

Self-employment in the Andean Countries: Motivations and the Link to Productivity

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Self-employment in the Andean Countries: Motivations and the Link to Productivity¹

Zulima Leal and Nelson Chacón²

Abstract

We look at the possible channels in which self-employment can harm productivity outcomes in the Andean region and the motivations that incentive workers to opt for self-employment. We estimate quantile regressions with the purpose of identifying whether there is a monetary income premium for those at self-employment compared to wage earners at various levels of income. We find that there is a negative income premium for self-employed workers at the bottom 25% of the income distribution in the Andean countries, except for Venezuela, where although there is a positive income premium, the magnitude is very small to generate enough incentive to prefer self-employment. Our estimations also indicate that self-employed workers at the top 25% of the income distribution have larger positive income premiums. The evidence suggests two types of self-employed workers, one composed of higher income earners, and the other one by most workers, that given the absence of formal job opportunities choose self-employment, but would be better off in terms of income as dependent workers.

Key Words: Self-employment, quantile regressions, productivity, Andean countries.

JEL Code: J24, J23, O17, C31

¹ We would like to thank Marta Ruiz-Arranz for useful comments and observations. This paper extends to the Andean region the econometric analysis in the paper by Chacon, N., Stucchi, R. (2015), and builds a novel analysis of the productivity problem from the self-employment perspective.

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1. Introduction

The commodity boom in Latin America combined with sound macroeconomic policies underpinned economic growth and improvements in the labor market that are mainly observed across increases in salaries, the revival of employment rates, and notable reductions in unemployment. This trend is also common among Andean countries³ where we observe rapid gains in employment in the last two decades of above 10 percentage points (ppt) in Bolivia and Peru and modest increases for Ecuador, Venezuela and Colombia, sharp declines in unemployment rate in the 2000's at the time of the commodity boom, and rising real salaries, pushed by minimum wages increases, that for the region have been above productivity growth (Figure 1abcd).

In general, the boost in economic performance in the region is explained by a growing capacity of the economies to create more jobs and to a less extent by a jumpstart in productivity (Alaimo et al., 2015). In fact, the dynamism in employment rates can even explain on average 60% of the changes in the GDP per capita in the Andean region, compared to only 40% from productivity gains. Interestingly, Colombia and Peru show considerable better productivity contributions of over 50% while the growth in employment in Venezuela and Bolivia explain the overall growth and can even compensate for the losses in productivity in the case of Venezuela (Figure 1e).

Despite progress in the labor market, the tailwinds from the commodity boom were insufficient to jumpstart formality rates (figure 1f) as employment has moved towards activities subject to lower salaries or with limited benefits that have commonly being circumscribed within the informal sector.

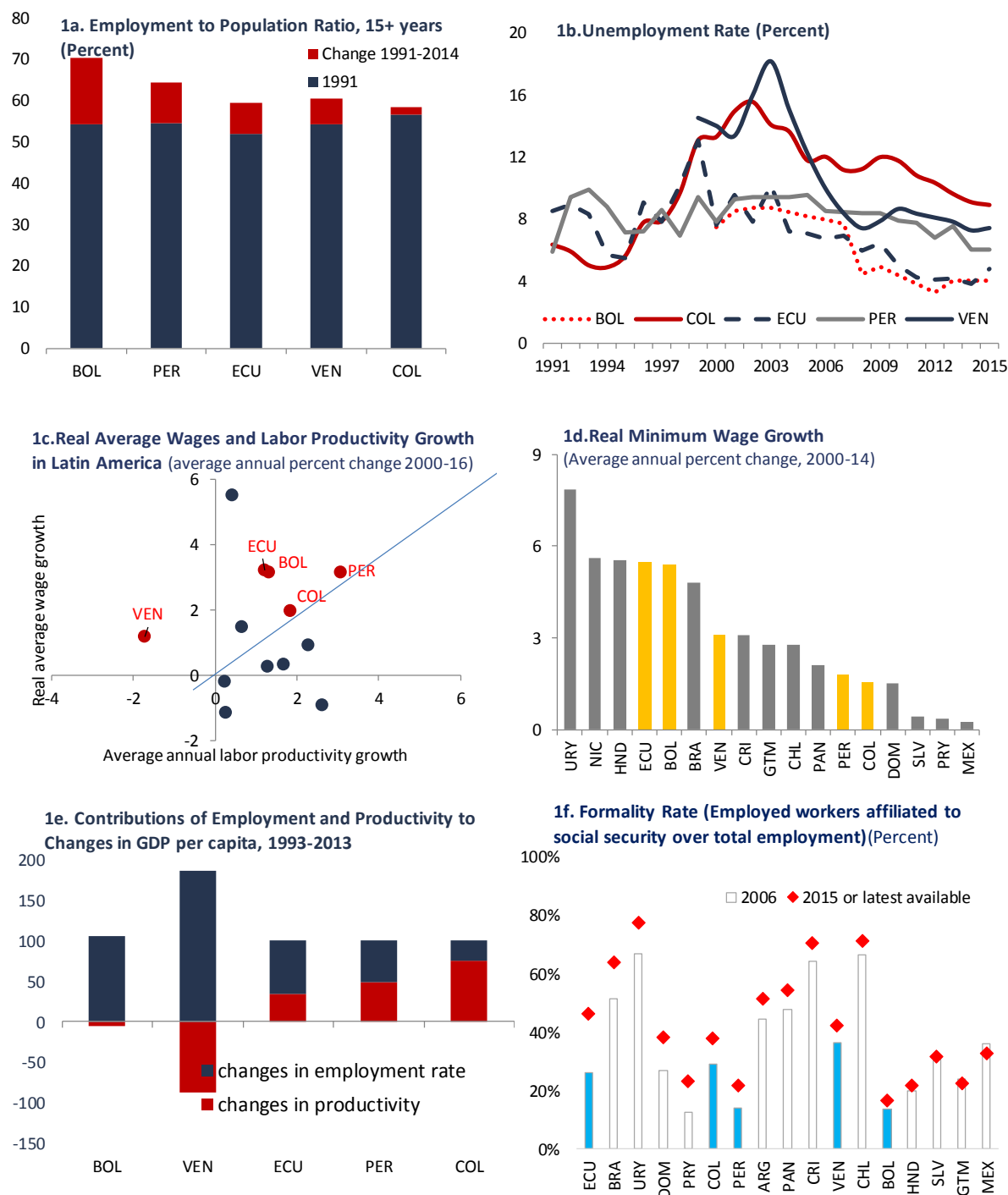
Internal and external factors are behind the low incidence of formality rates in the region. On the internal aspects, Alaimo et al. (2015) considers high wage and non-wage costs relative to productivity as one important internal aspect as they can oscillate between 10% to 100% of labor productivity and countries constrained by the highest rates show lower formality rates. Additionally, the quality of the company related to the technology and capital that it uses, and the quality of its employee based on skills, can also affect formality outcomes in the country. On the external side, the business environment and the quality of the infrastructure can also trigger down the formalization process by limiting access of products to main markets, constraining the expansion of business, or either by beneficiating weak performer companies.

Asymmetric information between job hunters and the available vacancies in the market also play a role in slowing down formality. On the employer's side, the unknown paradigm on how efficiently and fast they could hire an employee combined with higher hiring and severance costs can deteriorate the pairing process between employees and employers and result in lower vacancies in the market. On the employee side, the low usage of formal channels to advertise vacancies makes it difficult for employees to find jobs and perpetuates the vicious circle in which informal workers, given its network around informality, impede them to have access to available formal vacancies in the market (Alaimo et al., 2015). Albeit these restrictions, Latin America's labor market is characterized by a faster pace at which unemployed workers are hired, as 50% of

³ Andean countries refer to Venezuela, Colombia, Bolivia, Perú and Ecuador.

Figure 1. Labor Markets in the Andean Region

Figure 1. Labor Markets in the Andean Region



Source: Author's calculations using data from: (1a) World Development Indicators, (1b) World Economic Outlook, (1c) Conference Board y Sistema de Indicadores de Mercado Laboral y Seguridad Social (SIMS), (1d) SIMS y World Economic Outlook, (1e) Alaimo, et al., (2015), SIMS y Conference Board, (1f) SIMS.

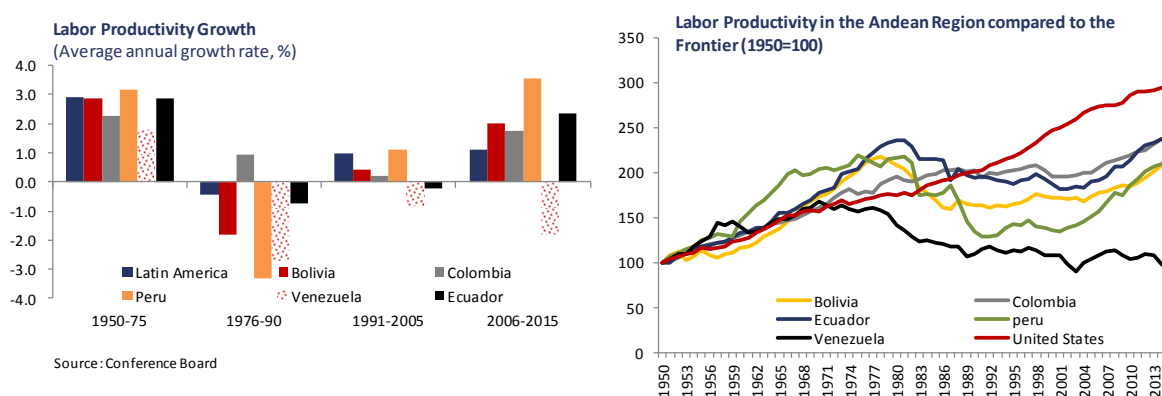
the unemployed find a job contrary to OECD workers where the rate is lower (around 20%). However, only 30% of unemployed workers that find a job fill a vacancy with a formal contract as employees may face significant constraints to stay unemployed for prolonged periods of time pushing them to rapidly accept informal jobs.

