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RESUMEN

Este trabajo resume la literatura teórica de las conexiones entre desigualdad, crecimiento y cambio estructural y presenta evidencias de estas conexiones para una muestra de doce países de América Latina en el período 1980-2011. Estas sugieren que en sólo cuatro de estos países el bajo grado de cambio estructural en dichos países ha tenido un impacto sobre la desigualdad y el crecimiento económico y por lo tanto no sustenta la conjetura que el cambio estructural ha reducido la tasa de crecimiento en América Latina. La ausencia de causalidad desde el cambio estructural hacia el crecimiento económico en los ocho países puede deberse a que la medida de cambio estructural de la reasignación de la fuerza laboral entre sectores productivos no toma en cuenta la movilidad de la fuerza labora informal. De otro lado, la cobertura de países de América Latina de las relaciones de causalidad desde el crecimiento o la desigualdad hacia el cambio estructural ha sido mayor que la causalidad contraria. En siete de los doce países analizados dichas causalidades existieron estadísticamente.

ABSTRACT

This paper summarizes the theoretical literature of the connections between inequality, economic growth and structural change and presents evidence of these connections for a sample of twelve Latin American countries in period 1980-2011. This suggests that the low degree of structural change has caused a statistical impact on inequality and economic growth in only four and one countries respectively. Consequently, this result rejects the conjecture that structural change has been growth reducing in Latin America. The absence of a statistical causal relationship from structural change to economic growth may be because sectoral labor reallocation does not take into account informal activities. On the other hand, coverage of the causal effects of growth and/or inequality on structural change has been greater than the respective effects of structural change on inequality and/or economic growth. Seven Latin American countries experienced those causal effects.

Key words: Structural change, inequality, economic growth

JEL: O54, O12

INEQUALITY, ECONOMIC GROWTH AND STRUCTURAL CHANGE: THEORETICAL LINKS AND EVIDENCE FROM LATIN AMERICAN COUNTRIES

Mario D. Tello*

1. INTRODUCTION

Since the work of Kuznets (1955), there exists an abundant literature that analyses the relationship between economic growth (EG) and income distribution (ID) from different angles. A first group of studies concentrates on the linear and non-linear effects of ID on EG, yielding opposite results depending upon the sample and the econometric techniques used (e.g., Benhabib and Spiegel, 1998; Forbes, 2000; Li and Zau, (1998), Barro, 2000; Banarjee and Duflo, 2003; and Easterly, 2007). A second group deals with the effects of EG on ID (e.g., Korzeniewicz and Moran, 2005; Frazer, 2006; Alejo, 2013), producing also mixed results. Specifically, as pointed out by Frazer (2006), '*it does appear that there have been a variety of ways to grow, at least when it comes to changes in inequality*'. A third group concentrates on the causality, co-integration and interdependence between EG and ID (e.g., Risso, Punzo, and Sánchez Carrera, 2013: Alawin, Siam and Al-Hamdi, 2013: Razmi, and Shrafzadeh, 2012; Squire and Lundberg, 2003; and Ravallion, 2001), wherein the directionality varies among countries. A fourth group deals with the theoretical arguments and models that explain such interdependence[1] (e.g., Taylor and Arida, 1988; Aghion, Caroli, García-Peñalosa, 1999; Ferreira, 1999; and Galor, 2009).

Consistent with this literature, and subject to the limitations of the measurement of inequality, there is a presumption that this measure —usually the Gini coefficient varies through the process of development and there are no universal trends. Figure 1 supports this presumption for four countries (two developed and two from Latin America) with

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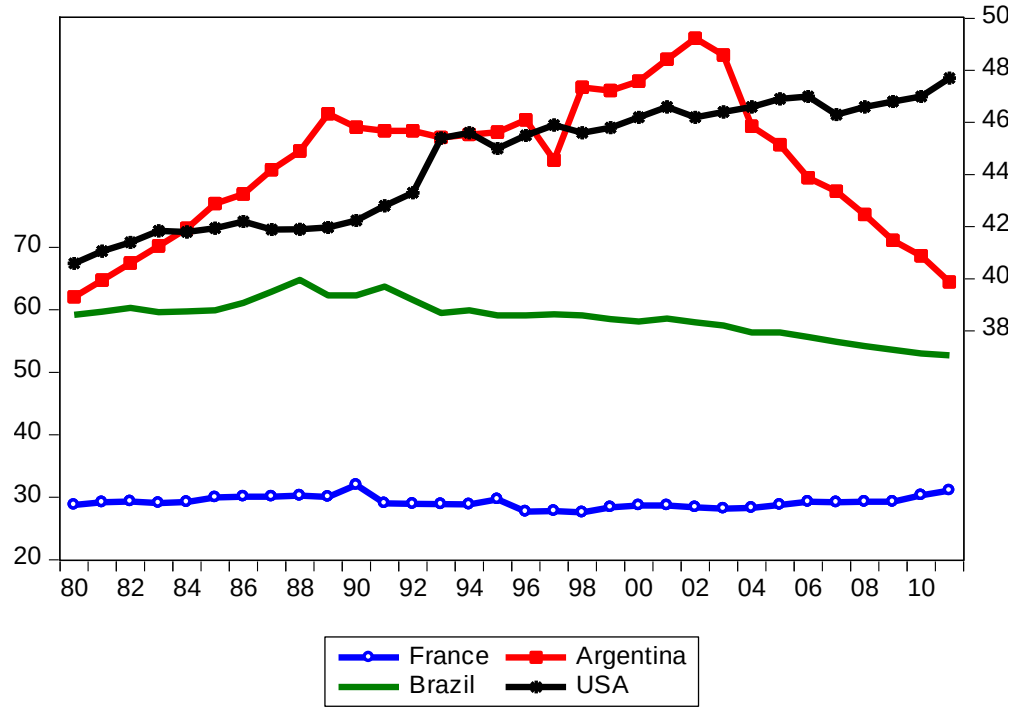
1 Issues of inequality measurement (e.g., Aitkinson, 1970; Sen, Dasgupta and Starret, 1973) and alternative concepts of inequality (such as 'inequality of opportunities', e.g., Romer, 1998, 2006, and Ferreira and Gignoux, 2012) are not analyzed in this paper.

similar rate annual average per capita real GDP growth in period 1980-2011 of around 1.3%. Thus, Argentina ID curve supports the Kuznets hypothesis[2]. Whereas United States has had an increasing trend of inequality, Brazil had a decreasing trend, and France's Gini coefficient has remained practically constant the whole period.

Figure 1: Gini Coefficients



On the other hand, as suggested by Syrquin (1988) and many others, the process of economic development involves transformation or structural change (SC) of a society based upon accumulation and sectorial composition. While sustained increase in the rate of accumulation is necessary for long-run growth and transformation, this is not sufficient for economic development. The second component needs to be internalized for development to take place. The most common use of structural change in development and in economic history refers to the importance of sectors in the economy in terms of production and factor use and on the reallocation of resources across sectors. Sectoral output shares, the ratio between consumer final goods (e.g., food) and producers (intermediate) goods; product and export diversification, and reallocation of labor are the

[2] The scale of the right axe corresponds to Argentina and United States and the scale of the left axe corresponds to France and Brazil.

standard indicators of structural change.[3] Despite of the relevance of the economic transformation in the process of economic development, the empirical literature on the effects of structural change on ID, which uses those indicators, is not as abundant as the previous one. Nonetheless, recent evidence (e.g., Rendall, 2013; Aizenman, Lee and Park, 2012; Acar and Dogruel, 2012; Vaona, 2011, and UNRISD, 2010) points out that structural change has had positive and negative effects on different measures of ID, depending upon the type of structural change, the level of GDP per capita and the geographic region.

