.48 | 0.31 | 0.46 |
| HH head, less than complete tertiary education | 0.20 | 0.40 | 0.25 | 0.44 | 0.35 | 0.48 |
| HH head, complete tertiary education | 0.10 | 0.29 | 0.11 | 0.31 | 0.13 | 0.33 |
| HH max, less than complete primary education | 0.10 | 0.30 | 0.09 | 0.28 | 0.06 | 0.24 |
| HH max, less than complete secondary education | 0.36 | 0.48 | 0.31 | 0.46 | 0.22 | 0.41 |
| HH max, less than complete tertiary education | 0.37 | 0.48 | 0.43 | 0.50 | 0.50 | 0.50 |
| HH max, complete tertiary education | 0.16 | 0.37 | 0.18 | 0.38 | 0.22 | 0.41 |
| HH head age | 45.56 | 14.57 | 45.87 | 14.47 | 46.77 | 15.09 |
| HH head male | 0.76 | 0.43 | 0.73 | 0.45 | 0.67 | 0.47 |
| HH head married | 0.72 | 0.45 | 0.68 | 0.47 | 0.64 | 0.48 |
| HH size | 4.26 | 2.03 | 3.80 | 1.88 | 3.47 | 1.77 |
| Household members aged 0 to 2 | 0.26 | 0.51 | 0.21 | 0.46 | 0.17 | 0.41 |
| Household members aged 3 to 11 | 0.88 | 1.04 | 0.68 | 0.92 | 0.56 | 0.82 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Household members aged 12 to 17 | 0.51 | 0.79 | 0.48 | 0.75 | 0.36 | 0.65 |
| Household members aged 18 to 59 | 2.34 | 1.19 | 2.15 | 1.11 | 2.04 | 1.11 |
| Household members aged 60+ | 0.32 | 0.62 | 0.30 | 0.60 | 0.35 | 0.65 |
| HH head self-employed | 0.44 | 0.50 | 0.46 | 0.50 | 0.44 | 0.50 |
| HH head wage earner | 0.40 | 0.49 | 0.39 | 0.49 | 0.40 | 0.49 |
| HH head unpaid worker | 0.00 | 0.05 | 0.00 | 0.07 | 0.00 | 0.06 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Costa Rica | 2001-03 | | 2008-09 | | | |
| log per capita income, 2011 PPP | 5.68 | 0.98 | 5.86 | 0.96 | | |
| HH head, less than complete primary education | 0.23 | 0.42 | 0.20 | 0.40 | | |
| HH head, less than complete secondary education | 0.47 | 0.50 | 0.48 | 0.50 | | |
| HH head, less than complete tertiary education | 0.17 | 0.37 | 0.17 | 0.38 | | |
| HH head, complete tertiary education | 0.12 | 0.32 | 0.15 | 0.36 | | |
| HH max, less than complete primary education | 0.07 | 0.25 | 0.05 | 0.22 | | |
| HH max, less than complete secondary education | 0.47 | 0.50 | 0.43 | 0.49 | | |
| HH max, less than complete tertiary education | 0.28 | 0.45 | 0.29 | 0.46 | | |
| HH max, complete tertiary education | 0.18 | 0.39 | 0.23 | 0.42 | | |
| HH head age | 44.46 | 13.54 | 45.93 | 13.74 | | |
| HH head male | 0.78 | 0.42 | 0.73 | 0.45 | | |
| HH head married | 0.74 | 0.44 | 0.71 | 0.45 | | |
| HH size | 4.16 | 1.84 | 3.84 | 1.68 | | |
| Household members aged 0 to 2 | 0.21 | 0.45 | 0.17 | 0.41 | | |
| Household members aged 3 to 11 | 0.79 | 0.98 | 0.60 | 0.84 | | |
| Household members aged 12 to 17 | 0.56 | 0.82 | 0.46 | 0.72 | | |
| Household members aged 18 to 59 | 2.35 | 1.13 | 2.34 | 1.14 | | |
| Household members aged 60+ | 0.25 | 0.57 | 0.27 | 0.57 | | |
| HH head self-employed | 0.31 | 0.46 | 0.29 | 0.45 | | |
| HH head wage earner | 0.56 | 0.50 | 0.57 | 0.50 | | |
| HH head unpaid worker | 0.00 | 0.04 | 0.00 | 0.03 | | |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Dominican Republic | 2000-03 | | 2008-10 | | 2014-16 | |
| log per capita income, 2011 PPP | 5.51 | 0.94 | 5.42 | 0.93 | 5.65 | 0.90 |
| HH head, less than complete primary education | 0.56 | 0.50 | 0.47 | 0.50 | 0.40 | 0.49 |
| HH head, less than complete secondary education | 0.22 | 0.41 | 0.23 | 0.42 | 0.25 | 0.43 |
| HH head, less than complete tertiary education | 0.12 | 0.33 | 0.17 | 0.37 | 0.20 | 0.40 |
| HH head, complete tertiary education | 0.10 | 0.30 | 0.13 | 0.33 | 0.14 | 0.35 |
| HH max, less than complete primary education | 0.30 | 0.46 | 0.22 | 0.41 | 0.16 | 0.37 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HH max, less than complete secondary education | 0.30 | 0.46 | 0.27 | 0.44 | 0.25 | 0.43 |
| HH max, less than complete tertiary education | 0.25 | 0.43 | 0.32 | 0.47 | 0.36 | 0.48 |
| HH max, complete tertiary education | 0.15 | 0.36 | 0.20 | 0.40 | 0.23 | 0.42 |
| HH head age | 45.44 | 14.82 | 45.70 | 14.79 | 46.87 | 14.97 |
| HH head male | 0.76 | 0.43 | 0.72 | 0.45 | 0.68 | 0.47 |
| HH head married | 0.71 | 0.45 | 0.66 | 0.47 | 0.63 | 0.48 |
| HH size | 4.12 | 1.91 | 3.85 | 1.82 | 3.54 | 1.73 |
| Household members aged 0 to 2 | 0.23 | 0.49 | 0.20 | 0.44 | 0.17 | 0.42 |
| Household members aged 3 to 11 | 0.87 | 1.08 | 0.70 | 0.97 | 0.55 | 0.83 |
| Household members aged 12 to 17 | 0.54 | 0.83 | 0.51 | 0.80 | 0.44 | 0.73 |
| Household members aged 18 to 59 | 2.19 | 1.11 | 2.15 | 1.09 | 2.06 | 1.08 |
| Household members aged 60+ | 0.29 | 0.59 | 0.29 | 0.58 | 0.32 | 0.60 |
| HH head self-employed | 0.44 | 0.50 | 0.44 | 0.50 | 0.41 | 0.49 |
| HH head wage earner | 0.41 | 0.49 | 0.40 | 0.49 | 0.43 | 0.50 |
| HH head unpaid worker | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.03 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Ecuador | 2003-04 | | 2009-11 | | 2017-19 | |
| log per capita income, 2011 PPP | 4.91 | 1.02 | 5.19 | 0.98 | 5.44 | 1.00 |
| HH head, less than complete primary education | 0.32 | 0.47 | 0.29 | 0.45 | 0.18 | 0.38 |
| HH head, less than complete secondary education | 0.44 | 0.50 | 0.45 | 0.50 | 0.43 | 0.50 |