Despite the higher concentration of jobs among the informal sector, Latin America does not create nor destroy more formal jobs than other regions, instead, employees move around them more frequently (Alaimo et al., 2015). The issues associated with the high rotation of workers combined with elevated wage and non-wage salaries perpetuate the low levels of salaried workers and encourage the rise of self-employment as a mechanism to cope with the lack of formal jobs.

The dynamism in the labor market, observed during the commodity cycle, have not either been accompanied by progress in formality rates nor by improvements in the quality of employment as productivity remains low, giving signals that most of the job creation is of low quality, subject to lower benefits, and not taking place among medium and big size companies where higher productivity gains are expected (Pagés et al., 2009).

After decades of similar labor productivity growth among the Andean region and Latin America, Andean countries suffered more losses in productivity during the “lost decade” and hardly recovered in the 90’s and early 2000’s. It has been since the commodity boom that we observe more dynamic productivity gains in the region even higher than the ones observed in Latin America, except for Venezuela where efficiency has been on a downward spiral. Albeit this recent dynamism in productivity, aggregate levels remain low in comparison to the frontier (United States) (See Figure 2).

Figure 2. Evolution of Labor Productivity in the Andean Region



Many factors are behind the sluggish behavior in productivity. From weak investment and the spread of less productive sectors to lack of innovation and inefficient allocation of resources within and across sectors (Haltiwanger, 2012) have somehow harmed the speed at which the productivity catches up with the frontier. Factors intrinsically related to the firms also play a role in the low productivity of the region where one part could relate to the education and experience of the management team, the quality of the inputs (from quality and experience of the employees to the aging of the capital), the capacity of companies to absorb new technologies or innovating

in processes or products and the other part is related to the possibilities of the firms to access factors of productions easily and to place products in markets in such a way that fosters competition in the market creating pressures for those less productive firms to exit the market (World Bank, 2015 and Alaimo et al., 2015).

The general picture of a region characterized by low productivity and a slow catching up process to the frontier coupled with a buoyant employment creation, wage rises but scarce formalization and high rotation of workers across jobs, present both challenges for individuals to find jobs that provide stable labor conditions for them and for companies to grow. Self-employment⁴ appears for many job hunters as a way to cope with the lack of formal jobs, but can also be an option to enjoy pecuniary and non-pecuniary benefits. However, the emergence of a labor market with a sizable self-employment segment also drags down efficiency outcomes by preserving the vicious circle of inefficient use of factors of production, low company growth, and scarce creation of formal jobs perpetuating the cycle of low productivity in the region.

This research looks at the possible channels in which self-employment can be harming productivity outcomes in the region. At par, it also goes beyond those links and tries to uncover the motivations that incentive workers to opt for self-employment either by the advantage of being your own boss or by the lack of jobs with better benefits. We estimate quantile regressions with the purpose of identifying those motivations in such a way that we can distinguish whether there is a monetary income premium for those at self-employment compared to wage earners at different levels of income. Our estimations will be useful to uncover whether pecuniary benefits or lack of available jobs for those workers are the ones fostering self-employment in the region.

This paper is divided as follows. Section II looks at the possible channels in which self-employment can harm productivity outcomes in the Andean region. Section III explains the motivations that incentive workers to opt for self-employment and the methodology that we used for our estimations. Section IV presents the results of the quantile regressions. Section V concludes.

2. Productivity and the self-employed

Several factors are behind the sluggish behavior in efficiency among businesses. Among these factors we find the low productivity of micro-firms representing the biggest sector in the region, high concentration of micro-enterprises in the service sector with very low productivity outcomes, lack of innovation among small and medium size firms, misallocation of resources within the same sector and credit constraints preventing companies to grow (Pagés (ed), 2010). In this paper, we will focus on the first two factors, high concentration of microenterprises and a growing reliance of the economies on the service sector where the vast majority of self-employed workers are located and where productivity is on a downward spiral. These factors will shed some light on the relevance of self-employment to explain the slow advancement of the Andean countries towards the frontier of productivity.

⁴ The International Labor Organization in the International Standard Classification of Status in Employment (ICSE-93) defines self-employment as the total of 4 categories, (i) employers, (ii) own-account workers, (iii) member of producer's cooperatives and (iv) family workers.

2.1 Micro-enterprises

Traditionally lower income economies show a high concentration of workers among agriculture or unpaid labor. As income rises, workers moved out of these activities to cities where self-employment tends to expand as an alternative to make a living. Further increases in the level of development, push employees out of self-employment towards wage jobs coupled with a slight rise in employer rates and declining agricultural workers (Lederman et. al., 2014). Intrinsic characteristics of the firms created in the market could explain why, albeit Latin America has moved out of agricultural activities and unpaid jobs towards salaried employment, the region has been unsuccessful at creating a robust salaried employment mass.

In this sense, there are three issues related to the firms in the region that not only can bind the rise of a salaried workforce but also undermine the productivity of the region. One factor relates to the high concentration of micro-firms that account for a larger share of the employment, the second focus on the low productivity of those micro-firms, and the third one looks at the wide dispersion in productivity across firms. We will briefly discuss each of these points in the following segments.

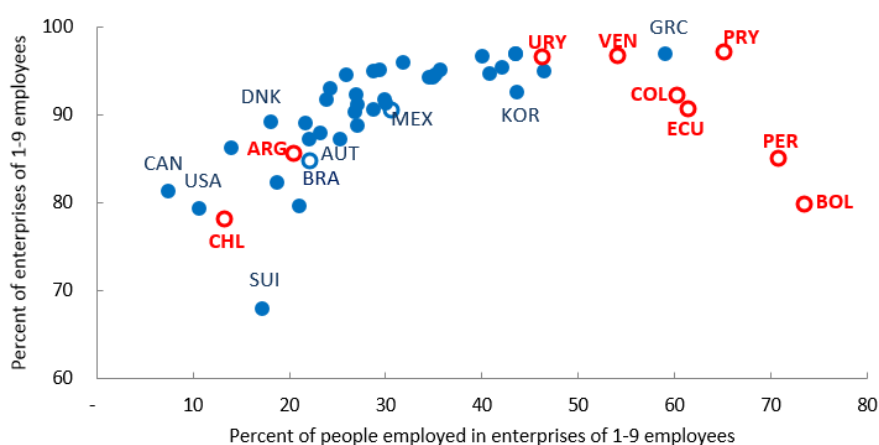
2.1.1 Many micro-enterprises⁵

A vigorous concentration of micro-enterprises in the Andean region of around 90% of the market is not very different to what we observe among OECD countries where they represent, in the overall, more than 80% of the total. The wide difference among both blocks of countries focuses on the ability of OECD economies to concentrate most of the employment among medium and big size firms, contrary to Andean countries where micro-firms withhold more than 50% of the employment couple with a low quality of those jobs due to both high concentration among informal⁶ workers and the elevated rotation of employees from one job to another that prevents increases in human capital accumulation and efficiency gains (see figure 3).

⁵ In OECD (2016) micro-enterprises refer to companies of 1-9 employees.

⁶ For the purpose of this paper, informality is defined as workers without social security benefits.

Figure 3. Employment and Size of Micro-enterprises in the Market



Note: Blue dots refer to OECD countries. Red dots refer to select LAC countries.

Source: Entrepreneurship at a Glance 2016, OECD., for OECD countries. For the andean region we use the following sources:

PER: INEI, and Ministerio de la Produccion. (2015). Anuario Estadístico Industrial, Mypyme y Comercio Interno (Refers to companies micro and small companies of 1-10 employees).

COL: SIMS and Confecamaras (2016). Nacimiento y Supervivencia de las Empresas Colombianas.

ECU: SIMS and INEC Directorio de Empresas y Establecimientos 2015.

VEN: INE, Censo Economico 2007-08 (Data refers to companies of 1-20 employees)

BOL: SIMS, and Fundamempresa. (Data refers to unipersonal enterprises as percent of total enterprises which might be overestimating the component of small firms among the total)

ARG: Ministerio de Trabajo, Empleo y Seguridad Social. Data refers to 2015 and includes companies with up to 9 employees.

CHL: Servicio de Impuestos Internos, Departamento de Estudios Económicos y Tributarios (2016). Data refers to companies without sales, micro 1, micro 2, and micro 3. Micro refers to companies with sales below UF2400.

PRY: Dirección General de Estadística, Encuestas y Censos del Paraguay. Data on enterprises refers to 1-50 employees for 2010. Data on employment refers to 1-50 employees for 2016.

URY: Instituto Nacional de Estadística. Data refers to companies between 1-19 employees in 2016.