Along these lines, this paper summarizes the theoretical literature of the connection between income distribution, economic growth and structural change, focusing mainly on the links of the last two upon income distribution. Thereafter, it presents evidence on those relationships for a sample of twelve Latin American countries (LACs) in period 1980-2011. Sectoral labor reallocation and agricultural output share, rate of growth of per capita real GDP, and the Gini coefficient, respectively, are the main measures used in the statistical analysis for SC, EG and ID.

2. INCOME DISTRIBUTION, ECONOMIC GROWTH AND STRUCTURAL CHANGE: THEORETICAL LINKS

The question to what extent reallocation of resources and growth have any bearing on income distribution has been subject of theoretical analysis since the 'classical development economists' (e.g., Schumpeter, 1934, Lewis, 1954; and Rosenstein-Rodan, 1943; Rostow, 1960, among many others). For them, 'a development process takes place' when agents in the economy undertake innovation, technological and/or institutional changes. The sources of these changes for the classical economists were demand driven (Taylor, 1988). Underdeveloped economies were characterized by dual sectors, wherein the market mechanism allocated resources within the highly productive modern sector and real wages were determined 'exogenously' by the average productivity in the low

[3] Recently, Aizenman *et al*., (2012) propose a 'broader' concept of structural change, which encompasses social, political, cultural, societal, and other changes. On the other hand, Kuznets (1973) includes as structural change: *"the shift away from agriculture to non-agriculture pursuits, and, recently, away from industry to services; a change of the scale of productive units, and a related shift from personal enterprise to impersonal organization of economic firms, with a corresponding change in the occupational status of labor"*.

productivity traditional and communal sector. As demand of the products of the modern sector expands[4], and labor moves from traditional to modern sectors, income distribution would improve as long as real wage in the modern sector was higher than that of the traditional one and total income would increase. The ID improvement would be even higher when the modern sector absorbs all the labor force and/or when the traditional sector became a capitalist sector with wages determined by market forces. Lopez (2007) called this result a "benign structural change".

Formalization of the connection between ID, EG and SC has been progressive. Taylor and Arida (1988), Aghion, *et al* (1999), and Galor (2009) summarize the models of the relation between growth and income distribution. Herrendorf, Rogerson and Valentinyi (2014) provides the survey of the 'new structural change' literature (e.g., named by Buera and Kaboski 2009)[5] on the relationship between economic growth and structural change. Formal models on the relationship between ID and SC, however, are still in their early stages (e.g., Matsuyama, 2002 and Buera and Kavoski, 2012). This set of three models suggests that differences in behavioral parameters among sectors, prices effects, wealth and land distribution, natural resources (and their respective environmental effects), and/or the existence of 'home production'[6] or 'market failures' (yielding multiple long run

[4] Sources of this expansion could be: i) external demand-via free or liberalizing trade (e.g., Lewis, 1954); ii) domestic demand (e.g., Rosenstein-Rodan, 1961; Murphy, Shleifer, and Vishny, 1989); or iii) through a higher propensity to save of capitalists than the workers of the modern sector (e.g., Kaldor, 1955).

[5] According to Matsuyama (2008), 'traditional structural change' literature attempted to establish some stylized facts on the patterns of development followed by most countries. Among the most well-known studies are those of Fisher (1939), Clark (1940), Kuznets (1966) and Chenery and Syrquin (1975), who postulated that, as the economy grows, the production shifts from the primary (agriculture, fishing, forestry, mining) to the secondary (manufacturing and construction) to the tertiary sector (services). Also notable is Rostow (1960), who argued that the economy passes through various stages of development from the traditional stage to the take-off stage to the mass consumption stage. This literature is mostly descriptive, trying to provide a sweeping overview of the development process, with the emphasis on the multifaceted nature of structural change.

[6] According to Ngai and Pissaradis (2008), 'home production' is defined as time spent on the production of goods and services, usually at home but sometimes outside, for one's own use. Two properties of home production that distinguish it from leisure are that the individual derives utility from the output of home production but not from the time that she spends on it, and that home production can be "marketized," (i.e., someone else can be paid to do it and the individual can still derive the same utility from its output). In contrast, leisure cannot be marketized, the individual has to spend the time herself to enjoy. Examples of 'home

equilibria or steady states), the relationship between ID, EG and SC may be not linear or unique. Formally, in these models, the 'exogenous changes' that trigger the dynamic of an economy from one equilibrium to another are technological, institutional, and economic policies. On the other hand, apart from endowments, and price effects of consumption of goods and services, labor skills differences and/or market failures shape the income distribution among households of the economy.

2.1 From Structural Change to Income Distribution

Apart from the ´benign' demand-driven classical mechanism by which SC affects income distribution[7], the literature consider a variety of links between them. First, *neutral effects of SC on ID* arise from the vast literature of (balanced and unbalanced) growth and structural change models, reconciling Kaldor´s facts (1961) of one sector growth model with structural change models of growth with two or more sectors[8]. In these models, labour and capital shares are constant at the long-run equilibrium in the presence of reallocation of resources due to the fact that factors are assumed homogenous in all sectors and perfect mobile between them.

Second, Barbier (2013), Botta (2010), Lopez (2007), and Antocia, Russua and Ticci (2009) postulate *perverse structural change effects on ID*. On the one hand, Barbier (2013) affirms that: *"as long as a rural residual pool of labor exists, workers shifting from the rural*

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production goods' in the early development process in that produced by peasant that grew their own crops, kept small farm animals, made clothes and preserved food. Standard household home production are cleaning, cooking and childcare. In modern industrial societies, virtually most of home production are service goods. These activities include shopping, looking after children and other relatives and administration (keeping bank accounts, dealing with bills, etc.).

7 Note that causality could be the other way around. Thus, Matsuyama (2002) presents a model where endogenous technological changes generates income distribution changes and these cause structural change with appearance of consumer goods with penetration rates showing a Flying Geese pattern. Similar static results are found by Murphy, Shleifer and Vishny (1989b). Also Patriarca and Vona (2013) develop a disequilibrium two sector model wherein transitory changes in the distribution of the innovative rents crucially affect the long-run outcomes of structural change.

8 These Kaldor's (1961) facts (i.e., at long run equilibrium, the growth rate, interest rate, capital output ratio, and labor share are constant over time) can be consistent with resources reallocation among sectors experienced by both developed and developing economies.

economy to the modern sector will not necessarily be better off if real wages in the modern sector did not increase. In such a case, ID would worsen in the transition period.[9] Botta (2010), on the other hand, argues that demand expansion due to an export boom in industries intensive in the use of natural resources may produce poverty traps avoiding the final stage of the classical development process as long the rest of industries not intensive in the use of natural resources are not promoted by the export expansion. A third possibility of worsening ID may occur if the labor reallocated from traditional to the modern sector end up in low productivity informal jobs with real wages lower than those in the modern sector (e.g., Lopez, 2007). Similar results were obtained by Antocia, Russua and Ticci (2009) wherein the traditional sector and modern sector are intensive in the use of natural resources and the output of modern sector has environmental deterioration effects.