| HH head, less than complete tertiary education | 0.20 | 0.40 | 0.17 | 0.38 | 0.25 | 0.44 |
| HH head, complete tertiary education | 0.04 | 0.19 | 0.09 | 0.28 | 0.13 | 0.34 |
| HH max, less than complete primary education | 0.12 | 0.32 | 0.10 | 0.30 | 0.06 | 0.24 |
| HH max, less than complete secondary education | 0.46 | 0.50 | 0.41 | 0.49 | 0.30 | 0.46 |
| HH max, less than complete tertiary education | 0.36 | 0.48 | 0.33 | 0.47 | 0.41 | 0.49 |
| HH max, complete tertiary education | 0.06 | 0.24 | 0.16 | 0.36 | 0.23 | 0.42 |
| HH head age | 48.08 | 15.05 | 50.90 | 15.20 | 49.81 | 15.09 |
| HH head male | 0.81 | 0.39 | 0.78 | 0.42 | 0.74 | 0.44 |
| HH head married | n.a | n.a | 0.70 | 0.46 | 0.68 | 0.47 |
| HH size | 4.45 | 2.22 | 4.13 | 2.09 | 3.78 | 1.90 |
| Household members aged 0 to 2 | 0.26 | 0.52 | 0.20 | 0.45 | 0.16 | 0.40 |
| Household members aged 3 to 11 | 0.96 | 1.13 | 0.73 | 0.99 | 0.63 | 0.88 |
| Household members aged 12 to 17 | 0.62 | 0.87 | 0.56 | 0.82 | 0.49 | 0.75 |
| Household members aged 18 to 59 | 2.21 | 1.28 | 2.17 | 1.30 | 2.08 | 1.23 |
| Household members aged 60+ | 0.40 | 0.68 | 0.48 | 0.73 | 0.43 | 0.71 |
| HH head self-employed | 0.46 | 0.50 | 0.44 | 0.50 | 0.45 | 0.50 |
| HH head wage earner | 0.45 | 0.50 | 0.44 | 0.50 | 0.43 | 0.50 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HH head unpaid worker | 0.00 | 0.06 | 0.00 | 0.07 | 0.01 | 0.10 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Honduras | 2004-06 | | 2009-11 | | 2017-19 | |
| log per capita income, 2011 PPP | 4.92 | 1.19 | 5.17 | 1.13 | 5.03 | 1.11 |
| HH head, less than complete primary education | 0.55 | 0.50 | 0.51 | 0.50 | 0.43 | 0.50 |
| HH head, less than complete secondary education | 0.30 | 0.46 | 0.34 | 0.47 | 0.40 | 0.49 |
| HH head, less than complete tertiary education | 0.11 | 0.31 | 0.10 | 0.31 | 0.11 | 0.31 |
| HH head, complete tertiary education | 0.04 | 0.19 | 0.04 | 0.21 | 0.06 | 0.23 |
| HH max, less than complete primary education | 0.23 | 0.42 | 0.16 | 0.37 | 0.12 | 0.33 |
| HH max, less than complete secondary education | 0.51 | 0.50 | 0.53 | 0.50 | 0.51 | 0.50 |
| HH max, less than complete tertiary education | 0.21 | 0.41 | 0.23 | 0.42 | 0.26 | 0.44 |
| HH max, complete tertiary education | 0.05 | 0.23 | 0.07 | 0.26 | 0.10 | 0.30 |
| HH head age | 45.85 | 15.45 | 47.57 | 15.66 | 48.44 | 15.87 |
| HH head male | 0.76 | 0.43 | 0.71 | 0.45 | 0.69 | 0.46 |
| HH head married | 0.75 | 0.44 | 0.72 | 0.45 | 0.70 | 0.46 |
| HH size | 5.01 | 2.33 | 4.80 | 2.26 | 4.35 | 2.02 |
| Household members aged 0 to 2 | 0.33 | 0.55 | 0.30 | 0.53 | 0.26 | 0.49 |
| Household members aged 3 to 11 | 1.25 | 1.27 | 1.01 | 1.13 | 0.82 | 0.98 |
| Household members aged 12 to 17 | 0.79 | 0.98 | 0.77 | 0.96 | 0.57 | 0.80 |
| Household members aged 18 to 59 | 2.33 | 1.19 | 2.38 | 1.26 | 2.31 | 1.23 |
| Household members aged 60+ | 0.33 | 0.61 | 0.37 | 0.65 | 0.41 | 0.67 |
| HH head self-employed | 0.48 | 0.50 | 0.51 | 0.50 | 0.46 | 0.50 |
| HH head wage earner | 0.38 | 0.48 | 0.34 | 0.47 | 0.37 | 0.48 |
| HH head unpaid worker | 0.00 | 0.06 | 0.01 | 0.07 | 0.01 | 0.09 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Mexico | 2000 | | 2010 | | 2015 | |
| log per capita income, 2011 PPP | 5.21 | 0.97 | 5.31 | 0.98 | 5.27 | 0.91 |
| HH head, less than primary education | 0.29 | 0.45 | 0.23 | 0.42 | 0.19 | 0.39 |
| HH head, complete primary education | 0.46 | 0.50 | 0.47 | 0.50 | 0.48 | 0.50 |
| HH head, complete secondary education | 0.14 | 0.34 | 0.17 | 0.38 | 0.19 | 0.40 |
| HH head, more than secondary education | 0.11 | 0.31 | 0.12 | 0.33 | 0.14 | 0.35 |
| HH max, less than primary education | 0.07 | 0.26 | 0.05 | 0.22 | 0.04 | 0.19 |
| HH max, complete primary education | 0.51 | 0.50 | 0.44 | 0.50 | 0.40 | 0.49 |
| HH max, complete secondary education | 0.25 | 0.43 | 0.30 | 0.46 | 0.33 | 0.47 |
| HH max, more than secondary education | 0.17 | 0.38 | 0.20 | 0.40 | 0.23 | 0.42 |
| HH head age | 42.57 | 14.02 | 45.50 | 14.33 | 46.13 | 14.32 |
| HH head male | 0.83 | 0.38 | 0.78 | 0.41 | 0.73 | 0.44 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HH head married | 0.81 | 0.39 | 0.75 | 0.43 | 0.74 | 0.44 |
| HH size | 4.32 | 1.94 | 4.07 | 1.92 | 3.94 | 1.85 |
| Household members aged 0 to 2 | 0.28 | 0.52 | 0.23 | 0.48 | 0.21 | 0.46 |
| Household members aged 3 to 11 | 0.89 | 1.04 | 0.72 | 0.94 | 0.66 | 0.89 |
| Household members aged 12 to 17 | 0.57 | 0.85 | 0.49 | 0.76 | 0.45 | 0.72 |
| Household members aged 18 to 59 | 2.36 | 1.16 | 2.34 | 1.20 | 2.32 | 1.18 |
| Household members aged 60+ | 0.23 | 0.54 | 0.28 | 0.60 | 0.30 | 0.61 |
| HH head self-employed | 0.25 | 0.44 | 0.26 | 0.44 | 0.22 | 0.42 |
| HH head wage earner | 0.61 | 0.49 | 0.58 | 0.49 | 0.59 | 0.49 |
| HH head unpaid worker | 0.01 | 0.07 | 0.01 | 0.07 | 0.01 | 0.07 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Panama | 2001-03 | | 2009-11 | | 2017-19 | |
| log per capita income, 2011 PPP | 5.49 | 1.19 | 5.75 | 1.13 | 6.05 | 1.16 |