Despite the issues related to the insufficiencies to create jobs by the big and medium size companies, a market underpinned by micro-enterprises also suffers of mediocre growth that preclude companies to quickly catch up with the growth path of the benchmarks (Lederman et. al, 2014). Companies, in general, remain small making difficult to gain better employment prospects for the working population, enhance human capital accumulation or boost productivity. Additionally, company entry levels remain below the level of development suggesting entry barriers might be binding access to the market, harming competitiveness and productivity as well.

In parallel to growth and entry issues, distinctions between the size and age of companies are also important for job creation prospects and the boost of productivity. In this regard, Haltiwanger, Jamin and Miranda (2010) showed for the United States that a negative relationship between net job creation and firm size exists but it dissipates once they control for firm's age suggesting that small business could be associated with employment creation, but more than small companies are young firms the ones driving job formation. It is also expected that companies that did not grow when they were young are less likely to accelerate their growth trend at old ages (Eslava, and Haltiwanger, 2012)

Differences between the growth rates of the young firms at various sizes are smaller than the gap between young and older companies giving signs of the importance of those young firms to boost employment, output and productivity outcomes. Beyond this argument, Eslava, and Haltiwanger (2012) also point to the distinctions among those young small firms at the upper tail of the growth distribution that can be powerful at explaining differences across countries as follows. First, although she finds employment and output growth in Colombia are driven by young continuing firms, is actually those at the upper tail (90th percentile) the ones with the highest growth while the bottom (10th percentile) show contractions. Second, the growth decline across ages is also driven by a falling path of those firms at the top and the median while the bottom of the distribution maintains a constant negative behavior across ages. Third, these declining trends in employment and production across ages for the top and median of the distribution are also observed for small, medium and large companies. Fourth, productivity is neither the exception to the above trend as those young firms at the upper tail are highly efficient compared to the lower part of the distribution, but its efficiency starts to unwind with age.

Similar behavior of heterogeneous young firms is observed in the US. For this benchmark, a pattern called by Haltiwanger (2012) as “up or out” dynamics, in which younger firms either grow while providing faster employment creation rates or die while destroying higher amounts of jobs in those less successful businesses. Aside of employment, productivity outcomes are also affected by these dynamics, as exiting companies typically have lower productivity outcomes while continuing young firms are pushing the boundaries by having above average efficiencies that in general are 3% above mature firms and remain above 1% after 5 years in the market (Haltiwanger, 2012). Firm’s dynamism among micro and small firms is less robust in emerging markets than in advanced economies and the contribution from those companies to aggregate productivity is very much scarce making up for a market of abundant mice, few elephants and insufficient gazelles that constraints the progress towards higher productivity outcomes.⁷ (Li and Rama, 2015)

Another point about growth prospect among small and micro firms relates to the intentions of those owners to remain small. Two factors support this claim, (i) the business cost structure of their companies, and (ii) the non-pecuniary benefits enjoyed by the owners. The former relates to companies facing low returns to scale for expanding their business, as fixed costs relative to variable costs are small, influencing owner’s decision to keep their businesses at a small scale. The latter, on the other hand, refers to the preference of owners to preserve higher utility levels at the expenses of potential benefits that larger firms could offer them (Hurst and Wild, 2011).

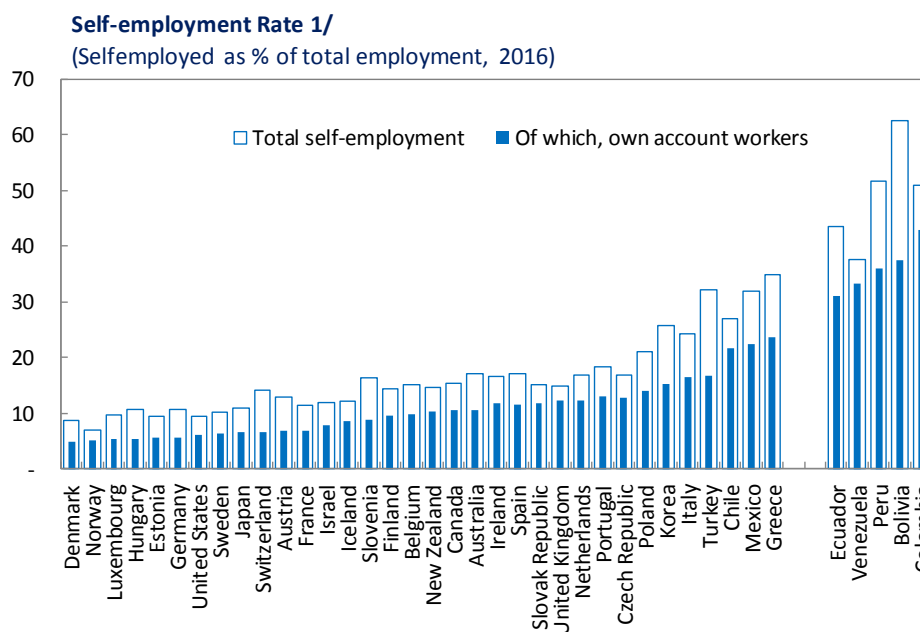
The firm’s landscape of abundant micro-firms, weak employment prospects provided by big and medium size companies, slow growth of firms, high productivity for young firms for those at the top of the income distribution that unwinds with time, brings us to acknowledge the importance of understanding how micro-enterprises can also be a factor behind the deficiencies in the firm’s market in the region.

Employment is divided among wage earners and self-employed workers, of which the International Labor Organization sub-categorized into (i) employers, (ii) own-account workers, (iii)

⁷ Mice firms refer to small firms that do not grow, while gazelles are those rapidly rising firms. Elephant firms are conceived as those companies, although bigger in size, tend to be stagnant (Li, Y., Rama, M. 2015)

members of cooperatives, and (iv) family workers. Self-employment represents the biggest source of employment among Andean countries oscillating around 40% to 65% of the market, compared to OECD members where the median is around 15%. Giving that own-account workers are the bulk of self-employment, they turn to be the most important component in the labor market (see figure 4). Knowing how this market behaves and what factors motivate individuals to enter this market can shed some light on better policies to foster productivity and employment gains in the Andean region.

Figure 4. Self-employment and Own-account Workers in OECD and CAN Countries



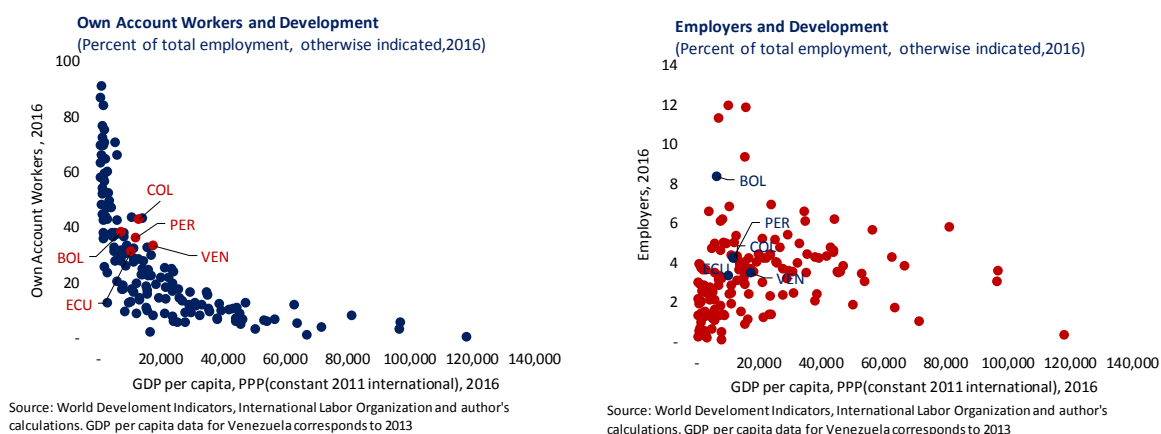
Source: International Labor Organization and author's calculations.

1/ The International Labor Organization in the International Standard Classification of Status in Employment (ICSE-93) defines self-employment as the total of 4 categories, (i) employers, (ii) own-account workers, (iii) member of producer's cooperatives and (iv) family workers.

Self-employment could be considered as an important alternative to wage employment, mainly for those at the low ability distribution, also known as low-growth potential entrepreneurs, as their capacity to afford longer periods of time without a job is limited. In accordance to the main objective of this paper, self-employment can also be motivated by income differentials obtained from salaried jobs versus gains from entrepreneurship. When income perceived from self-employment is higher than earnings from dependent employment, self-employment emerges as an option to wage employment that could turn self-employment from a temporal choice to a permanent one to make a living (Lederman, 2014).

The problem associated with the proliferation of business among the lowest levels of income, where low-growth potential entrepreneurs are commonly located, is that more than showing an entrepreneur behavior of our economies can also be a sign of a deficient economy incapable of creating better options for them (Banerjee and Duflo, 2011). In this context, Andean countries could be identified as an entrepreneur region as most the employer rate is somehow in line to what is predicted for the level of development but the region fails at providing enough jobs for the labor force as the rate of own-account workers is above the level of development (Figure 5).

Figure 5. Own-account Workers and Employers Rate Vs. Level of Development



The fact that the region relies on own-account workers for the bulk of employment, above of what is predicted for the level of development, and where medium and big size companies are far from retaining a large part of the labor force is a symptom of the strong deficiencies of the labor market that constraints the progress of formalization, access to better quality jobs and the boost of productivity.