Third, the role of the home and market production of goods and services on the effects of SC on ID are based upon the Ngai and Pissaradis's model (2008)[10]. This predicts that when two goods or services are poor substitutes for each other (e.g., agriculture, manufactured goods and services), hours of work move in the direction of the good with the lower total factor productivity (TFP) growth rate. When they are good substitutes for each other (e.g., home and market production of goods-services of a sector), they move in the direction of the good with the higher TFP growth rate. Consequently, in the early stages of development, higher TFP growth in modern sectors (manufactures and agriculture) would yield that hours of work in the production of market goods within each sector would increase and those of the home production would decrease. In the next stage when the services has the lowest TFP rate of growth, hours of work of home production in this sector would increase and the respective of manufactures and agriculture market

[9] During this transition period, Barbier (2013) suggests that: "targeted policies are required to raise real wages and alleviate widespread rural poverty in marginal areas. Such policies include investments to improve the livelihoods of the rural poor in remote and fragile environments, appropriate research, extension and agricultural development for marginal lands, and better market integration through extension service, roads, communication, protection of property, marketing services and other strategies to improve smallholder accessibility to larger markets".

[10] Another role of home production is that of the literature that applies a calibration approach to the neoclassical growth model to account for cross-country differences in productivity including two or more sectors models (e.g., Gollin, Parente, and Rogerson, 2004).

production goods would decrease. In later stages, the TFP of the market production of services would be higher producing a rise of the hours of goods of the production of those services.

The effect of the allocation of hours of work and labor supply among sectors, home, and market production on ID will depend upon the degree of skills of the workforce and the skill intensities of sectors and production. In such cases, sectors of market production with relative high TFP growth and skill intensive would create incentives for both market production of wants and skill accumulation and because there is an upward-sloping supply curve for skilled workers, the skill premium would increase, worsening the ID of the economy (e.g., Buera and Kaboski, 2012a).[11] Cook and Uchida (2008) present evidence of this effect. Their main findings were that the development of high tech industries[12] has the greatest prospects of contributing to growth, but has a poor record as far as income distribution is concerned. The likely effect on income distribution results from the disproportionate employment of skilled workers drawn from the educated and existing pool of employed labour to this sector. Similarly, Kim (1977), using demand decomposition from 1960 and 1970 Korea´s input-output tables, concludes that the increased intermediate demand from the manufacturing sector led to higher level of inequality, between these two years, as industrial wages were substantially higher than ´farmers' wages.[13]

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[11] Buera and Kaboski's (2012a) model try to explain the marked increase in wage inequality associated with the return to skill experienced by the United States (US) the past 50 years. They argue that the rising return to skill is intimately connected to the structural transformation of economic activity toward services. Further, they found evidence that the entire rise in the US service sector's share in value added in the last fifty years is accounted for by growth in sub-sectors that have higher than average shares of skilled labor.

[12] Cook and Uchida (2008) use two export measures related to structural change: symmetric technological comparative advantages (using country data on patents) and revealed comparative advantage (using country exports flows). Both measures were developed by Laursen and Engedal (1995).

[13] The effects on ID of changes of the demands for skills due to structural change also has been applied to explain gender inequality. Thus, Rendall (2013) finds that: *"India, the country with the greatest physical labor requirements, exhibits the largest labor market gender inequality. In contrast, Brazil's labor requirements have followed a similar trend seen in the United States, reducing gender inequality in both wages and labor force participation…these results highlight the importance of structural change in reducing gender disparities by decreasing the labor demand for physical attributes."*

Fourth, market distortions may affect the allocation of resources between low and high productivity sectors producing inter-sectoral wages differences and consequently affecting income distribution. The lower (higher) the level or the number of distortions, the higher (lower) would be the reallocation of resources from low to high productivity sectors and ID would improve (worse). The relevant market distortions are those affecting directly to producers of goods and/or services. Thus, Restuccia, Tao Yang, and Zhu (2008)[14] consider, on the one hand, distortions that raise the costs of non-agricultural intermediate inputs used in agriculture production[15] and, on the other hand, indirect barriers associated with labor market distortions.[16] These distortions (which produce barriers to the use of modern intermediate inputs) encourage farmers to substitute cheap labor for other inputs and lead to a higher share of labor in agriculture and lower labor productivity for the overall economy.

A fifth link comes from the dynamic of the size distribution of firms among sectors (related to scale of production, differences in total factor productivity and entrepreneurial talent) in the presence of *idiosyncratic distortions*[17]. Thus, in the model of Buera and Kavossi (2011) the size of the establishment is determined by a period fixed cost of operating an establishment. Large firms' size has higher fixed cost (for example, manufactured firms) and small firms' size has lower fixed cost (for example, farmers). On the other hand, individuals can be either entrepreneurs or workers in each sector. The idiosyncratic distortions analyzed by them are financial frictions (modelled in the form of endogenous collateral constraints founded on imperfect enforceability of contracts). These distortions affect the establishment size distribution. Higher the level of these distortions (which finance the period fixed cost) will lead to a higher number of small size firms in the

14 Vollrath (2009) consider a general way to modelling factor market inefficiencies.

15 Such as protection (through tariffs, import quotas or indirectly by allowing the survival of inefficient producers) of domestic industries (i.e., fertilizers) and lack of investment in market infrastructure (e.g., roads and distribution systems) of geographically dispersed rural households.

16 For example, obstacles to migration reduce labor flows from the agricultural to non-agricultural sector, and when combined with institutionally protected urban wages, often suppress agricultural wages to very low levels.

17 The direct effect of these distortions is to create heterogeneity in the prices faced by individual producers. These idiosyncratic distortions lead to a reallocation of resources across establishments (Restuccia and Rogerson, 2008).

agricultural sector (with lower prices and wages), and a lower number of firms of large size in the manufacturing sector (with higher prices and capital returns).

By assuming the same (Pareto) distribution of entrepreneurial talent in both sectors, Buera and Kavoussi (2011) calibration exercises did not produce effects on the functional ID. However, if the distribution of entrepreneurial talent differs between sectors (i.e., assuming the respective tail index parameter of the Pareto distribution of the agricultural is higher than the manufacturing sector)[18], then a higher level of distortions will reallocate resources toward the agricultural sector and ID will worsen (i.e., increasing capital income share and lowering labor share).

