

## Who takes advantage of agglomeration effects?

Marked and persistent spatial disparities in incomes and wages amongst urban systems are a characteristic feature of countries all over around the world. Economic forces at national and global levels related to trends in population movements, housing markets and amenities provision have continuously reinforced this pattern. Empirical literature widely documents a positive nominal wage gradient across city-size (Baum-Snow and Pavan, 2012; Echeverri and Ayala, 2011; Glaeser and Mare, 2001; Glaeser and Gottlieb, 2009; Kemeny and Storper, 2012). Notwithstanding, the evidence in relation to its causal effects is inconclusive. This article aims to study the city size wage gap in Chile in order to better understand which mechanisms are at play on this phenomenon in a developing country context. Specifically, we are focused on differentiating agglomeration effects from human capital accumulation externalities in an attempt to explore the relative importance of these causal mechanisms in explaining the city-size wage gap in the context of developing countries.

Main theories regarding the city-size wage gap focus on agglomeration economies (Marshall, 1890; Duranton and Puga, 2004; Puga, 2010), differences in amenities and cost of living across the urban system (Roback, 1982), and the availability of endowments as explained by the literature developed under the frame of the New Economic Geography (Krugman 1999; Fujita 1991). Recently, spatial labour sorting as a source of the city-size wage gap has been put forward to explain wage disparities among locations (Combes, Duranton and Gobillon, 2008; 2011; Combes *et al.*, 2012). There is broad evidence illustrating the effect of agglomeration economies on wage disparities amongst developed countries urban systems, such that, according to Cheshire, Nathan and Overman (2014), there is consensus that doubling employment in a city raises the average labour productivity by around 5 to 6%<sup>1</sup>.

In the context of developing countries, the evidence provided by Duranton (2016), Combes, Demurger and Li (2015) and Chauvin, Glaeser and Tobio (2013) suggest that agglomeration effects could be even more important in explaining wage disparities than in their counterparts, developed countries. In essence, Duranton (2016) reported an elasticity wage-population of about 5% for the Colombian case, while Combes *et al.* (2015) and Chauvin *et al.* (2013) found that the same measure for China and India is about 10 to 20%. However, agglomeration effects as an explanation have been challenged and some studies attribute wage differences across cities to the so-called spatial labour sorting (Baum-Snow and Pavan 2012; Combes *et al.* 2008; Duranton and Monastiritoris 2002; Gibbons, Overman and Pelkonen, 2010; 2014; Gibbons, Overman and Resende, 2011; Moretti, 2013).

Spatial labour sorting theory establishes that high skill workers tend to be over-represented in denser areas, leading to an over-estimation of agglomeration effects on the city-size wage gap. This theory suggests that high skilled workers may sort into denser areas due to: (1) they may have a stronger preference for high density places and the associated better cultural amenities; and (2) the advantages of high density areas in terms of productivity benefits and its related specialised industry sort process (Combes *et al.*, 2008; 2011; Moretti, 2013). Thus, there is a location bias of

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<sup>1</sup> Research aiming to measure agglomeration economies effect among developed countries urban system are: De La Roca and Puga (2011), Combes *et al.* (2008), Melo and Graham (2009), and Rosenthal and Strange (2004), among others.

skilled workers that is mainly driven according to city-specific shifts in relative demand (Moretti 2013). In the words of Moretti (2013), labour sorting responds to an increase in the relative demand for skilled worker in cities due to localised skill-biased technical change, positive shocks to the product demand for skill-intensive industries that are predominantly located in cities or localised change to the stock of physical capital, coupled with capital-skill complementarity. Many studies confirm that higher educated workers correspond closely to variation in wages among countries and cities (Barro, 1997; Benhabib and Spiegel, 1994; Moretti, 2004). Authors such as Gibbons and Overman (2012) explore the case in Britain and Combes *et al.* (2008) similarly for France show that labour sorting effects are either bigger or similar than agglomeration effects in explaining the city-size wage gap.<sup>2</sup> However, there is still a lack of evidence for emerging and developing countries.

We aim to contribute to this knowledge gap by disentangling the agglomeration from labour sorting effects in the observed city-size wage gap in Chile. Chile has one of the highest levels of income and spatial inequality amongst the OECD members. This country is not only remarkable for its high urban primacy, with almost 40% of its population living in a single city, Santiago, but it has important disparities among housing prices and cost of living (Paredes and Iturra, 2013), employment and income across its urban hierarchy. The city-size wage gap in place in the Chilean urban system was described by Soto and Paredes (2016). As was shown by them, there is an average punishment in wages of about 35% for workers in more remote cities. As suggested by Chacón and Paredes (2015) the country's spatial wage disparities could be reinforced by spatial labour sorting. However, to our knowledge research has not been conducted exploring the extent of spatial labour sorting as a way to explain differences among cities' wages for the Chilean case.

This research argues that rather than a higher level of agglomeration effects as explanation of wage disparities among developing countries cities, as proposed by Duranton (2016), Chauvin *et al.* (2013) and Combes *et al.* (2015), this phenomenon should be explained by a higher spatial concentration of high-skill labour force in bigger cities. In conducting this, we estimate and disentangle the size of the skills composition effect of the observed city-size wage gap using eleven waves of the Chilean National Socioeconomic Characterisation Survey (CASEN 1992 to 2015). Our preliminary results suggest in fact, that the Chilean case supports our hypothesis.

Beyond disentangling city-size wage gap sources, our reflecting allows us to engage with the issue amongst academics and policy makers about how to deal with underperforming/declining places and suggest whether people-based against area-based policies could be more effective in achieving regional rebalancing.

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<sup>2</sup> Other studies dealing with differentiating agglomeration from spatial labour sorting effects are Mion and Naticcchione (2009), Dalmazzo and Blasio (2007) and Combes *et al.* (2008), Gibbons *et al.* (2010) and Moretti (2012) have engaged in study spatial labour sorting.

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