2.1.2 Low productivity of micro-firms

A positive relationship between size of the firm and productivity is expected (Eslava, and Haltiwanger, 2012; World Bank 2012), although this link is weaker for developing countries (Li and Ram. 2015; Alaimo et al., 2015) and even more for economies with less robust market mechanisms (Li and Rama, 2015).

On one hand, larger and medium size firms tend to innovate more in products and processes, and are more likely to export and to invest in research and development supporting efficiency. Nonetheless, Latin American firms lag in innovation outcomes compared to other countries. The innovation gap is persistently independent of the size of the company even for those superstar enterprises or multinationals (Lederman, 2014), and the scarcity of medium and high levels of productivity among firms coupled with an elevated proportion of small companies, in particular self-employed workers, makes difficult for productivity to gain momentum (Pagés (ed.), 2010). It is estimated by Pagés (ed.) (2010) that by having the same proportion of medium and high productive firms in Latin America compared to the frontier, productivity and GDP outcomes would double, and by supporting the weak, small and less efficient firms, it would be more difficult to raise aggregate productivity.

On the other hand, the low achievements in productivity by small firms are explained by the lack of experience of workers, absence of innovation, capital modernization lags, slow process to beneficiate from scale economies, credit constraints, lack of training and quality certifications, and informality of contracts, while owner's education and experience, although not related to efficiency, tend to be higher for larger firms (Alvarez and Crespi, 2003; Ibararán, Maffioli, and Stucchi, 2009). All the above factors improved as companies get bigger, however, capital to labor

ratios are similar across different firm's sizes, signaling the importance of human capital and managerial skills to explain differences in firm's performance⁸ (Alvarez and Crespi, 2003).

It is also important to notice that albeit there is similar capital to labor ratios across firms, there is a problem of misallocation of resources that also harms aggregate productivity. A better use of labor and capital across existent firms could jumpstart both productivity and the regional GDP by 40% to 60%⁹ (Pagés (ed.), 2010) by using current technologies. In this sense, marginal changes can produce big transformations in countries like the ones in the Andean region. Aside from a better allocation of resources, productivity could also improve by progress in industry dynamics, that refers to the entry and exit of firms, in which companies entering the market displaced those less productive in a process often called "creative destruction", that boosts aggregate productivity growth and is considered a micro determinant of improvements in productivity, that later results on economic growth (Lederman, 2014). In this regard, Tybout (1996) (as cited in Li and Rama, 2015) found that companies exiting the market in Chile tend to be less productive than those remaining while new firms entering the market catch up with the average productivity of the industry after 3 or 4 years of functioning in the case of Colombia. In Taiwan, Aw, Chen, and Roberts (2001) (as cited in Li and Rama, 2015) found industry dynamics can explain half of the productivity growth in the manufacturing sector where exiting firms also tend to have lower productivity outcomes and new firms, although have lower productivity than existing ones, converge to the average productivity level or dye. In general, the contribution of reallocation of factors to productivity growth is smaller than gains from industry dynamics for both advanced and developing economies, but evidence of churning (simultaneous entry and exit of firms in the market) tend to mitigate productivity improvements (Li and Rama, 2015).

Differences in economic growth around countries of the region are explained by low productivity outcomes. In general, the region is one with abundant micro firms that characterized the market, hold the majority of workers, produce a small section of the total production, and perform below average productivity levels. Therein the relationship between the size of firms and productivity outcomes is one of relevance for the region but also the policies in place for supporting micro, small and medium size firms, and the policy failures that delay the takeoff of productivity outcomes.

Policies oriented towards micro, small and medium enterprises can affect productivity outcomes by either directly targeting those companies or by reallocating resources between them and large companies (Ibarrarán, Maffioli, and Stucchi, 2009) where productivity outcomes tend to be higher. Several failures could restrict the potential positive effects of these policies on productivity. On one hand, by favoring policies towards micro, small and medium size businesses when larger companies are more productive could introduce distortions in the market by reallocating resources towards less efficient uses (Eslava and Haltiwanger, 2012)¹⁰. On the other hand, market and policy failures could foster the participation in the market of less efficient companies or prevent the development of more productive ones (Pagés (ed.), 2010). Additionally to policy failures on micro, small and medium firms, the existence of poor institutions can also trigger inefficiencies in

⁸ In the case of the manufacturing sector in Chile.

⁹ Results could vary by country.

¹⁰ Eslava and Haltiwanger (2012) also consider that policies towards SME could be helpful when they "offset an existing market failure disproportionately impacting small business".

the market by giving advantage to larger and less efficient companies that are well connected, know how to take advantage of the deficiencies of the system or by creating barriers to entry or grow for those firms with better productivity prospects (Haltiwanger, 2012).

Several factors are behind the sluggish productivity outcomes of micro and small firms, from low quality of labor and capital, credit constraints and informality to misallocation of resources and deficient industry dynamics in the firm's market. At par, the failure of policies targeting them by exacerbating distortions in the allocation of resources from more productive uses to less productive ones, by preserving inefficient companies in the market in combination with inadequate institutions to foster competition, can perpetuate the vicious circle of low productivity firms and scarce dynamic medium and big size companies that are unable to boost a salaried mass that offers options to self-employment.

2.1.3 Wide dispersion in productivity across firms

A wider variability in productivity across firms within the same industry in Latin America also deteriorates aggregate efficiency. Particularly for the manufacturing sector in the Andean region, the dispersion in productivity between the 90th and 10th percentile is around 300% for Ecuador and Bolivia and around 500% for Venezuela and Colombia (Pagés (ed.), 2010)¹¹. The productivity gap is extensive and clearly shows that the use of resources is very inefficient among the low part of the distribution and even worst, most of the gap relies between the median and the 10th percentile where a little bit more than 50% of the total dispersion in Ecuador, Bolivia and Venezuela is concentrated, showing that those at the bottom of the distribution, usually small firms and self-employed workers, are even more unproductive and also dragging down aggregate productivity.

However, the heterogeneity of productivity among firms within same sectors is also a common feature in advanced economies. In the US, using different measures of total factor productivity (TFP), Syverson (2004) (as cited in Li and Rama, 2015) has found a bigger gap among the 90th and 10th percentile of the distribution. Similar conclusions are gathered for France, Germany, Netherlands and the UK. In general, the dispersion in advanced economies is closer than what is observed in our region. Worryingly within country productivity dispersions are far more pronounced than the gap among rich and poor countries (Banerjee, and Duflo, 2005).

This enormous heterogeneity also implies that there are some top performers that in some cases are at par of companies in the same sector at the frontier of productivity (Pagés (ed.), 2010). By increasing the productivity of less productive companies or by changing the size structure of the market, we can notably improve productivity outcomes. It is estimated that by keeping productivity unchanged and altering the ratios of small, medium and bigger companies in the total as the ones kept in the United States, productivity will jump 90% to 120% in some countries¹² (Pagés (ed.), 2010) while improvements in productivity by those at the lower level of productivity would only account for small gains. Therefore, policies oriented to boost productivity among all types of firms will have different results and will perhaps be less successful than those focusing on developing the most productive firms.

¹¹ Data corresponds to companies with more than 10 employees.

¹² The exercise relies on calculations for El Salvador and Mexico.

Several factors could be behind the wider heterogeneity of productivity outcomes in the region. Within company differences in processes, technologies, and human capital and deficient managerial skills could explain the larger dispersion (Pagés (ed.), 2010). The gap is also a sign of inefficient allocation of resources across companies in which some firms, given the same set of inputs within industries, can produce more goods. Factor misallocation problems could be based on market and structural deficiencies like poor competition, labor market rigidities, limited access to credit, elevated tax burden on firms, biased on enforcement of the law, and difficulties finding appropriate managerial skills that support the movement of resources to more productive firms (Pagés (ed.), 2010; World Bank, 2015).

It is estimated that aggregate productivity could increase by 50% to 60% in the region given a better reallocation of labor and capital between manufacturing firms (Pagés (ed.), 2010). Improvements in factor misallocations would help to close the gap with respect to the United States. However, a close look at the dispersions in productivity among sectors compared to the benchmarked indicate the manufacturing gap is narrowed and lower than 50%. The big gap in aggregate productivity points out to other sectors, namely the service sector, as one of the lagging segments of the market in which a better factor reallocation could help to boost efficiency in the region.

Several issues affect firm's dynamics in the region and consequently reallocation. From a high concentration of new enterprises among low technology industries, to creative destruction happening within micro and small businesses, productivity enhancements and gains from reallocation tend to be narrowed. The low technology and size of the firms also constraints the capacity of the new firms to generate strong competence among existing companies reducing the chances of more dynamic industries (Pagés, Gaëlle and Scarpetta, 2009) able to boost aggregate productivity. Acknowledging these constraints in the firm's market, we could argue for the need to promote transformational entrepreneurship that can foster economic growth and job creation. A positive relationship between net entries of entrepreneurs and job creation is only expected once we discount self-employment without employees and informal companies out of the sample in developing countries (Lederman, 2014). Therefore, the need to recognize the limitations that own account workers and informality pose for the takeoff of employment, growth and productivity in the region.