| HH head, less than complete primary education | 0.21 | 0.41 | 0.16 | 0.37 | 0.13 | 0.34 |
| HH head, less than complete secondary education | 0.44 | 0.50 | 0.41 | 0.49 | 0.40 | 0.49 |
| HH head, less than complete tertiary education | 0.27 | 0.45 | 0.31 | 0.46 | 0.32 | 0.47 |
| HH head, complete tertiary education | 0.08 | 0.27 | 0.11 | 0.32 | 0.14 | 0.35 |
| HH max, less than complete primary education | 0.07 | 0.26 | 0.05 | 0.23 | 0.04 | 0.19 |
| HH max, less than complete secondary education | 0.36 | 0.48 | 0.32 | 0.47 | 0.27 | 0.44 |
| HH max, less than complete tertiary education | 0.42 | 0.49 | 0.43 | 0.50 | 0.45 | 0.50 |
| HH max, complete tertiary education | 0.14 | 0.35 | 0.19 | 0.39 | 0.24 | 0.43 |
| HH head age | 46.06 | 14.47 | 47.65 | 14.86 | 50.75 | 14.54 |
| HH head male | 0.79 | 0.41 | 0.72 | 0.45 | 0.68 | 0.47 |
| HH head married | 0.73 | 0.45 | 0.68 | 0.47 | 0.66 | 0.48 |
| HH size | 4.26 | 2.30 | 3.81 | 2.14 | 3.73 | 2.08 |
| Household members aged 0 to 2 | 0.28 | 0.54 | 0.22 | 0.48 | 0.18 | 0.46 |
| Household members aged 3 to 11 | 0.84 | 1.11 | 0.71 | 1.03 | 0.58 | 0.94 |
| Household members aged 12 to 17 | 0.51 | 0.81 | 0.44 | 0.75 | 0.42 | 0.72 |
| Household members aged 18 to 59 | 2.34 | 1.24 | 2.09 | 1.14 | 2.11 | 1.23 |
| Household members aged 60+ | 0.31 | 0.61 | 0.35 | 0.64 | 0.44 | 0.70 |
| HH head self-employed | 0.34 | 0.47 | 0.31 | 0.46 | 0.34 | 0.47 |
| HH head wage earner | 0.49 | 0.50 | 0.53 | 0.50 | 0.50 | 0.50 |
| HH head unpaid worker | 0.00 | 0.03 | 0.00 | 0.04 | 0.00 | 0.05 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Peru | 2000-03 | | 2008-10 | | 2017-19 | |
| log per capita income, 2011 PPP | 4.70 | 1.15 | 5.14 | 1.06 | 5.37 | 1.00 |
| HH head, less than complete primary education | 0.30 | 0.46 | 0.24 | 0.43 | 0.21 | 0.41 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HH head, less than complete secondary education | 0.31 | 0.46 | 0.28 | 0.45 | 0.27 | 0.45 |
| HH head, less than complete tertiary education | 0.26 | 0.44 | 0.29 | 0.46 | 0.33 | 0.47 |
| HH head, complete tertiary education | 0.13 | 0.34 | 0.18 | 0.38 | 0.18 | 0.39 |
| HH max, less than complete primary education | 0.11 | 0.31 | 0.08 | 0.28 | 0.08 | 0.28 |
| HH max, less than complete secondary education | 0.27 | 0.45 | 0.21 | 0.40 | 0.18 | 0.38 |
| HH max, less than complete tertiary education | 0.36 | 0.48 | 0.39 | 0.49 | 0.41 | 0.49 |
| HH max, complete tertiary education | 0.26 | 0.44 | 0.32 | 0.47 | 0.33 | 0.47 |
| HH head age | 47.55 | 14.95 | 49.62 | 14.91 | 51.99 | 14.88 |
| HH head male | 0.81 | 0.39 | 0.77 | 0.42 | 0.71 | 0.45 |
| HH head married | 0.74 | 0.44 | 0.72 | 0.45 | 0.66 | 0.47 |
| HH size | 4.61 | 2.21 | 4.22 | 2.06 | 3.74 | 1.88 |
| Household members aged 0 to 2 | 0.26 | 0.50 | 0.22 | 0.46 | 0.16 | 0.40 |
| Household members aged 3 to 11 | 0.96 | 1.08 | 0.72 | 0.93 | 0.59 | 0.84 |
| Household members aged 12 to 17 | 0.64 | 0.87 | 0.56 | 0.79 | 0.43 | 0.68 |
| Household members aged 18 to 59 | 2.39 | 1.38 | 2.30 | 1.34 | 2.05 | 1.28 |
| Household members aged 60+ | 0.39 | 0.67 | 0.44 | 0.71 | 0.51 | 0.75 |
| HH head self-employed | 0.55 | 0.50 | 0.52 | 0.50 | 0.51 | 0.50 |
| HH head wage earner | 0.33 | 0.47 | 0.36 | 0.48 | 0.36 | 0.48 |
| HH head unpaid worker | 0.02 | 0.12 | 0.02 | 0.15 | 0.02 | 0.14 |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Uruguay | 2000-03 | | 2008-10 | | 2017-19 | |
| log per capita income, 2011 PPP | 5.76 | 1.02 | 5.81 | 1.07 | 6.11 | 0.96 |
| HH head, less than complete primary education | 0.15 | 0.35 | 0.13 | 0.33 | 0.07 | 0.25 |
| HH head, less than complete secondary education | 0.60 | 0.49 | 0.62 | 0.49 | 0.60 | 0.49 |
| HH head, less than complete tertiary education | 0.16 | 0.37 | 0.17 | 0.38 | 0.19 | 0.39 |
| HH head, complete tertiary education | 0.08 | 0.27 | 0.08 | 0.28 | 0.14 | 0.35 |
| HH max, less than complete primary education | 0.03 | 0.18 | 0.04 | 0.19 | 0.01 | 0.12 |
| HH max, less than complete secondary education | 0.55 | 0.50 | 0.56 | 0.50 | 0.49 | 0.50 |
| HH max, less than complete tertiary education | 0.27 | 0.45 | 0.27 | 0.44 | 0.29 | 0.45 |
| HH max, complete tertiary education | 0.14 | 0.35 | 0.14 | 0.35 | 0.21 | 0.41 |
| HH head age | 48.81 | 14.37 | 48.59 | 14.47 | 47.74 | 14.39 |
| HH head male | 0.74 | 0.44 | 0.68 | 0.47 | 0.58 | 0.49 |
| HH head married | 0.70 | 0.46 | 0.65 | 0.48 | 0.65 | 0.48 |
| HH size | 3.58 | 1.71 | 3.20 | 1.61 | 3.11 | 1.45 |
| Household members aged 0 to 2 | 0.15 | 0.41 | 0.13 | 0.37 | 0.12 | 0.35 |
| Household members aged 3 to 11 | 0.56 | 0.89 | 0.47 | 0.81 | 0.41 | 0.72 |
| Household members aged 12 to 17 | 0.39 | 0.69 | 0.36 | 0.68 | 0.32 | 0.61 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Household members aged 18 to 59 | 2.07 | 1.07 | 1.86 | 1.02 | 1.90 | 0.99 |
| Household members aged 60+ | 0.41 | 0.68 | 0.38 | 0.66 | 0.36 | 0.65 |
| HH head self-employed | 0.27 | 0.44 | 0.28 | 0.45 | 0.26 | 0.44 |
| HH head wage earner | 0.53 | 0.50 | 0.57 | 0.49 | 0.56 | 0.50 |
| HH head unpaid worker | 0.00 | 0.04 | 0.00 | 0.05 | 0.00 | 0.04 |