2.2 From Growth to Income Distribution

Most of the recent theoretical literature has emphasized the reverse causality. Galor (2012 and 2009) summarizes the models and arguments from this literature. He postulates that: *"while classical economists advanced the hypothesis that inequality is beneficial for growth, the neoclassical paradigm dismissed the classical hypothesis and suggested that income distribution has limited role in the growth process…interpreting implicitly the observed relationship between inequality and economic growth as capturing the effect of the growth process on the distribution of income. This viewpoint can be traced to Kuznets (1955)'s findings of the inverse U relationship between inequality and economic development, and his suggestion that they reflect causation from development to distribution."* (2012 and 2009)

In the third and 'modern' perspective, wherein its focus is on the causality from ID to EG, human capital, 'market distortions' and political economy aspects play key roles in this link. Thus, Galor and Zeira (1988, 1993) have demonstrated that in the presence of credit market imperfections and fixed costs associated with investment in education, occupational choices (and thus the efficient segmentation of the labor force between

[18] The higher is this parameter, the measure of talent approximates to the lowest measure of talent.

skilled and unskilled workers) are affected by the distribution of income. In particular, if the interest rate for borrowers is higher than that for lenders, inequality may result in an under-investment in human capital. Inequality may therefore adversely affect macroeconomic activity and economic development in the short-run, and due to intergenerational transfers and their effect on the persistence of inequality, it may generate a detrimental effect on economic development in the long-run as well.[19] On the other hand, considering the political economy aspects of the EG-ID link, studies suggest in societies that are characterized by inequality, distributional conflicts may bias political decisions in favor of appropriation. Hence, since the incentives for productive accumulation of physical capital, human capital, and knowledge hinge on the ability of individuals to privately appropriate the return on their investment, inequality may diminish investment and economic growth (e.g., Alesina and Rodrik, 1994, and Persson and Tabellini, 1994). Alternatively, Saint-Paul and Verdier (1996) and Benabou, 2000, 2002) advanced the thesis that inequality may in fact generate an incentive for better-endowed agents to lobby against redistribution, preventing efficient redistribution and/or enhancing human capital formation policies from being implemented.

Taylor and Arida (1988) and Aghion, Caroli, and García-Peñalosa (1999) summarize the key elements of the theoretical links from growth to income (particularly wages or earnings) distribution. These are: i) relative changes of factor demands and the respective changes in good and factor prices; ii) the relative changes in factor supply and their adjustment period to respond to changes of factors and goods demand; iii) the coexistence of 'formal and informal' labor markets; and iv) firms organizational changes. Aghion *et al* (1999) analyze the effects on factor market returns and Taylor and Arida (1988) on goods markets prices.

[19] Note, however, that in poor economies, where the fixed cost of education is high in comparison to the level of income per capita, inequality may permit at least members of the upper tail of the income distribution to undertake investment in human capital. Hence, higher inequality would be expected to be associated with higher investment in education (Galor, 2012).

Thus, according to Aghion *et al* (1999), observed relative wages are the outcome of a "race" between the forces increasing the supply of skills—education and experience— and those increasing the demand for skills required by firms. The dominance of one of these forces would depend upon the sources of these changes. Three key sources of demand are the degree of trade openness or liberalization, the skill-biased technological change, and the organizational change within firms. Thus, for the first source, in poor countries—where abundant unskilled labor is cheap and scarce skilled labor is expensive—a trade boom (liberalization) would drive up the demand for unskilled labor and drive down the demand for skilled labor, lowering earnings inequality. On the other hand, for rich countries—where unskilled labor is expensive and skilled labor is cheap—a trade boom (liberalization) would drive up the demand for the latter and drive down the demand for the former increasing therefore earning equality. This argument would be also valid for industrialized economies if most of the importable goods were intermediate and good substitutes for unskilled labor and complementary with skilled labor.

In the case of the second source, the relationship between the technological change and wage inequality is more complex and will depend upon whether technology is disembodied technical change (such as general purpose technologies, GPT) or embodied technical change (e.g., equipment of different vintage incorporate specific technical knowledge). Aghion *et al* (1999) postulate that in the former type, the diffusion process of the GPT generates a rise and then a decrease in wage inequality during the transition from the old to the new GPT and in the latter type technical progress enhances within-cohort inequality as long as workers' mobility between vintages is low. In last source of organizational change, they argued that the specific way in which workers interact and learn in the workplace is likely to be crucial in determining their productivity, and hence wages.

Taylor and Arida (1988) summarize the literature of the traditional prices of final goods effects of growth on ID. The change of relative prices of the different sector would depend upon the demand and supply income and price elasticities, and their effects on ID upon the propensity to consume goods of households. A key element which explains the

potential effects of EG on ID (as it was the case of the effects of SC on ID) is the size of the ´subsistence sector', ´reservation army´ or in modern terms ´the informal sector'. This factor produce two opposite effects: on the one hand, reduces the upward wages pressures coming from growth demand effects, which may increase inequality as long as non-agricultural prices rise and the non-labor income share increases, on the other hand, avoid worsening of the ID due to its buffering role under recessive exogenous shocks.

Summarizing, given an exogenous technological and/or institutional change in an economy, there exist differentiated effects of growth and structural change (i.e., reallocation of resources among or within sectors) on income distribution. The growth effect concentrates on the demand side effects in the presence of supply restrictions, informal activities and organizational responses, regardless of the sector. The structural change, on the other hand, concentrates in the sectoral differences of such initial demand change in the presence of market (and idiosyncratic) distortions, home-market production, factors (labor, capital and firms) heterogeneity, and the existence of low-productivity sectors-activities (informal and home productive activities). These differences and aspects produce incentives or disincentives to resources (capital, labor, firms) to reallocate among and within sectors.

On the other hand, in all these cases, causality could be reversed. Specifically, income distribution may cause economic growth (e.g., Matsuyama, 2002; Murphy, Shleifer and Vishny, 1989b; and Patriarca and Vona, 2013) and structural change (e.g., Vollrath, 2009), and economic growth may cause income distribution (e.g., Galor, 2012 and 2009) and structural change (e.g., Herrendorf, Rogerson, and Valentinyi, 2014). The interpretation of the macro evidence presented below considers these causal links.

3. STYLIZED FACTS ON INCOME DISTRIBUTION, ECONOMIC GROWTH AND STRUCTURAL CHANGE IN 12 LATIN AMERICAN COUNTRIES

Table 1 shows the main indicators of EG, SC and ID for a sample of twelve Latin American Countries (LACs) in period 1980-2011. The list of databases used for these indicators are described in the source of this table. Apart from the output sectoral shares, three others structural change indicators are described in Table 1: labor reallocation effect (RE), the ratio of labor productivities (RLP) and the contribution of the reallocation effect to the labor productivity change (RE/ΔLP). For the estimates of the reallocation effect, except for Panama, El Salvador and Dominican Republic, real value added and employment shares of nine sectors were used for the sample of LACs. These are agriculture, hunting, forestry and fishing; manufacturing; transport, storage and communication; mining and quarrying; electricity, gas and water; wholesale and retail trade, hotels and restaurants; construction; finance, insurance, real estate and business services; and other services. For the three Central American Countries the real value added and employment shares were three: agriculture, industry and services.[20] On the other hand, for the estimates of the annual average contribution of this reallocation effect to the labor productivity growth (RE/ΔLP), the outlier's figures for some countries were not taken into account.[21] Considering the relevant sectoral LP averages for period 1980-2011 and for El Salvador, Dominican Republic and Panama, the labor productivity ratio, RLP, is estimated using the weighted average of the two lowest labor productivity sectors (i.e., agriculture and services) over the highest labor productivity sector (i.e., industry). For the rest of LACs, the ratio is estimated using the weighted average of the five lowest labor productivity sectors over the respective averages of four highest labor productivity sectors[22].