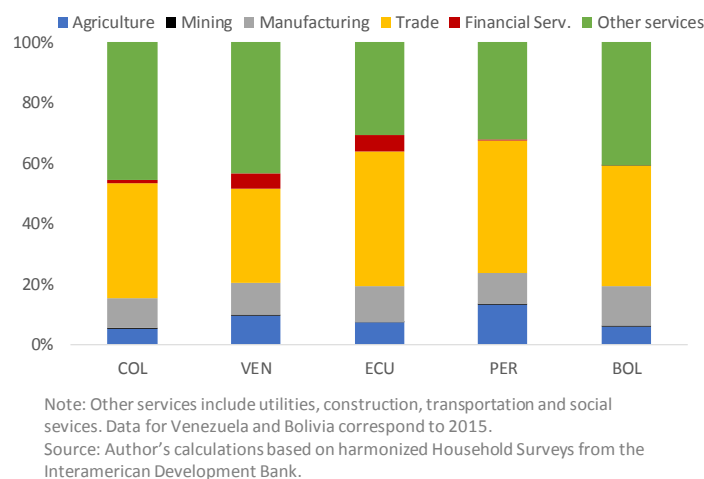
2.2 Self-employment and the service sector

Among self-employed workers, the bulk of employment is concentrated in the service sector¹³ for Colombia and Venezuela and it is the second most important source of jobs after trade in Bolivia, Ecuador and Peru (Figure 6). This high concentration of labor in services is part of the structural transformation of the economies in which the reallocation of employment moves from agricultural activities to the industry sector and that later moves towards services. As productivity increases in the agricultural sector due to technological changes coupled with a lower proportion of income spent in basic goods compared to manufacturing and services goods once income rises, the sector can absorb the losses in employment and provide the goods for consumption. Meanwhile, workers reallocate towards an industry sector subjected to an increasing demand for manufactured goods and where efficiency is higher than in agriculture, resulting in a boost to

¹³ Service sector includes utilities, construction, transportation, and social services.

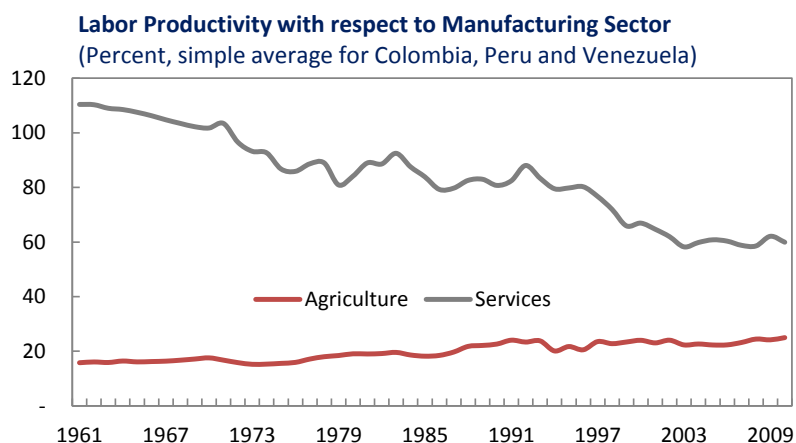
aggregate productivity by a better reallocation of resources. Further in the development process, increases in productivity in the industry sector push workers out of the sector towards services. In this process, expansions in aggregate productivity will be driven by how efficient the service sector is compared to the industry sector (Pagés(ed.), 2010).

Figure 6. Self-employment by sector, 2016



Nowadays we observe a timid convergence of agriculture productivity to industry levels and a lagging service sector where productivity has been going on a downward spiral. Despite the slow convergence in agriculture, the gap is still wide and far from closing. On the contrary, in the service sector we observe a deterioration of the efficiency compared to the industry in the early 1970's when productivity in both sectors was the same. In terms of reallocation of workers from agriculture towards manufacturing and from manufacturing towards services before 1970's, we could imply shifts were efficient as productivity kept rising, but the reallocation of labor has been less successful afterwards as a growing service sector coupled with poor efficiency is dragging down productivity in the Andean region (figure 7).

Figure 7. Labor Productivity in the Andean Region by Sector



Source: Author's calculations based on M.P. Timmer, G.J. de Vries, and K. de Vries (2014).
Note: Services refers to labor productivity average of trade, transportation, financial, government and social services.

This process of structural transformation, common to developing economies in its path to development, has been faster than usual in Latin America than in Asia that somehow could explain the lower efficiency gains reached in some sectors, in specific services. In terms of employment, labor in agriculture has been on a downward trend coupled with fewer employees in the industry sector compared to Asia, in what it would seem that the region is in a faster track of the structural transformation. However, the proportion of jobs in the industry sector is statistically lower in Latin American than in Asia at their level of development, especially in the 70's and 80's (Pagés, Pierre and Scarpetta, 2009) arguing the region has bypassed the industry stage of the structural transformation at a higher speed hitting productivity outcomes in its way.

There are differences in the speed at which countries have moved in the structural transformation in the region. Colombia, Bolivia and Peru still have a larger percent of population in agriculture where improvements in efficiency and labor reallocation towards other sectors could benefit aggregate productivity. Venezuela on the other hand, has a very small agriculture sector coupled with a proportion of labor in services like what is observed in advanced economies but subject to lower productivity outcomes. Therefore, the region can further benefit from a better reallocation of factors towards higher productivity sectors.

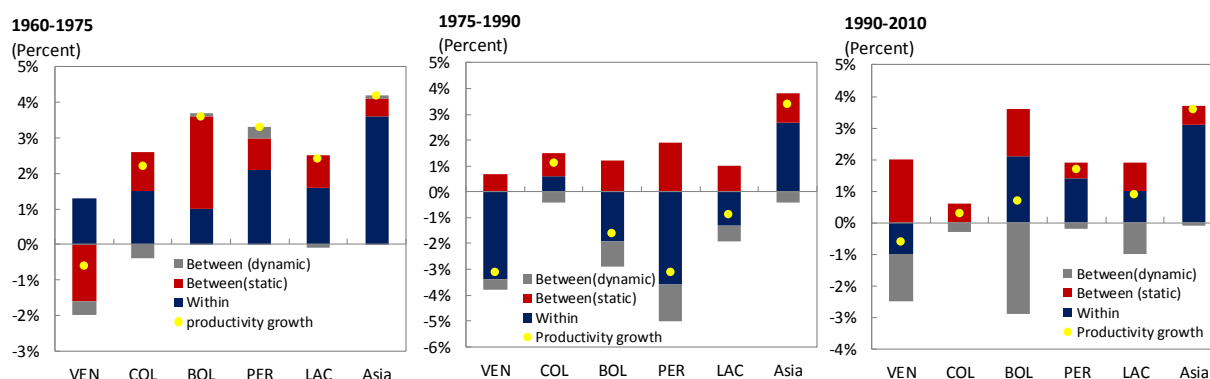
Given aggregate productivity is driven by sector productivity and employment shares, productivity within the sector and the reallocation of labor between sectors also play an important role to explain the growth of efficiency. On one hand, within sector productivity explains a larger proportion of productivity growth before the 1970's (within productivity¹⁴) at par with labor reallocation from less productive to more productive sectors (between-static productivity¹⁵). In recent years, we observed a change in this trend as the contribution of labor reallocation (between-static) have slightly dissipated and in turn most of the gains are mainly explained by improvements within sectors. Interestingly, dynamic reallocation (between-dynamic¹⁶) has been dragging down aggregate productivity in the last period. Andean countries' productivity has gained some momentum by reallocating labor towards sectors with above average productivity levels (static reallocation) but has lost some of those gains as people moved towards sectors where productivity growth is below average (dynamic reallocation) (figure 8). Asia, on the other side, has remarkably boosted within sector productivity across time, giving them the advantage of creating robust sectors.

¹⁴ Refers to the growth in aggregate productivity due to changes in sectorial productivity multiplied by the share of employees in the sector at the beginning of the period.

¹⁵ Refers to the growth in aggregate productivity due to changes in the allocation of employment from less to more productive sectors multiplied by the productivity of each sector at the beginning of the period.

¹⁶ Refers to both changes in employment shares and productivity.

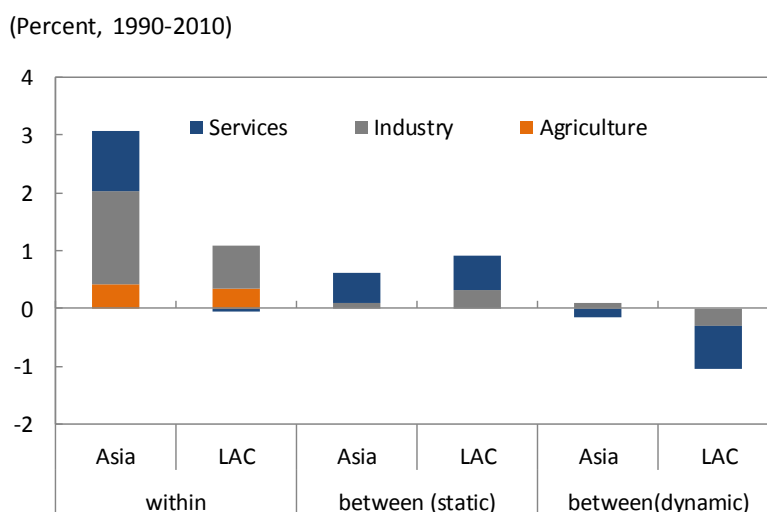
Figure 8. Decomposition of labor productivity growth



Source: Timmer, M. P., de Vries, G. J., & de Vries, K. (2015). "Patterns of Structural Change in Developing Countries." In J. Weiss, & M. Tribe (Eds.), *Routledge Handbook of Industry and Development*. (pp. 65-83). Routledge.