**Appendix Table A5. Survey grouping and sample sizes used in the income gap analysis**

| | First period | Sample | Last period | Sample |
|---|---|---|---|---|
| Argentina | 2003 2004 2005 | 49,684 | 2017 2018 2019 | 61,061 |
| Bolivia | 2001 2002 | 9,014 | 2017 2018 2019 | 24,552 |
| Brazil | 2012 2013 2014 | 256,293 | 2017 2018 2019 | 243,827 |
| Chile | 2000 2003 | 84,428 | 2015 2017 | 91,397 |
| Colombia | 2001 2002 2003 | 64,975 | 2017 2018 2019 | 433,130 |
| Costa Rica | 2001 2002 2003 | 20,323 | 2008 2009 | 16,948 |
| Dominican Republic | 2000 2001 2002 | 11,415 | 2014 2015 2016 | 14,771 |
| Ecuador | 2003 2004 | 43,875 | 2017 2018 2019 | 45,635 |
| Honduras | 2004 2005 2006 | 26,311 | 2017 2018 2019 | 12,323 |
| Mexico | 2000 2002 2004 | 37,672 | 2016 2018 | 103,081 |
| Panama | 2001 2002 2003 | 27,020 | 2017 2018 2019 | 21,983 |
| Peru | 2000 2001 2002 2003 | 40,766 | 2017 2018 2019 | 80,318 |
| Paraguay | 2002 2003 2004 | 16,160 | 2017 2018 2019 | 13,799 |
| Uruguay | 2000 2001 2002 | 48,579 | 2017 2018 2019 | 61,752 |

**Appendix Table A6. Survey grouping and sample sizes used in the income gap analysis**

| | Number of municipalities in leading locations | Location premiums, latest period (end of 2010s) | | | | Location typology | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Dev. | Min | Max | Metro - large | Metro - small | Urban | | Rural-large | Rural-small |
| ARG | 1 | 5.01 | | | | | | | | | |
| BOL | 1 | 5.17 | | | | | | | | | |
| BRA | 3 | 5.05 | 0.03 | 5.03 | 5.09 | 3 | | | | | |
| CHL | 32 | 5.52 | 0.26 | 5.26 | 6.35 | | | 32 | | | |
| COL | 1 | 4.98 | | | | | | | | | |
| CRI | 1 | 5.75 | | | | | | 1 | | | |
| DOM | 1 | 5.07 | | | | | | 1 | | | |
| ECU | 1 | 4.56 | | | | | | 1 | | | |
| HND | 1 | 4.47 | | | | | | 1 | | | |
| PAN | 1 | 4.89 | | | | | | | | | |
| PER | 2 | 4.39 | 0.13 | 4.29 | 4.48 | | | 2 | | | |
| URY | 1 | 4.93 | | | | | | | | | |
| | | | | | | Metro - large | Metro - small | Urban - large | Urban - small | Rural - large | Rural - small |
| MEX | 56 | 4.95 | 0.13 | 4.58 | 5.27 | 5 | 2 | 32 | 12 | 3 | 2 |