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[20] Using the real value added (in US$ 2005) and labor force of all the countries and the sectoral shares, the real value added and employment of all the relevant sectors were estimated. Note that $\Delta LP_{jt} = \sum_i \Delta LP_{ijt}.S_{0ijt} + \sum_i \Delta S_{ijt}.LP_{0ijt}$; where in S_{0ijt} and LP_{0ijt} are the respective average change of employment shares and labor productivity of period 't' and 't-1'. The first component is the within effect and the last component is the reallocation effect.

[21] The country and years with outlier figures were: for Argentina, 1984; Bolivia, 1981; Brazil, 1987, 1992; Colombia, 1987, 1995, 2001, 2005; Costa Rica, 2008, 2010; El Salvador, 1993; Mexico, 1992; Panamá, 1994; y Venezuela, 2000.

[22] The five lowest labor productivity sectors were agriculture, hunting, forestry and fishing; other services; wholesale and retail trade, hotels and restaurants; construction; and finance, insurance, real estate and business services. The four highest labor productivity sectors were:

The main features of the figures are in the first place, and from a long perspective (period 1980-2011) only two countries (Chile and Dominican Republic) reached an average per capita GDP growth of around 3% per year. At the other end, three countries (Mexico, Venezuela and Bolivia) had an average per capita GDP growth less than 1%. Venezuela was the only country wherein its 2011 per capita GDP level was lower than that of 1980. From the medium long run perspective (corresponding to the first decade of this century, period 2000-2011), all LACs but Chile increased their rate of per capita GDP growth. The highest growth countries in this period were Panama and Peru and the lowest was Mexico. Second, in the long run period, only four countries (Chile, Mexico, Brazil, and El Salvador) decreased the degree of inequality. In terms of level, in these countries except El Salvador, the 2011 Gini coefficient was lower than that of 1980. Similar to the growth case, in all LACs except Costa Rica inequality decreased in period 2000-2011.

manufacturing; transport, storage and communication; mining and quarrying; electricity, gas and water.

Table 1.
Descriptive Facts on Income Distribution, Economic Growth and Structural Change for Latin American Countries (%)

		Chile	Mexico	Panama[1]	Argentina	Venezuela	Brazil	Costa Rica	República Dominicana[2]	Colombia	Perú	El Salvador[2]	Bolivia
1) Sectorial Indicators													
S_{AGR}	2011	3.69	3.38	4.11	10.70	5.79	5.46	6.51	5.96	6.86	7.05	12.51	12.53
	Growth Rate 80-11	-1.55	-2.72	-2.29	3.90	1.15	-1.43	-2.28	-3.07	-3.01	-1.66	-1.31	-1.14
	Growth Rate 2000´s	-4.04	-1.11	-4.26	10.99	-5.89	0.30	-4.03	-1.34	-5.15	-0.89	1.11	-1.76
S_{MAN}	2011	11.53	17.10	5.61	20.80	13.92	14.60	17.24	24.60	13.56	14.77	20.25	13.26
	Growth Rate 80-11	-1.53	-0.71	-1.73	-0.87	0.29	-2.37	-1.03	2.43	-1.68	-1.51	-0.38	1.10
	Growth Rate 2000s	-4.06	-1.42	-5.01	1.37	-10.86	-0.70	-4.45	-0.70	-0.68	-0.67	-1.44	-1.46
S_{SERV}	2011	58.32	60.90	79.19	58.19	42.05	67.01	68.18	60.96	55.27	56.38	60.61	48.52
	Growth Rate 80-11	0.29	0.25	0.34	0.48	-0.01	1.46	0.87	0.79	0.52	-0.27	0.44	0.04
	Growth Rate 2000´s	0.42	-0.02	0.59	-1.00	-9.33	-0.17	2.10	0.84	-0.28	-0.14	0.42	-0.85
S_{MIN-UT}	2011	14.46	8.34	4.47	6.18	27.58	6.47	2.48	2.27	12.36	9.89	2.03	16.10
	Growth Rate 80-11	-0.17	-0.42	1.65	0.65	-0.18	0.10	0.77	-1.56	2.38	-0.17	-0.02	0.50
	Growth Rate 2000s	-3.31	-1.30	0.28	-0.86	-2.45	1.03	-0.37	-2.71	-1.12	-0.48	-0.31	1.94
S_{Xgs}	2011	38.01	31.57	86.80	21.82	29.94	11.89	37.48	25.05	18.93	28.70	27.98	44.12
	Growth Rate 80-11	2.18	4.74	-0.05	8.11	2.86	2.24	2.03	2.61	1.26	2.76	2.35	2.65
	Growth Rate 2000´s	2.28	2.01	2.19	11.45	5.47	2.57	-2.45	-2.13	0.63	8.91	5.93	1.20
S_{XMAN}	2011	4.52	21.91	6.28	6.06	0.70	3.53	15.29	10.30	3.02	3.52	16.13	1.38
	Growth Rate 80-11	4.99	15.48	2.91	7.19	13.07	1.45	6.68	23.50	3.32	1.04	3.60	22.13

Table 1.
Descriptive Facts on Income Distribution, Economic Growth and Structural Change for Latin American Countries (%)

		Chile	Mexico	Panama[1]	Argentina	Venezuela	Brazil	Costa Rica	República Dominicana[2]	Colombia	Perú	El Salvador[2]	Bolivia
	Growth Rate 2000´s	1.99	0.16	-0.06	11.41	-4.68	-2.20	-2.87	11.76	-2.77	2.98	20.98	-7.43
2) Structural Change Indicators													
RLP	2011	47.92	42.94	5.94	36.49	27.41	33.26	46.05	58.50	46.47	47.43	18.17	37.29
	Growth Rate 80-11	0.72	-0.07	-0.86	-2.07	-0.63	0.79	0.07	-0.12	0.33	1.48	-0.32	1.33
	Growth Rate 2000´s	1.33	-1.06	-2.51	-2.23	0.75	0.70	-0.19	0.54	1.44	3.19	-1.98	2.47
RE	1980 – 2011	0.18	0.38	-0.23	-0.14	0.10	0.29	0.54	0.04	0.16	0.63	-0.39	-0.23
	2000 – 2011	-0.11	0.00	0.15	-0.11	0.10	0.39	0.18	-0.13	0.23	1.06	-0.88	-1.45
RE/ΔLP	1980 – 2011	29.16	-24.22	27.79	16.20	-11.16	-27.71	-47.11	-11.79	8.28	10.94	-16.17	5.09
	2000 – 2011	17.84	-7.72	30.10	12.77	-26.98	-26.14	45.60	-4.97	-18.85	8.61	-10.29	57.81
3) Growth Indicators													
y	2011	9,031	8,336	6,853	6,553	6,164	5,721	5,515	4,927	4,143	4,051	2,997	1,218
	Growth Rate 80-11	3.33	0.76	2.46	1.49	0.07	1.04	1.77	2.78	1.72	1.46	1.12	0.54
	Growth Rate 2000´s	3.00	0.98	4.49	3.23	1.75	2.46	2.38	3.79	2.76	4.32	1.49	2.00
	y_{2011}/y_{1980}	2.69	1.24	2.04	1.49	0.97	1.36	1.69	2.29	1.68	1.48	1.38	1.17
	y_{2011}/y_{2000}	1.35	1.10	1.70	1.46	1.16	1.30	1.34	1.49	1.35	1.65	1.16	1.27
LP	2011	17,931	22,752	14,154	14,355	17,180	11,398	11,492	11,345	9,289	10,040	7,039	2,544
	Growth Rate 80-11	1.15	0.27	1.30	0.97	-0.42	0.26	0.89	1.46	0.97	0.94	0.01	-0.45
	Growth Rate 2000's	0.86	1.43	3.00	1.41	1.89	0.88	1.22	2.63	1.37	3.37	0.47	0.62

Table 1.