A look at the contributions by sector to total productivity shows industry as the motor of productivity growth for both Asia and Latin America, with the biggest components coming from improvements within the manufacturing sector itself. On the contrary, the service sector is dragging down productivity by a small within sector productivity in Latin America that is only helping to the boost by absorbing higher employment shares. Interestingly the dynamic reallocation is far worse than what is observed in Asia, suggesting the lagging performance of the marginal productivity of workers in services is dragging down aggregate productivity more severely in the region (figure 9).

Figure 9. Decomposition of Labor Productivity Growth by Region and Sector



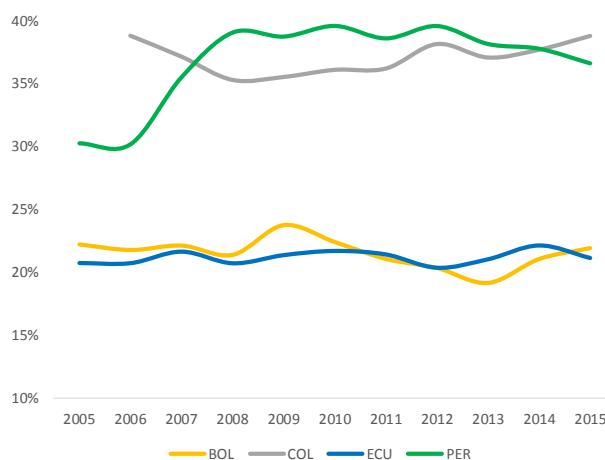
Source: Timmer, M. P., de Vries, G. J., & de Vries, K. (2015).

The slow productivity of the service sector can be linked to a growing movement of employees towards the sector, in which a lower entering cost coupled with lack of formal jobs incentive people to enter the market by creating their own way of living. In turn, the low productivity of those self-employed worker that innovate little, provide scarce training, and face credit constraints is a trigger

to harm the aggregate productivity of the sector. They are also tilted to the informal sector creating fewer incentives for more productive firms to enter the market aggravating salaries and working conditions for the sector (Pagés(ed.), 2010). The problem behind a lagging service sector also goes beyond the productivity within the sector as it affects the development of other activities. For instance, transportation, trade and communications can help agriculture and industrial activities to take a boost, but their inefficiencies can also affect their productivity outcomes.

Additionally, to low levels of productivity in services, the Andean region faces the challenge of high rotation of workers and the wider variability of productivity among firms that is even higher for the service sector. On one hand, the elevated rotation aggravates human capital accumulations within firms in further detriment of labor productivity. Around 1 in 3 workers in Peru and Colombia and around 1 in 5 in Ecuador and Bolivia have being employed for less than 1 year in their current jobs compared to 1 in 6 in the US and 1 in 8 in the OECD (Alaimo et al., 2015). Meanwhile productivity levels remain unchanged in the last few years suggesting the reallocation of workers from some jobs to others have not improved the efficiency of the market.

Figure 10. Job Duration less than 1 Year (% of Workers)



Source: SIMS.

On the other hand, the bigger variability of productivity between the 90th and 10th percentile is even higher for the service sector, characterized by a larger fraction of self-employed and micro firms, than the manufacturing sector. The combination of high dispersion and niches of the market in micro-enterprises, mainly in services, that have not been notably shrinking even though the economies have moved from lower to higher levels of income can explain why productivity gains have been converging slowly to the frontier in the last few years.

The labor market is therefore constrained to a segment characterized by low levels of productivity, mainly concentrated in the service sector, with high rotation of workers, lack of human capital accumulation, insufficient or absent innovation and credit access constraints. The combination of these factors combined with high hiring costs of around 39% of GDP per worker on average in Latin America (Alaimo, et al., 2015) affects the capacity of the labor market to create higher quality jobs in the formal sector more dynamically and to boost aggregate productivity.

3. Self-employed motivations

Self-employment rates can vary across countries due to various macroeconomic reasons such as the level of development of the country, biased technological changes, shifts in industry composition in which economies moves from agricultural products, low scale firms and high self-employment towards a manufacturing sector that expands firms and markets, is labor intensive and where the returns to self-employment diminish, demographic changes, high unemployment rates, and cultural factors (Zoltán, Audretsc and Evans, 1994).

At the individual level, Bennet and Rablen (2012) remark that urban labor markets in developing economies -such as those in the Andean region- exhibit considerable diversity, typically including segments of both voluntary and involuntary self-employment, as well as formal and informal wage employment. In unison, Dawson, Henley and Latreille (2009) explain that a substantial body of research investigates the self-employed as entrepreneurs, using self-employment as an observable category which, albeit imperfectly, identifies the stock of entrepreneurial talent in a given economy, but in contrast, self-employment may also comprise a far less desirable state chosen reluctantly by individuals unable to find appropriate paid employment under current labor conditions. The latest could be the case for most of the Andean countries' workers, where self-employment may be chosen as the only available alternative to unemployment. Indeed, in many developing economies, self-employment may be viewed as a form of informal sector employment activity.

We aim at identifying the reasons behind the high concentration of self-employment in the region in a way that is useful to understand the challenges to boost productivity in the short run. To do so, we estimate whether self-employed workers have a monetary premium that will incentive them to remain self-employed instead of being wage workers. Positive earning differentials will indicate self-employed workers are better off in self-employment while negative earning differentials would suggest they will have higher monetary incomes moving to wage paid jobs. A negative premium could also indicate structural problems in the labor market that precluded self-employed workers from being able to find paid jobs.

For the specific case of the Andean region, we can expect a wide heterogeneity within the workers classified as self-employed, where some may correspond to highly productive workers who have strong incentives to become *entrepreneurs* while others are pushed into self-employment as the only alternative in the absence of opportunities to get a paid job in the formal labor market. This high heterogeneity poses methodological challenges for estimating income differences between these different clusters of workers, issue that can be overcome by using quantile regressions as these estimations can be useful to assess differences across income levels.

3.1 Model implementation by quantile regressions

Roger Koenker and Hallock (2001) state that there has been a rapidly expanding empirical quantile regression literature in economics that makes a persuasive case for the value of "going beyond models for the conditional mean" in empirical economics, where there has been considerable work in labor economics, e.g. on union wage effects, returns to education and labor market discrimination.

Quantile regression also known as least-absolute-value model allows a more complete characterization of the regression relationship than Ordinary Least Squares (OLS) since it permits the parameters β s to differ at various points of the conditional distribution of the dependent variable y (Falaris, 2004). Furthermore, quantile regressions are less sensitive than mean regression or OLS to the presence of outliers in the dependent variables, something common in developing countries as the ones of the Andean region. In the case of quantile regressions, the residuals to be minimized are not squared as it is the case in OLS, therefore outliers receive less emphasis. If the error term of the regression is not normally distributed, then quantile regressions may be more efficient than OLS regression (Buchinsky, 1998).

OLS estimates the mean value of the response variable for given levels of the predictor variables. Meanwhile, quantile regression models the relationship between a set of explanatory variables and specific quantiles of the dependent variable. In OLS, the regression coefficient represents the increase in the response variable produced by one-unit increase in the predictor variable associated with that coefficient, while in quantile regression the parameter estimates the change in a specified quantile of the response variable produced by a one unit change in the predictor variable (Despa, 2012).

In our actual scenario for estimating the self-employed income premium, we follow Chernozhukov and Hansen (2013) whom stated that the ability of quantile regression models to characterize the heterogeneous impact of variables on different points of an outcome distribution makes them appealing for this particular application. One of the quantile regressions most attractive features is its ability to estimate quantile-specific effects that describe the impact of covariates not only on the center but also on the tails of the outcome distribution, which make them ideal for estimating the premium income difference among workers in the Andean countries. While the central effects, such as the mean effect obtained through OLS, provide interesting summary statistics of the impact of a covariate, they fail to describe the full distributional impact unless the variable affects both the central and the tail quantiles in the same way. In addition, interest focuses on the impact of covariates on points other than the center of the distribution in many cases, as in our present circumstance.

3.2 The model

To estimate the income premium of self-employment in the Andean countries, we evaluate the following equation:

$$y_i = \alpha SE_i + \beta X_i + \varepsilon_i \quad (1)$$

Where y_i is the monthly income for the principal activity of worker i in national currency, SE_i is a dummy variable that takes value of one if the worker is self-employed and zero otherwise, X_i is a vector that includes a set of worker and firm variables (gender, age, education, if the worker considers himself indigenous or not¹⁷, labor seniority¹⁸, size of firm, economic activity, hours worked, informality and iterations).

¹⁷ Some countries, like Venezuela and Colombia, do not report data regarding the indigenous conditions of workers in their household surveys.

¹⁸ There is no information regarding this variable for Venezuela.

We estimate equation (1) by using quantile regressions, the main advantage of using quantile regression, as mentioned before, is that it allows us to consider the high heterogeneity of self-employed. In fact, it is widely known that mean earnings do not characterize the returns of the majority of self-employed individuals. Therefore, the greatest advantage of using quantile regression is its ability to show snapshots of relationships across different quantiles of the distributions and not only at the mean.¹⁹

The main limitation of our procedure is related to the fact that individuals self-select themselves into self-employment. Our estimation procedure provides consistent estimates if the variables driving this self-selection are included in the vector X , i.e. our procedure rests on the conditional independence assumption (Rosembaum and Rubin, 1983). If other unobservable variables like ability drive the selection, then the estimates would be inconsistent. Unfortunately, the dataset for the Andean countries do not provide instruments to control for the omitted ability. Therefore, the estimates give us a characterization rather than a causal model.