**Appendix Table A7. Moran's I statistic estimates for global spatial autocorrelation**

| | Residuals, latest | | Location Premium, latest | |
|---|---|---|---|---|
| | Moran Index | p-value | Moran Index | p-value |
| Second administrative level | | | | |
| Brazil | -0.015 | 0.217 | 0.911 | 0.000 |
| Mexico | 0.006 | 0.328 | 0.565 | 0.000 |
| Chile | 0.006 | 0.745 | 0.566 | 0.000 |
| Ecuador | 0.012 | 0.562 | 0.173 | 0.000 |
| Costa Rica | -0.042 | 0.391 | 0.323 | 0.000 |
| Dominican Republic | 0.009 | 0.567 | 0.351 | 0.000 |
| Honduras | 0.051 | 0.143 | 0.308 | 0.000 |
| Peru | -0.042 | 0.456 | 0.473 | 0.000 |
| First administrative level | | | | |
| Argentina | -0.170 | 0.540 | 0.815 | 0.000 |
| Bolivia | 0.130 | 0.443 | -0.143 | 0.957 |
| Colombia | 0.527 | 0.012 | 0.428 | 0.052 |
| Panama | -0.316 | 0.480 | -0.245 | 0.525 |
| Uruguay | 0.170 | 0.266 | 0.645 | 0.001 |

Note: Several types of spatial weight matrices $W$ are proposed in the literature. We selected an exponential type of spatial weight matrix with distance decay parameter 0.05 for the estimation of the Moran's I statistic show in the table.

**Appendix Table A8. Absolute convergence in location premium before sorting at different administrative levels by country and time period**

| | Annual per capita growth | | | | | |
|---|---|---|---|---|---|---|
| | Administrative level 1 | | | Administrative level 2 | | |
| **Mexico** | 1990-15 | 2000-10 | 2000-15 | 2000-15 | 2000-10 | 2000-15 |
| $\gamma_0^{bs}$ | -0.00817** | -0.0163*** | -0.0186*** | -0.0217*** | -0.0256*** | -0.0231*** |
| | (0.00373) | (0.00550) | (0.00467) | (0.000403) | (0.00104) | (0.000671) |
| Obs. | 32 | 32 | 32 | 2,301 | 2,330 | 2,320 |
| R-squared | 0.138 | 0.225 | 0.345 | 0.558 | 0.207 | 0.338 |
| **Brazil** | 2002/04-2014/15 | 2000-10 | 2009/11-2014/15 | 2002/04-2014/15 | 2000-10 | 2009/11-2014/15 |
| $\gamma_0^{bs}$ | -0.0155*** | -0.00506 | -0.0185* | -0.0912*** | -0.00913*** | -0.106*** |
| | (0.00449) | (0.00477) | (0.00920) | (0.00219) | (0.000487) | (0.0104) |
| Obs. | 27 | 27 | 27 | 817 | 2,040 | 817 |
| R-squared | 0.322 | 0.043 | 0.140 | 0.680 | 0.147 | 0.112 |
| **Colombia** | 2001/03-2017/19 | 2001/03-2008/10 | 2011-19 | | | 2011-19 |
| $\gamma_0^{bs}$ | -0.0341*** | -0.0696*** | -0.0244*** | | | -0.0319*** |
| | (0.00774) | (0.0163) | (0.00694) | | | (0.00187) |
| Obs. | 24 | 24 | 33 | | | 1122 |
| R-squared | 0.469 | 0.453 | 0.286 | | | 0.206 |
| **Peru** | 2000/03-2017/19 | 2000/03-2008/10 | 2008/10-2017/19 | 2000/03-2017/19 | 2000/03-2008/10 | 2008/10-2017/19 |
| $\gamma_0^{bs}$ | -0.0129*** | -0.0122* | -0.0170** | -0.0199*** | -0.0243*** | -0.0247*** |
| | (0.00419) | (0.00720) | (0.00679) | (0.00175) | (0.00350) | (0.00299) |
| Obs. | 24 | 24 | 24 | 186 | 186 | 186 |
| R-squared | 0.301 | 0.113 | 0.222 | 0.413 | 0.208 | 0.270 |
| **Ecuador** | 2003/04-2017/19 | 2003/04-2009/11 | 2009/11-2017/19 | 2003/04-2017/19 | 2003/04-2009/11 | 2009/11-2017/19 |
| $\gamma_0^{bs}$ | -0.0340*** | -0.0565*** | -0.0158 | -0.0397*** | -0.0453*** | -0.0547*** |
| | (0.0107) | (0.0132) | (0.0244) | (0.00325) | (0.00536) | (0.00667) |
| Obs. | 21 | 21 | 21 | 191 | 191 | 191 |
| R-squared | 0.348 | 0.492 | 0.021 | 0.442 | 0.275 | 0.263 |
| **Chile** | 2000/03-2015/17 | 2000/03-2009/11 | 2009/11-2015/17 | 2000/03-2015/17 | 2000/03-2009/11 | 2009/11-2015/17 |
| $\gamma_0^{bs}$ | -0.0189*** | -0.0222*** | -0.0252 | -0.0206*** | -0.0244*** | -0.0311*** |
| | (0.00289) | (0.00491) | (0.0149) | (0.00116) | (0.00185) | (0.00382) |
| Obs. | 13 | 13 | 13 | 299 | 299 | 299 |
| R-squared | 0.796 | 0.651 | 0.206 | 0.514 | 0.369 | 0.183 |
| **Dominican Republic** | 2000/02-2014/16 | 2000/02-2008/10 | 2008/10-2014/16 | 2000/02-2014/16 | 2000/02-2008/10 | 2008/10-2014/16 |
| $\gamma_0^{bs}$ | -0.0221*** | -0.0234** | -0.0141 | -0.0380*** | -0.0595*** | -0.0478*** |
| | (0.00685) | (0.00870) | (0.0103) | (0.00408) | (0.00631) | (0.0114) |
| Obs. | 30 | 30 | 30 | 115 | 115 | 115 |
| R-squared | 0.270 | 0.205 | 0.063 | 0.434 | 0.440 | 0.135 |