Descriptive Facts on Income Distribution, Economic Growth and Structural Change for Latin American Countries (%)

		Chile	Mexico	Panama[1]	Argentina	Venezuela	Brazil	Costa Rica	República Dominicana[2]	Colombia	Perú	El Salvador[2]	Bolivia
4) Income Distribution Indicators													
GINI	$GINI_{2011}$ /$GINI_{1980}$	0.94	0.91	1.01	1.20	1.02	0.89	1.07	0.98	1.14	1.07	0.96	1.21
	$GINI_{2011}$ /$GINI_{2000}$	0.9	0.9	0.9	0.8	0.8	0.9	1.0	0.9	0.9	0.9	0.9	0.8
	Growth Rate 80-11	-0.2	-0.3	0.6	0.1	0.1	-0.4	0.2	0.0	0.6	0.4	-0.1	0.7
	Growth Rate 2000´s	-0.6	-0.9	-0.4	-1.4	-1.5	-0.9	0.6	-0.5	-0.4	-1.7	-1.1	-1.7

Source: Word Bank (2013): Per capita GDP (US$ of 2005; y); real value added (US % 2005); agriculture (S_{AGR}), manufacturing (S_{MAN}), services (S_{SERV}), exports of goods and services (S_{Xgs}), and export of manufactures (S_{XMAN}) shares out of GDP; real value added (US$ 2005); and the real value added and labor force shares of Panama, El Salvador and Dominican Republic. Conference Board (2013) LACs labor force. Labor productivity (LP) is the ratio of the real value added (US$ 2005) per worker. UN (2013): Mining and utilities (S_{MIN-UT}) share of the GDP. For the reallocation effect estimates (RE), the databases of the nine real value added and employment shares for nine LACs were University of Groningen (2013) (period 1980-2005), CEPAL (2013) for real value added shares (period 2006-2011), and SEDLAC (2013) for employment shares (period (2006-2011). Milanovic (2013), University of Texas Inequality Project (2013) and SEDLAC (2013) were the sources for the Gini coefficients. [1] The share of export of manufacturing of this country is up to 2010. [2] The RE and RLP estimates of for Dominican Republic is for period 1991-2011 and for El Salvador is the period 1990-2011.

Despite of those ID improvements, in seven of the twelve LACs, Gini coefficients in 2011 were higher than the corresponding level of 1980.

Third, regarding the sectoral output share indicators, since 1980 in eight out of twelve LACs, the output share of agriculture and manufacturing declined in favor of services. Only in Argentina, both output shares increased in the 2000s. By 2011, productive structure for the sample of LACs was still concentrated upon primary (agriculture and mining) and services sectors. Furthermore, in eight of these countries the share of manufactured exports out of total merchandize exports was less than 35%.

Fourth, in the long run period, in four LACs (i.e., Panama, Argentina, El Salvador and Bolivia) the reallocation effect indicator of structural change was negative. This means that labor moved from high to low labor productivity sectors, reducing labor productivity for these countries. In the medium run period, in five LACs (i.e., Chile Argentina, Dominican Republic, El Salvador and Bolivia) the reallocation effect remained negative. In the long run period, the SC indicator of ratio of labor productivities declined in half of LACs, implying that labor productivity gap among sectors increased. In the medium run period, the RLP declined in five LACs, four of them were the same countries of the long run period (i.e., Mexico, Panama, Argentina, and El Salvador). Also in both long and medium run periods, in half of the countries, the average contribution of the reallocation effect to the labor productivity growth was negative.

Summing up, the pattern of economic growth, income distribution and structural change has been diverse for the sample of LACs in period 1980-2011. In the first decade of this century, however, most of those countries (with the exception of Mexico) have experienced from moderate to high levels of per capita economic growth and declining income inequality. The structural change indicators, on the other hand, suggest, for most of these countries, that the domestic and export sectoral shares have not changed significantly despite of the fact that the share of the agricultural output has been declining (with the exception of Argentina). Industrialization through an increasing of the domestic and export output share of manufactures has not been a feature of the structural change in the sample of countries (with the exception of Mexico and to less extent Argentina). Services and

mining (including utilities) sectors are still the predominant sectors in the total output of most of the Latin American economies. Further, for all LACs there exists a notable labor productivity gap between the lowest and highest labor productivity sectors and in half of these countries structural change would seemed to be growth-reducing.[23]

4. INCOME DISTRIBUTION, ECONOMIC GROWTH AND STRUCTURAL CHANGE: EMPIRICAL EVIDENCE IN 12 LATIN AMERICAN COUNTRIES

There exists an abundant empirical literature that presents mixed evidence on the relationship between ID, EG and SC in both developing and developed counties. Eight studies of this literature, however, are relevant for the purposes of this section. Alejo (2013) analyzes the determinants of income distribution for Uruguay, Honduras, Costa Rica, Argentina and Brazil in period 1989-2009 and concludes that growth has not been the main cause of the evolution of inequality in these countries. In contrast, studies of Azevedo and associates (2012 and 2013) affirm that for period 1995-2010 for 14 LACs, the changes (particularly the decreasing trend in the last decade) of inequality has been originated mainly by the growth effects on labor income. In particular, most of the reduction in inequality can be attributed to an increase in earnings per hour for the bottom of the income distribution. On the other hand, in their analysis of period 2000-2010 for 14 LACs, Lustig, Lopez-Calva, and Ortiz-Juarez (2013) take a skeptical position and argue there is no clear link between the decline in inequality and economic growth. Inequality has declined in countries that have experienced rapid economic growth, such as Chile, Panama and Peru, and in countries with low-growth spells, such as Brazil and Mexico. Nor is there a link between falling inequality and the orientation of political regimes. Inequality has declined in countries governed by leftist regimes, such as Argentina, Bolivia, Brazil, and Venezuela, and in countries governed by centrist and center-right parties, such as Mexico and Peru.

Regarding structural change, in their review of ten studies on Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela in period 1970-1996, Reinhart and Peres (2000) conclude that in the LAC region, more changes have occurred at the micro level than is

[23] Similar results have been found by Rodrik and McMillan (2011), IADB (2010) and Timmer, de Vries, Erumbana, Voskoboynikova, and Wua (2012).

apparent at the aggregate level. The ten studies analyzed document a process of change at the firm level that is only moderately apparent in structural change between economic sectors. On the other hand, Rodrik and McMillan (2011) postulate that in period 1990-2005 structural change has been growth-reducing in both Africa and Latin America (which includes nine countries), with the most striking changes taking place in Latin America. The bulk of the difference between these countries' productivity performance and that of Asia is accounted for by differences in the pattern of structural change – with labour moving from low- to high-productivity sectors in Asia, but in the opposite direction in Latin America and Africa. Further, based upon models that link structural change to aggregate productivity (e.g., Restuccia and Duarte, 2010), Üngör (2011 and 2013) in his analysis of period 1974-2003, affirms that Latin American countries (nine of them) exhibited much slower de-agriculturalization than East Asian countries, while the manufacturing employment share has been almost stagnant. These differences may be explained by the low agricultural productivity growth and the subsistence constraint of the agriculture sector in Latin America.