4. Empirical results

To estimate the model, we use information from household surveys of the Andean countries (Bolivia, Colombia, Ecuador, Peru and Venezuela) harmonized by the Inter-American Development Bank for 2016, except for Bolivia and Venezuela where the latest available is 2015. Data appears in two columns and has been converted to US dollars using the average exchange rate of the year of the survey. The first column displays the results using quantile regressions for the bottom 25% and the second one for the upper 75% of the distribution, respectively.²⁰ A summary of the main results for the Andean countries is presented as follows.

Table 1 shows that with exception of Venezuela, self-employed workers in the Andean countries who are in the bottom 25% of the income distribution have negative income premium, suggesting that they would be hypothetically in a better situation in terms of income if they stopped being self-employed and find jobs as employees. Although Venezuela shows a positive premium, the magnitude (US\$3,27) probably is very small to generate enough incentive for workers to prefer self-employment. On the other hand, the results show that all the self-employed who are at the 25% top of the distribution of income have positive premium income compared with their counterparts in condition of dependency. These results reinforce the idea that there are two types of self-employment in the Andean countries, one composed by a minority of entrepreneurs with high skills and productivity that are capable of creating jobs and generating higher income, and the other composed by a majority of people who have no more alternative -given the absence of formal employment opportunities- than working as self-employees, most often in precarious labor conditions and informally.

¹⁹ Hamilton (2000) also follows Rosen (1981) by arguing that comparisons of mean earnings of self-employment and paid employment will be strongly influenced by a handful of high-income entrepreneurial “*superstars*” and mean earnings will not characterize self-employment returns of most business owners.

²⁰ We have estimated many specifications for the model using quantile regressions for each year and each country to check the robustness of our results, they are not reported in the document but are available upon request to the authors.

Table 1: Quantile regressions for self-employed workers in Andean Countries (Dollars)²¹

Independent variable	BOLIVIA		COLOMBIA		ECUADOR		PERU		VENEZUELA	
	QREG 25%	QREG 75%	QREG 25%	QREG 75%	QREG 25%	QREG 75%	QREG 25%	QREG 75%	QREG 25%	QREG 75%
Self-employed	-101.04*** (7.37)	62.48*** (20.80)	-3.63*** (752.0)	104.19*** (1,349)	-108.30*** (0.47)	111.70*** (0.32)	-74.56*** (1.357)	85.92*** (4.73)	3.27** (37.22)	149.74*** (30.94)
Women	-53.48*** (0.74)	-101.07*** (1.96)	-29.84*** (112.8)	-62.11*** (240.4)	-36.18*** (0.13)	-87.18*** (0.27)	-48.08*** (0.204)	-106.12*** (0.540)	-41.37*** (1.81)	-116.38*** (7.09)
Indigenous	-27.26*** (0.71)	-59.52*** (1.83)	-	-	-11.18*** (0.69)	-20.42*** (0.77)	-13.31*** (0.192)	-22.77*** (0.473)	-	-
# of worked hours per week	1.12*** (0.01)	1.49*** (0.06)	1.77*** (3.435)	2.85*** (6.755)	3.45*** (0.01)	6.14*** (0.00)	1.48*** (0.00)	3.00*** (0.01)	5.97*** (0.07)	9.10*** (0.35)
Firm size (medium)	39.59*** (0.75)	50.07*** (2.11)	48.01*** (139.0)	49.85*** (253.2)	53.97*** (0.17)	79.80*** (0.23)	47.28*** (0.249)	74.76*** (0.428)	27.14*** (2.51)	65.44*** (10.02)
Firm size (big)	46.65*** (1.38)	97.46*** (3.37)	71.86*** (198.9)	124.53*** (396.2)	127.40*** (0.24)	251.50*** (0.71)	72.04*** (0.469)	108.67*** (1.122)	26.29*** (2.79)	66.61*** (9.82)
Labor seniority	7.27*** (0.17)	12.57*** (0.34)	3.80*** (18.74)	9.09*** (50.09)	5.09*** (0.01)	8.03*** (0.02)	4.09*** (0.0269)	9.81*** (0.0762)	-	-
Labor seniority squared	-0.16*** (0.00)	-0.28*** (0.01)	-0.08*** (0.476)	-0.16*** (1.866)	-0.10*** (0.00)	-0.14*** (0.00)	-0.09*** (0.00)	-0.20*** (0.00)	-	-
Activity: mining worker	270.43*** (29.94)	295.07*** (4.27)	94.27*** (2,308)	453.56*** (1,735)	173.20*** (2.33)	431.70*** (9.24)	188.61*** (5.772)	476.63*** (2,387)	325.43*** (21.83)	671.27*** (271.60)
Activity: manufacture worker	91.74*** (2.52)	64.72*** (4.21)	25.45*** (266.2)	56.13*** (336.1)	41.48*** (0.18)	65.37*** (0.32)	69.67*** (0.391)	111.18*** (0.792)	67.90*** (9.06)	164.16*** (15.68)
Activity: electricity, gas and water services worker	121.46*** (3.55)	154.64*** (43.17)	26.55*** (836.8)	36.34*** (7,714)	64.46*** (0.93)	333.10*** (1.96)	89.14*** (4.093)	225.33*** (5.857)	86.12*** (31.50)	197.92*** (63.43)
Activity: construction worker	208.26*** (2.35)	195.51*** (3.55)	51.95*** (505.8)	85.29*** (321.3)	77.59*** (0.32)	102.00*** (0.27)	135.95*** (0.323)	233.49*** (0.941)	104.98*** (12.20)	166.79*** (23.20)
Activity: commerce worker	86.86*** (2.32)	110.55*** (4.24)	23.58*** (187.4)	60.06*** (301.2)	51.54*** (0.16)	108.50*** (0.31)	57.01*** (0.209)	104.64*** (0.762)	42.22*** (9.23)	78.00*** (9.20)
Activity: transport worker	169.71*** (2.45)	220.00*** (5.98)	23.14*** (177.90)	40.22*** (283.2)	74.85*** (0.20)	102.20*** (0.28)	102.46*** (0.647)	138.67*** (0.901)	104.16*** (15.09)	211.38*** (18.10)
Activity: financial worker	146.67*** (13.59)	207.39*** (5.11)	41.67*** (370.1)	80.45*** (338.7)	41.88*** (0.21)	75.60*** (0.64)	136.98*** (3.764)	350.00*** (1.368)	67.86*** (9.26)	173.31*** (23.32)
Activity: social services worker	112.90*** (2.30)	90.78*** (4.29)	29.83*** (165.9)	73.80*** (372.9)	82.99*** (0.26)	130.40*** (0.36)	63.05*** (0.361)	104.05*** (0.942)	66.43*** (9.08)	87.50*** (9.46)
Informal worker	-96.41*** (1.42)	-161.01*** (2.49)	-86.82*** (144.6)	-57.34*** (289.4)	-111.20*** (0.16)	-87.95*** (0.27)	-72.01*** (0.377)	-102.60*** (1.265)	-44.25*** (1.64)	4.05*** (8.71)
Self-employed x Informal worker	73.46*** (7.38)	15.16*** (21.00)	-14.04*** (756.8)	-114.47*** (1352.00)	70.03*** (0.47)	-104.00*** (0.33)	25.78*** (1.357)	-73.55*** (4.729)	24.09*** (37.31)	34.42*** (31.65)
Secondary education completed	50.19*** (1.26)	124.67*** (3.47)	86.90*** (489.2)	481.74*** (1,569)	102.60*** (0.25)	357.00*** (0.39)	55.15*** (0.331)	192.90*** (0.909)	61.04*** (4.63)	162.91*** (8.62)
Age between 25 and 40 years	37.71*** (0.79)	64.84*** (1.85)	20.80*** (128.9)	30.00*** (282.5)	24.78*** (0.17)	43.39*** (0.23)	43.34*** (0.244)	61.09*** (0.412)	27.66*** (2.61)	66.61*** (7.18)
Age older than 40 years	25.33*** (1.10)	97.38*** (3.25)	9.48*** (91.76)	28.92*** (206.6)	6.06*** (0.17)	26.83*** (0.23)	26.48*** (0.223)	44.62*** (0.673)	29.11*** (2.79)	93.37*** (7.92)
Constant	122.62*** (2.99)	316.81*** (5.29)	82.25*** (284.0)	69.04*** (502.7)	78.89*** (0.23)	56.40*** (0.37)	69.73*** (0.500)	126.12*** (1.620)	27.77*** (9.85)	-3.08*** (18.97)
Observations	2,865,895	2,865,895	16,658,574	16,658,574	4,467,084	4,467,084	11,491,817	11,491,817	10,191,947	10,191,947
Year of the survey	2015	2015	2016	2016	2016	2016	2016	2016	2015	2015
Exchange rate applied (average)	6.9	6.9	3,051.4	3,051.4	1.0	1.0	3.4	3.4	23.2	23.2
Percentile where the premium is 0	67		30		62		41		22	

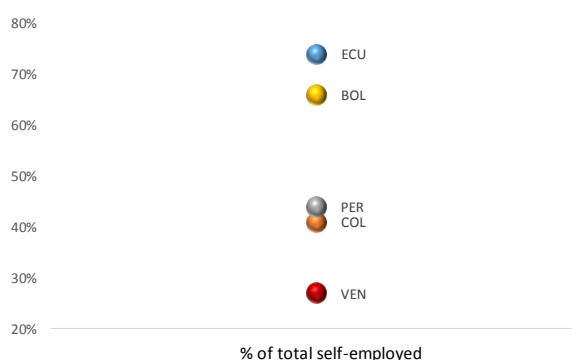
Source: Author's estimations using harmonized Household Surveys from the Inter-American Development Bank.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The results of the quantile regressions regarding the control variables also show us that there are income gaps by gender in all the Andean countries indistinctively of the position that women occupy in the income distribution. Moreover, informal workers in all the countries of the region have negative income premium in all cases regardless of their position in the income distribution, except for Venezuela, where the positive premium for informal workers in the upper 25% of the income distribution is around 4 dollars. Finally, we observe that workers with completed secondary education in all the cases have positive income premium that are even bigger for the upper quantile. We observe similar outcome for workers older than 40 years.