**Appendix Table A8. Absolute convergence in location premium before sorting at different administrative levels by country and time period (contd.)**

| | Annual location premium growth (before sorting) | | | | | |
|---|---|---|---|---|---|---|
| | Administrative level 1 | | | Administrative level 2 | | |
| **Honduras** | 2004/06-2017/19 | 2004/06-2009/11 | 2009/11-2017/19 | 2004/06-2017/19 | 2004/06-2009/11 | 2009/11-2017/19 |
| $\gamma_0^{bs}$ | -0.0221*** | -0.0351*** | -0.0188 | -0.0318*** | -0.0577*** | -0.0513*** |
| | (0.00667) | (0.0114) | (0.0137) | (0.00332) | (0.00593) | (0.00712) |
| Obs. | 16 | 16 | 16 | 243 | 243 | 243 |
| R-squared | 0.440 | 0.403 | 0.119 | 0.275 | 0.281 | 0.177 |
| **Costa Rica** | | 2001/03-2008/09 | | | 2001/03-2008/09 | |
| $\gamma_0^{bs}$ | | -0.0160 | | | -0.0231*** | |
| | | (0.0113) | | | (0.00580) | |
| Obs. | | 7 | | | 79 | |
| R-squared | | 0.288 | | | 0.171 | |
| **Argentina** | 2003/05-2017/19 | 2003/05-2009/11 | 2009/11-2017/19 | | | |
| $\gamma_0^{bs}$ | -0.0170*** | -0.00892 | -0.0366*** | | | |
| | (0.00412) | (0.00728) | (0.0102) | | | |
| Obs. | 29 | 29 | 29 | | | |
| R-squared | 0.387 | 0.053 | 0.325 | | | |
| **Uruguay** | 2000/02-2017/19 | 2000/02-2008/10 | 2008/10-2017/19 | | | |
| $\gamma_0^{bs}$ | -0.0121** | -0.0270*** | 0.00242 | | | |
| | (0.00553) | (0.00924) | (0.00885) | | | |
| Obs. | 19 | 19 | 19 | | | |
| R-squared | 0.219 | 0.334 | 0.004 | | | |
| **Bolivia** | 2001/02-2017/19 | 2001/02-2011/13 | 2011/13-2017/19 | | | |
| $\gamma_0^{bs}$ | -0.0283*** | -0.0260* | -0.0594*** | | | |
| | (0.00548) | (0.0136) | (0.0148) | | | |
| Obs. | 9 | 9 | 9 | | | |
| R-squared | 0.792 | 0.345 | 0.698 | | | |
| **Panama** | 2001/03-2017/19 | 2001/03-2009/11 | 2009/11-2017/19 | | | |
| $\gamma_0^{bs}$ | -0.00534 | 0.00173 | -0.0171 | | | |
| | (0.00517) | (0.00524) | (0.0129) | | | |
| Obs. | 12 | 12 | 12 | | | |
| R-squared | 0.096 | 0.011 | 0.151 | | | |

Note: $\gamma_0^{bs}$ refers to the initial location premium before sorting. Location premiums before sorting are estimated using regressing model (1). For Mexico the analysis is based on census data for all periods while in Brazil this is the case for period 2000-2010. For the rest of the countries the analysis is based on SEDLAC harmonized household surveys. Only in Colombia (2011-19) the analysis is based on official aggregates of value-added data.

**Appendix Table A9. Decomposition of the gap between household per capita labor income in the leading and other areas by country**

*Dep. Variable: log head labor per capita income, real PPP*

| **Argentina** | **(2017-2019)** | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | | |
| | All (urban) | Bottom 40% | Skilled | | |
| Leading | 6.391*** | 4.592*** | 6.712*** | | |
| | (0.018) | (0.053) | (0.023) | | |
| Other regions | 5.834*** | 4.624*** | 6.450*** | | |
| | (0.005) | (0.009) | (0.009) | | |
| Difference | 0.557*** | -0.031 | 0.262*** | | |
| | (0.019) | (0.053) | (0.024) | | |
| Endowments | 0.361*** | 0.002 | 0.119*** | | |
| | (0.018) | (0.043) | (0.017) | | |
| Returns | 0.196*** | -0.033 | 0.143*** | | |
| | (0.023) | (0.063) | (0.025) | | |
| Observations | 61061 | 13936 | 13695 | | |
| **Bolivia** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.818*** | 4.876*** | 5.818*** | 6.316*** | 5.818*** |
| | (0.012) | (0.016) | (0.012) | (0.028) | (0.012) |
| Other regions | 5.354*** | 4.379*** | 5.664*** | 6.162*** | 4.927*** |
| | (0.009) | (0.013) | (0.006) | (0.018) | (0.019) |
| Difference | 0.464*** | 0.497*** | 0.155*** | 0.154*** | 0.891*** |
| | (0.015) | (0.020) | (0.013) | (0.033) | (0.023) |
| Endowments | 0.074*** | 0.057*** | -0.016** | -0.004 | 0.197*** |
| | (0.011) | (0.021) | (0.008) | (0.018) | (0.019) |
| Returns | 0.390*** | 0.440*** | 0.170*** | 0.158*** | 0.694*** |
| | (0.016) | (0.031) | (0.012) | (0.030) | (0.028) |
| Observations | 24552 | 8429 | 18882 | 2827 | 9387 |
| **Brazil** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.724*** | 4.135*** | 5.727*** | 6.598*** | 5.724*** |
| | (0.010) | (0.016) | (0.010) | (0.017) | (0.010) |
| Other regions | 5.219*** | 3.856*** | 5.328*** | 6.162*** | 4.541*** |
| | (0.003) | (0.004) | (0.003) | (0.007) | (0.005) |
| Difference | 0.505*** | 0.278*** | 0.399*** | 0.436*** | 1.183*** |
| | (0.010) | (0.016) | (0.010) | (0.018) | (0.011) |
| Endowments | 0.275*** | 0.005 | 0.220*** | 0.182*** | 0.647*** |
| | (0.008) | (0.010) | (0.008) | (0.012) | (0.013) |
| Returns | 0.230*** | 0.273*** | 0.179*** | 0.254*** | 0.537*** |
| | (0.008) | (0.018) | (0.008) | (0.017) | (0.014) |
| Observations | 243827 | 68160 | 181559 | 39779 | 75671 |

**Appendix Table A9. Decomposition of the gap between household per capita labor income in the leading and other areas by country (Contd.)**