The differences in the results of these studies can be best understood through a causality analysis of relationships between ID, EG and SC for a sample of 12 LACs for period 1980-2011. The basis ad-hoc specification used is the following:

$$\Delta \ln ID_{jt} = \beta_{0j} + \beta_{1j}.SC_{jt} + \beta_{2j}.\Delta \ln y_{jt} + \beta_{3j}.(\Delta \ln y_{jt})^2 + \varepsilon_{jt} \; ; \quad j=1, 12; \; t=1980\text{-}2011$$ [24]

Wherein Δ and ln are respectively the rate of change operator and the natural logarithm of the variable. ID is the Gini coefficient. SC is a measure of structural change. For most of the countries, two measures were used: the between or reallocation effect (RE) component of the rate of growth of labor productivity and the share of the agriculture output out of the real value added of an economy (S_{AGR}). 'y' is the real gross domestic value per capita. The last and quadratic term of the right hand side of the specification captures the potential non-linearity of the specification.

[24] For that period and each country, unit roots were implemented for this set of dependent and independent variables rejecting the null hypotheses of existence of a common unit root among these variables.

The specification assumes that causality goes from EG and SC to ID. Table 2, however, provides the group causality tests to verify the directionality of causality using a vector of autoregression of '1' lag[25]. In this Table, X means the set of variables causing each of the three variables ΔlnID, Δlnyt, and SC. It should be noted that for the causality of X on $lnID_{jt}$ the relevant variables are $RE_{j(t-1)}$, $S_{AGRj(t-1)}$, and $lny_{j(t-1)}$. Table 3 provides the coefficients with their respective level of significance of the relevant specifications according to the causality results of Table 2 wherein a coefficient of value one corresponds to the endogenous variable of that specification.

Consistent with the theoretical links and empirical evidence, the causality tests indicate varied results. Thus, in the case of Chile and Mexico[26] EG and SC caused ID. For Peru, causality runs from ID, SC to EG. For Colombia, Costa Rica, El Salvador and Bolivia, the links is from EG, ID to SC. Depending upon the indicators used, bi-causality results were also found between EG and ID for the case of Venezuela and Argentina, ID and SC for the case of Panama and Brazil. Looking at the statistical significance of the coefficients of Table 3 and the causality results of Table 2, several features of the growth, structural change and income distribution links can be draw upon:

i) Consistent with absence of a significant structural change or development process at the sectoral and aggregate level for the sample of Latin American Countries, only in four countries (Argentina, Mexico, Panama and Venezuela) indicators of SC had an statistical impact on income inequality. Further, in the case of Panama and Venezuela the results indicate perverse structural change effects on ID. Data from SEDLAC (2013) indicates that close to half of the labor force was engaged in informal activities in such countries[27]. Thus, despite of the fact that labor reallocates from low to high labor productivity sectors (as was the case in the 2000s decade for Venezuela and Panama), if that labor went to the informal

[25] This lag was common for all the VAR estimations. In general, lag criterion tests (i.e., sequential modified likelihood Ratio, Akaike information criterion and others) applied for each VAR estimation and country produced a lag length of one, although not for all the cases.

[26] Similar results were found for Mexico by Risso, Punzo, and Sánchez Carrera (2013) using different database and econometric techniques and period of analysis (1968–2010).

[27] For SEDLAC (2013) a worker is considered informal if (s)he is a salaried workers in a small firm, a non-professional self-employed, or a zero-income worker. A firm is considered small if it employs less than 5 workers.

activities of the sectors income distribution not necessarily would have improved. In the case of Argentina, the increase of the agriculture real value added share and the decline for the respective share in Mexico, in the 2000s decade, helped to improve the income distribution of these countries. The effect of SC on EG was evidenced only for the case of Peru. Its process of de-agriculturalization although relative low in the first decade of this century, was carried out with relative higher level of productivity and incomes (documented by Webb, 2013), which may have contributed to the high rate of per capita GDP growth in such period. This de-agriculturalization, however, did not alter the degree of inequality of the Peruvian economy, which remained constant in the long run period (Mendoza, Leyva and Flor, 2011). For the rest of LACs, structural change did not affected in a significant statistical way the growth process.

ii) Similarly, consistent with the mixed results of relationship between economic growth and inequality mentioned above, the statistical evidence (i.e., causality tests and var coefficients) suggests that positive economic growth caused and did reduce inequality for Argentina, Chile, Panama, and Venezuela. The evidence was not clear for Brazil, which indicates that growth increased inequality in Brazil. The studies of Serrano and Summa (2011), Hailu (2009), Veras, Soares, Medeiros and Osorio (2006), and Arraes and Diniz (2004) provide complementary explanation to this statistical result.

Table 2 χ^2 Causality Tests Between ID, EG, SC, 1980-2011

Country	Null Ho	X ⇏ dlnID	X ⇏ dlny	X ⇏ SC
Chile	RE	10.23**	1.27	2.08
	S_{AGR}	10.16**	5.20	6.80*
Argentina	RE	3.72	17.64***	1.13
	S_{AGR}	9.68**	16.04***	2.52
Mexico	RE	2.03	2.52	5.16
	S_{AGR}	9.01**	3.43	2.35
Panama	RE	7.33*	3.97	6.36*
	S_{AGR}	4.07	4.62	11.39***
Venezuela	RE	7.48*	6.27*	1.60
	S_{AGR}	1.73	6.12	5.69
Brazil	RE	8.63**	1.26	6.29*
	S_{AGR}	9.11**	0.87	1.84
Costa Rica	RE	0.12	0.74	9.34**
	S_{AGR}	2.03	2.91	51.54***
	$dlnS_{AGR}$	0.05	0.356	58.120***
Dominican R.	RE	2.99	4.57	4.68
	S_{AGR}	1.33	2.66	2.15(6.98*)
	$dlnS_{AGR}$	0.63(0.73)	5.78(2.65)	6.01(0.73)
Colombia	RE	0.83	2.46	10.24**
	S_{AGR}	0.90	2.73	59.41***
	$dlnS_{AGR}$	1.37	1.70	98.03***
Perú	RE	2.18	7.40*	3.75
	S_{AGR}	2.34	3.23	2.23
El Salvador	RE	1.22	1.67	12.92***
	S_{AGR}	2.41	1.98	3.93
Bolivia	RE	5.07	1.34	0.97
	S_{AGR}	3.52	4.04	21.34***

Source: Table 1. [1] The number within parentheses use labor productivity (LP) instead of per capita GDP (y) in the respective causality tests.