Table 1 also reports, at the bottom, the percentile where the income premium becomes zero for each country. This point gives us an idea of the proportion of self-employed workers who would be in a better situation in terms of income by switching from self-employment to wage earners. In general, the clear majority of self-employed workers in Ecuador and Bolivia would be better off as wage earners while in Peru and Colombia this result is somewhat around 40% (Figure 11).

²¹ To convert results to US dollars we used the average exchange rate of daily data from Bloomberg for the year of the survey, except for Venezuela where we used the average exchange rate of the World Economic Outlook.

Figure 11. Percent of Self-employed that are better off being wage earners



Source: Author's estimations

Note: First we calculate the percentile at which the income premium is zero (See percentile for each country in table 1). Then we calculate the percent of self-employed workers that earn the same or less than the income in that percentile.

Table 2 presents descriptive statistics for self-employed and employed workers below and above the umbral (the percentile at which the monetary premium becomes zero) in the Andean countries to observe any differences in the characteristics of workers. Results show us that most of the self-employed work on small firms, have higher labor seniority than employed workers, and are concentrated in commerce and services; self-employed workers, on the other hand, are almost entirely informal, have on average two years less education than employed workers and tend to be on average 10 years older than workers in situation of dependency. All these distinctive characteristics are intensified when comparing between the intra-country groups separated by the zero-premium umbral. We pay special attention to the fact that self-employed workers have greater labor seniority and are older than employed workers since this is suggesting a possible "trap of self-employment" that would keep them as self-employed reducing the chances of getting a formal job as an employee as time goes by.

Table 2: Descriptive statistics for self-employed and employed workers in the Andean Countries

	BOLIVIA						COLOMBIA						ECUADOR						PERU						VENEZUELA					
	< 67		≥ 67		All		< 30		≥ 30		All		< 62		≥ 62		All		< 41		≥ 41		All		< 22		≥ 22		All	
	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed	Self-employed	Employed
Women (%)	48%	40%	29%	30%	41%	36%	61%	66%	29%	43%	42%	46%	49%	41%	24%	36%	42%	38%	67%	59%	32%	40%	47%	43%	56%	49%	28%	43%	35%	44%
Indigenous (%)	31%	19%	23%	19%	28%	19%							4%	2%	3%	2%	4%	2%	30%	30%	24%	21%	26%	22%						
Worked hours per week (hours)	49	47	55	47	51	47	35	37	52	50	45	48	34	39	48	44	37	42	34	31	51	47	44	44	32	37	40	40	38	40
Firm size - small (%)	98%	48%	94%	21%	96%	37%	98%	77%	83%	19%	89%	27%	100%	59%	94%	12%	98%	33%	99%	68%	97%	25%	98%	31%	96%	35%	90%	17%	92%	21%
Firm size - medium (%)	2%	41%	6%	55%	3%	47%	1%	16%	7%	26%	5%	24%	0%	25%	6%	22%	2%	23%	1%	21%	3%	25%	2%	24%	3%	23%	7%	21%	6%	22%
Firm size - big (%)	0%	11%	0%	23%	0%	16%	1%	7%	10%	55%	6%	49%	0%	16%	0%	67%	0%	44%	0%	12%	0%	50%	0%	45%	1%	42%	2%	61%	2%	58%
Labor seniority (years)	10	4	10	8	10	5	7	2	8	5	8	5	12	7	13	9	12	8	10	3	10	6	10	5						
Activity: agricultural worker (%)	8%	3%	2%	2%	6%	2%	8%	5%	3%	3%	5%	3%	7%	14%	5%	4%	7%	8%	22%	14%	6%	6%	13%	7%	13%	12%	9%	4%	10%	6%
Activity: mining worker (%)	0%	1%	1%	5%	0%	3%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%	0%	2%	0%	2%	0%	0%	0%	2%	0%	2%
Activity: manufacture worker (%)	15%	17%	9%	11%	13%	15%	10%	9%	10%	17%	10%	16%	12%	14%	11%	13%	12%	13%	10%	9%	10%	13%	10%	12%	11%	8%	11%	9%	11%	9%
Activity: construction worker (%)	8%	14%	16%	16%	11%	15%	4%	4%	10%	7%	8%	6%	6%	14%	8%	7%	6%	10%	2%	7%	7%	9%	5%	9%	5%	5%	13%	7%	11%	7%
Activity: commerce worker (%)	42%	27%	37%	9%	40%	19%	44%	35%	34%	23%	38%	25%	44%	25%	44%	17%	44%	21%	48%	28%	41%	18%	44%	20%	41%	24%	28%	17%	32%	19%
Activity: services worker (%)	27%	38%	35%	57%	30%	46%	34%	46%	42%	49%	39%	49%	31%	32%	32%	58%	31%	47%	18%	42%	35%	51%	28%	50%	30%	51%	39%	61%	37%	59%
Informal worker (%)	95%	72%	91%	31%	94%	55%	97%	93%	77%	23%	85%	32%	85%	65%	67%	8%	80%	33%	100%	96%	100%	49%	100%	56%	100%	57%	100%	25%	100%	31%
Education (years)	9	11	10	14	10	12	8	8	10	12	9	11	9	9	11	13	9	11	8	10	10	12	9	12	8	9	9	11	9	11
Age (years)	44	32	42	39	43	35	44	35	43	36	43	36	45	36	45	38	45	37	49	35	45	38	47	38	43	35	42	38	42	37

Source: Author's estimations using harmonized Household Surveys from the Inter-American Development Bank.

Note: We used the 2016 surveys for all countries, except for Venezuela and Bolivia for which we used 2015.

5. Conclusions

This research looks at the possible channels in which self-employment can be harming productivity outcomes in the region. At par, it also goes beyond those links and tries to uncover what motivates workers to opt for self-employment either by the advantage of being their own boss or by the lack of jobs with better benefits.

On the possible channels, we find that there are three issues related to the firm's market that can bind the rise of a salaried workforce by preserving a sizable self-employed force that undermines productivity in the Andean Region. One aspect relates to the high agglomeration of micro-enterprises that concentrates most of the employment (oscillating between 40% to 65% of the market), contrary to OECD countries where micro-enterprises are also abundant but employment is mainly absorbed by medium and big size firms. The second aspect focuses on the low productivity of micro and small firms fueled by the low quality of their labor and capital, credit constraints, informality, misallocation of resources and deficient industry dynamics. Additionally, policies in place targeting micro and small firms and inadequate institutions can preserve distortions by allocating resources from more productive uses to less productive firms and by perpetuating the vicious circle of low productivity firms and the absence of a strong mass of medium and big size companies that can boost a salaried workforce. The third aspect is linked to a larger dispersion in productivity across firms explained by differences in process, technologies, human capital, managerial skills and inefficient allocation of resources that suppresses the movement of resources to more efficient uses.

The service sector is on a downward spiral and is dragging down productivity in the Andean region as well. Productivity of the service sector to the industry has been steeply falling since the 90's while labor productivity growth, although small in the 90's and early 2000's, has gained some momentum after the commodity boom. These gains are explained by within sector productivity and labor reallocation from less productive to more productive sectors (static reallocation) but has lost some of those gains as people moved towards sectors where productivity growth is below average (dynamic reallocation). In this regard, the industry sector is the motor of productivity growth in Latin America with within sector improvements driving the growth. On the contrary, the service sector is dragging down productivity by a small within sector productivity that is only helping to the boost by absorbing higher employment shares. The slow productivity growth of the service sector can be linked to a growing movement of employees towards the sector, in which a lower entering cost coupled with lack of formal jobs incentive self-employed workers to easily access this market.

To uncover the motivations that incentive workers to opt for self-employment, we estimate quantile regressions in such a way that we can distinguish whether there is a monetary income premium for those at self-employment compared to wage earners at various levels of income. Our findings indicate that own-account workers in the Andean countries who are in the bottom 25% of the income distribution have negative income premiums, suggesting that they would be better off as salaried workers. Although Venezuela shows a positive premium, the magnitude is very small to probably generate enough incentive to prefer self-employment. On the other hand, own-account workers at the top 25% of the income distribution have positive income premiums. These results indicate that there are two types of own-account workers in the Andean countries, one composed by a minority of entrepreneurs with high skills and productivity that can create jobs

and generate higher income, and the other composed by people who have no more alternative - given the absence of formal employment opportunities- than creating their own way of living, usually in precarious labor conditions, under informality and probably facing a job-trap, based on higher labor seniority and age among those at self-employment, from where is difficult to escape.

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