*Dep. Variable: log head labor per capita income, real PPP*

| **Chile** | **(2015-2017)** | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 6.315*** | 5.014*** | 6.315*** | 6.966*** | 6.315*** |
| | (0.009) | (0.012) | (0.009) | (0.015) | (0.009) |
| Other regions | 5.943*** | 4.995*** | 5.939*** | 6.538*** | 5.961*** |
| | (0.004) | (0.004) | (0.004) | (0.008) | (0.008) |
| Difference | 0.372*** | 0.019 | 0.376*** | 0.428*** | 0.354*** |
| | (0.010) | (0.013) | (0.010) | (0.017) | (0.012) |
| Endowments | 0.193*** | -0.029*** | 0.156*** | 0.159*** | 0.363*** |
| | (0.007) | (0.006) | (0.006) | (0.010) | (0.010) |
| Returns | 0.180*** | 0.048*** | 0.220*** | 0.270*** | -0.009 |
| | (0.008) | (0.012) | (0.008) | (0.015) | (0.012) |
| Observations | 91397 | 25711 | 73778 | 21337 | 33021 |
| **Colombia** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.972*** | 4.692*** | 5.972*** | 6.681*** | 5.972*** |
| | (0.006) | (0.010) | (0.006) | (0.013) | (0.006) |
| Other regions | 5.446*** | 4.513*** | 5.532*** | 6.307*** | 5.223*** |
| | (0.002) | (0.003) | (0.002) | (0.005) | (0.005) |
| Difference | 0.526*** | 0.179*** | 0.440*** | 0.374*** | 0.749*** |
| | (0.007) | (0.010) | (0.007) | (0.014) | (0.008) |
| Endowments | 0.323*** | 0.037*** | 0.215*** | 0.132*** | 0.600*** |
| | (0.006) | (0.008) | (0.005) | (0.008) | (0.010) |
| Returns | 0.203*** | 0.142*** | 0.224*** | 0.242*** | 0.149*** |
| | (0.006) | (0.012) | (0.006) | (0.012) | (0.010) |
| Observations | 433130 | 136248 | 387778 | 85830 | 65620 |
| **Costa Rica** | **(2008-2009)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 6.121*** | 4.917*** | 6.121*** | 6.930*** | 6.121*** |
| | (0.019) | (0.021) | (0.019) | (0.041) | (0.019) |
| Other regions | 5.796*** | 4.848*** | 5.951*** | 6.792*** | 5.692*** |
| | (0.008) | (0.008) | (0.016) | (0.021) | (0.009) |
| Difference | 0.325*** | 0.068*** | 0.170*** | 0.138*** | 0.430*** |
| | (0.020) | (0.023) | (0.024) | (0.046) | (0.020) |
| Endowments | 0.254*** | 0.002 | 0.056*** | 0.100*** | 0.387*** |
| | (0.016) | (0.014) | (0.018) | (0.028) | (0.019) |
| Returns | 0.071*** | 0.066*** | 0.113*** | 0.038 | 0.042** |
| | (0.015) | (0.024) | (0.017) | (0.040) | (0.017) |
| Observations | 16948 | 5693 | 6306 | 1880 | 13249 |

**Appendix Table A9. Decomposition of the gap between household per capita labor income in the leading and other areas by country (Contd.)**

*Dep. Variable: log head labor per capita income, real PPP*

| **Dominican Republic** | **(2014-2016)** | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.917*** | 4.678*** | 5.917*** | 6.706*** | 5.917*** |
| | (0.028) | (0.028) | (0.028) | (0.054) | (0.028) |
| Other regions | 5.541*** | 4.639*** | 5.597*** | 6.210*** | 5.409*** |
| | (0.009) | (0.009) | (0.011) | (0.025) | (0.013) |
| Difference | 0.376*** | 0.040 | 0.320*** | 0.495*** | 0.508*** |
| | (0.029) | (0.030) | (0.030) | (0.060) | (0.030) |
| Endowments | 0.219*** | 0.004 | 0.165*** | 0.241*** | 0.348*** |
| | (0.022) | (0.020) | (0.021) | (0.044) | (0.029) |
| Returns | 0.156*** | 0.035 | 0.154*** | 0.254*** | 0.161*** |
| | (0.024) | (0.033) | (0.023) | (0.053) | (0.031) |
| Observations | 14771 | 5418 | 9072 | 1763 | 6985 |
| **Ecuador** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.757*** | 4.578*** | 5.757*** | 6.342*** | 5.757*** |
| | (0.015) | (0.024) | (0.015) | (0.027) | (0.015) |
| Other regions | 5.325*** | 4.370*** | 5.474*** | 6.148*** | 5.079*** |
| | (0.006) | (0.009) | (0.008) | (0.013) | (0.011) |
| Difference | 0.432*** | 0.207*** | 0.283*** | 0.193*** | 0.678*** |
| | (0.016) | (0.026) | (0.017) | (0.030) | (0.019) |
| Endowments | 0.286*** | 0.029 | 0.182*** | 0.113*** | 0.458*** |
| | (0.015) | (0.024) | (0.012) | (0.020) | (0.023) |
| Returns | 0.145*** | 0.178*** | 0.101*** | 0.081*** | 0.219*** |
| | (0.019) | (0.035) | (0.016) | (0.028) | (0.027) |
| Observations | 45635 | 15223 | 27616 | 7399 | 21581 |
| **Honduras** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.454*** | 4.085*** | 5.454*** | 6.320*** | 5.454*** |
| | (0.022) | (0.038) | (0.022) | (0.045) | (0.022) |
| Other regions | 5.005*** | 3.898*** | 5.239*** | 6.195*** | 4.785*** |
| | (0.011) | (0.013) | (0.016) | (0.051) | (0.016) |
| Difference | 0.449*** | 0.186*** | 0.214*** | 0.125* | 0.669*** |
| | (0.024) | (0.040) | (0.027) | (0.068) | (0.027) |
| Endowments | 0.337*** | -0.008 | 0.165*** | 0.150*** | 0.498*** |
| | (0.021) | (0.031) | (0.017) | (0.040) | (0.029) |
| Returns | 0.112*** | 0.194*** | 0.050** | -0.025 | 0.170*** |
| | (0.026) | (0.048) | (0.023) | (0.066) | (0.035) |
| Observations | 12323 | 4239 | 6518 | 791 | 8104 |

**Appendix Table A9. Decomposition of the gap between household per capita labor income in the leading and other areas by country (Contd.)**

*Dep. Variable: log head labor per capita income, real PPP*

| **Mexico** | **(2016-2018)** | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.358*** | 4.379*** | 5.358*** | 6.068*** | 5.358*** |
| | (0.014) | (0.014) | (0.014) | (0.031) | (0.014) |
| Other regions | 5.076*** | 4.116*** | 5.215*** | 5.817*** | 4.724*** |
| | (0.004) | (0.005) | (0.004) | (0.009) | (0.007) |
| Difference | 0.283*** | 0.263*** | 0.143*** | 0.251*** | 0.634*** |
| | (0.014) | (0.015) | (0.014) | (0.033) | (0.015) |
| Endowments | 0.195*** | 0.055*** | 0.101*** | 0.131*** | 0.430*** |
| | (0.012) | (0.013) | (0.010) | (0.024) | (0.019) |
| Returns | 0.088*** | 0.208*** | 0.042*** | 0.119*** | 0.204*** |
| | (0.014) | (0.021) | (0.012) | (0.033) | (0.021) |
| Observations | 103081 | 33905 | 63711 | 14225 | 43447 |
| **Panama** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 6.411*** | 5.082*** | 6.411*** | 7.106*** | 6.411*** |
| | (0.012) | (0.020) | (0.012) | (0.022) | (0.012) |
| Other regions | 5.671*** | 4.572*** | 6.081*** | 6.732*** | 5.389*** |
| | (0.011) | (0.013) | (0.015) | (0.023) | (0.014) |
| Difference | 0.740*** | 0.510*** | 0.330*** | 0.373*** | 1.022*** |
| | (0.016) | (0.023) | (0.019) | (0.032) | (0.018) |
| Endowments | 0.403*** | 0.167*** | 0.055*** | 0.149*** | 0.642*** |
| | (0.014) | (0.021) | (0.012) | (0.019) | (0.020) |
| Returns | 0.337*** | 0.344*** | 0.275*** | 0.225*** | 0.380*** |
| | (0.017) | (0.032) | (0.016) | (0.030) | (0.023) |
| Observations | 21983 | 8376 | 12061 | 3149 | 16812 |
| **Peru** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 5.870*** | 4.664*** | 5.870*** | 6.240*** | 5.870*** |
| | (0.009) | (0.018) | (0.009) | (0.014) | (0.009) |
| Other regions | 5.140*** | 4.305*** | 5.435*** | 5.813*** | 4.592*** |
| | (0.004) | (0.005) | (0.005) | (0.007) | (0.006) |
| Difference | 0.730*** | 0.359*** | 0.435*** | 0.427*** | 1.278*** |
| | (0.010) | (0.019) | (0.010) | (0.016) | (0.011) |
| Endowments | 0.228*** | 0.067** | 0.114*** | 0.083*** | 0.440*** |
| | (0.012) | (0.027) | (0.008) | (0.010) | (0.021) |
| Returns | 0.502*** | 0.293*** | 0.321*** | 0.344*** | 0.838*** |
| | (0.014) | (0.032) | (0.011) | (0.015) | (0.023) |
| Observations | 80318 | 33977 | 47690 | 17707 | 40888 |

**Appendix Table A9. Decomposition of the gap between household per capita labor income in the leading and other areas by country (Contd.)**

*Dep. Variable: log head labor per capita income, real PPP*

| **Paraguay** | **(2017-2019)** | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | All | Bottom 40% | Urban | Skilled | Rural |
| Leading | 6.277*** | 4.923*** | 6.277*** | 6.861*** | 6.277*** |
| | (0.034) | (0.053) | (0.034) | (0.048) | (0.034) |
| Other regions | 5.698*** | 4.675*** | 5.882*** | 6.454*** | 5.445*** |
| | (0.010) | (0.013) | (0.012) | (0.021) | (0.016) |
| Difference | 0.579*** | 0.248*** | 0.395*** | 0.407*** | 0.832*** |
| | (0.035) | (0.055) | (0.036) | (0.053) | (0.038) |
| Endowments | 0.444*** | 0.033 | 0.250*** | 0.236*** | 0.710*** |
| | (0.035) | (0.054) | (0.028) | (0.044) | (0.049) |
| Returns | 0.135*** | 0.215*** | 0.144*** | 0.171*** | 0.122** |
| | (0.034) | (0.074) | (0.028) | (0.048) | (0.049) |
| Observations | 13799 | 5275 | 7274 | 2087 | 7419 |
| **Uruguay** | **(2017-2019)** | | | | |
| | (1) | (2) | (3) | | |
| | All (urban) | Bottom 40% | Skilled | | |
| Leading | 6.380*** | 4.845*** | 7.070*** | | |
| | (0.006) | (0.012) | (0.009) | | |
| Other regions | 5.962*** | 4.863*** | 6.739*** | | |
| | (0.005) | (0.007) | (0.011) | | |
| Difference | 0.417*** | -0.018 | 0.331*** | | |
| | (0.007) | (0.014) | (0.014) | | |
| Endowments | 0.263*** | -0.017** | 0.114*** | | |
| | (0.006) | (0.007) | (0.009) | | |
| Returns | 0.154*** | -0.002 | 0.217*** | | |
| | (0.006) | (0.013) | (0.013) | | |
| Observations | 61752 | 13504 | 9058 | | |

Notes: Only urban residents included in the Argentina's and Uruguay's samples. Leading area, last period in each country shown in the table are, respectively, the City of Buenos Aires, 2017-19 in Argentina; Belo Horizonte, Sao Paulo, and Rio de Janeiro, 2017-19 in Brazil; Santiago, 2015 2017 in Chile; Bogotá, 2017-19 in Colombia; San Jose, 2008-09 in Costa Rica; City of Santo Domingo, 2017-19 in Dominican Republic; Quito (Urban Pichincha), 2017-19 in Ecuador; urban Tegucigalpa (Francisco Morazan), 2017-19 in Honduras; Mexico City metropolitan area, 2016 2018 in Mexico; urban Panama province, 2017-19 in Panama; Ascunsion, 2017-19 in Paraguay; Lima-Callao region 2017-19 in Peru; Montevideo, 2017-19 in Uruguay.