Table 3. Regression Coefficients of the VAR Between ID, EG and SC for LACs, 1980-2011

Country	$dlnID_t$	$dlnID_{t-1}$	$dlny_t$	$dlny_{t-1}$	$(dlny_{t-1})^2$	RE_t	RE_{t-1}	S_{AGRt}	S_{AGRt-1}	R^2-Adj	F-Test
Chile											
RE	1.0	-0.010		-0.124*	0.016**		0.088			0.201	2.826**
S_{AGR}	1.0	0.005		-0.100*	0.017*				-0.032	0.199	2.805**
S_{AGR}		0.039		-0.092**	-0.007**			1.0	1.066***	0.875	51.599***
Argentina											
RE		-1.146**	1.0	0.206	0.071***		-1.222			0.402	5.873***
S_{AGR}	1.0	-0.039		-0.108*	-0.009				-0.497**	0.209	2.913**
S_{AGR}		-1.166*	1.0	0.142	0.062**				0.303	0.379	5.419***
Mexico											
S_{AGRI}	1.0	-0.505***		0.086	-0.013				0.413***	0.239	3.281**
Panama											
RE	1.0	-0.220		-0.259**	-0.016*		0.339**			0.125	2.037*
RE		-0.031		0.367**	0.0127	1.0	-0.352*			0.097	1.782
S_{AGR}		0.022		-0.057***	-0.001			1.0	0.963***	0.922	86.315***
Venezuela											
RE	1.0	0.007		-0.177*	-0.005		0.766***			0.117	1.964
RE		-0.338	1.0	0.088	0.044**		0.170				
Brasil											
RE	1.0	0.094		0.091	0.047**		0.187			0.146	2.237*
RE		0.127		0.126**	-0.014	1.0	0.017			0.092	1.737
S_{AGR}	1.0	0.029		0.088	0.047**				0.149	0.158	2.358*
Costa Rica											
RE		-0.285**		0.142*	0.009	1.0	-0.079			0.171	2.500*
S_{AGR}		0.103		0.202***	-0.076***			1.0	1.081***	0.897	64.276***
$dlnS_{AGR}$		0.322		0.570*	-0.443***			1.0	0.179**	0.651	14.532***
Dominican Republic.[1]											
SAGR		-0.032		-0.070	0.038***			1.0	0.839***	0.821	34.266***
dlnSAGRI		-0.275		-0.300	0.042			1.0	-0.737***	0.522	8.928***
Colombia											
RE		-0.109**		0.167*	0.021	1.0	-0.437***			0.337	4.689***
S_{AGR}		0.100***		0.254***	-0.068**			1.0	0.963***	0.975	289.311***
$dlnS_{AGR}$		0.715***		2.341***	-0.622***			1.0	0.026	0.768	24.956***
Perú											
RE		-0.135	1.0	0.483***	0.020		-2.079***			0.3701	3.673***
El Salvador											
RE		0.147**		0.095	0.057**	1.0	0.086			0.366	3.886***
Bolivia											
S_{AGR}		0.066**		-0.169**	0.046**			1.0	0.621***	0.855	43.594***

Source: Table 1. [1] The per capita GDP independent variable y was replaced by labor productivity for this country.

On the one hand, Hailu (2009) and Veras, Soares, Medeiros, and Osorio (2006) affirm that about two-thirds of the fall in the Gini coefficient since 2001 in Brazil can be attributed to direct cash transfers programs from the state to families, and individuals decline in family size, improvements in family dependency ratios, and access to education from 1995. Part of this result is confirmed by the households' analysis of Arraes and Diniz (2004). Further, in this study, a higher rate of growth of the national GDP than the state GDP rate of growth would increase inequality (i.e., it would increase the variation coefficient of households state incomes). On the other hand, Serrano and Summa (2011) postulated that Brazil's inequality has dropped continuously over the decade since that prior to 2004 this was accompanied by a fall in higher-wage incomes and an increase in the wages of poorer workers. After 2004, average household incomes started to grow not only because of faster growth of the economy and of formal employment, but also because by then the real minimum wage grew even faster. The positive effects of reducing inequality on economic growth only were found for Argentina for both indicators of structural change.

iii) The coverage of the causal effects of growth and/or inequality on structural change has been greater than the respective of former links. Seven countries experienced those causal effects. Thus, in the 2000´s declining of inequality did increase the reallocation of labor from low to high labor productivity sectors for Costa Rica and Colombia. In the case of El Salvador the decrease of inequality in such decade produced the reverse reallocation effect of labor moving from the high labor productivity sector (i.e., industry) to the low labor productivity sectors (agriculture and services). This result may be explained by the high labor share of workers engaged in informal activities. In period 1991-2004, around 55% of the labor force was engaged in informal activities (SEDLAC, 2013). Moreover, the average share increased in period 2005-2010 to 57.6%. Most of this labor force works in services and agriculture activities. The declining of inequality in the 2000s also caused a decline of the agricultural share for Colombia and Bolivia.

On the other hand, positive economic growth caused an increase of the labor reallocation effect for Panama, Brazil, Costa Rica, Colombia and El Salvador, and a decline of the agricultural output share for Chile, Panama, and Bolivia. These reallocation and sectoral changes effects were due to the growth of the exports in primary products (particularly

mining in Panama and Brazil) and the increase of the services sector for Chile and Costa Rica. The two special cases were Colombia and Costa Rica. Given the unit root feature of the output share of the agricultural sector of these economies, causality and VAR estimates were obtained with the rate of change of that share. These statistical results suggest there were an inverted U shape relationship between economic growth and the rate of change of agriculture share. For low levels of per capita growth (e.g., lower than 1.3% for both countries) the respective agriculture share would increase. However, the average per capita GDP rate of growth for both countries was higher than 2% for the 2000s, which implied with such rates the share of agriculture were also declining.

5. CONCLUSIONS

Subject to data limitations, indicators and econometric techniques used, this paper has presented evidence on the relationship between income distribution, economic growth and structural change for a sample of twelve Latin American Countries for period 1980-2011. This evidence is consistent with the variety of empirical and theoretical links found in the literature.

The heterogeneity of the countries in terms of: productive structure, institutional environment, economic policy, size of the informal sector, and market-government failures and other aspects that hinge in the economic development process may explain the difference of the links between these three development aspects found in the experience of Latin American countries. Moreover, differences in causal relationships among these aspects may provide information on the types of economic and institutional policies prescriptions that are required to achieve economic development. For example, in the absence of causal relationship going from economic growth to income distribution and structural change, growth policies may be effective to spur the rate of growth of per capita GDP but it may not be for improving income distribution and/or to produce structural change in the economy. This absence of links seems to be experimented by Argentina, Mexico, Dominican Republic, Peru, and Bolivia when reallocation of labor from low to high labor productivity sectors is taken as a measure of structural change.

Despite of the heterogeneity of the economies, the evidence presents a series of common regularities of the development process in the Latin American region. First, at the sectoral and macro level, structural change (in terms of reallocation of resources toward modern activities and away from primary and/or low productivity sectors) has not been significant in the last three decades for the sample of Latin American economies. This has implied, on the one hand, that only in four countries (Argentina, Mexico, Panama and Venezuela), indicators of structural change have had a statistical impact on inequality. However, in the cases of Panama and Venezuela, this impact has been perverse, increasing rather than decreasing inequality. The high share of labor force engaged in informal activities in these countries may explain this result.

On the other hand, that in one country (Peru) the labor reallocation measure of structural change has had a statistical and positive impact on economic growth. Thus, in contrast to the thesis of Rodrik and McMillan (2013), for most LACs this measure has not been growth-augmenting nor reducing in causal statistical terms. The absence of a statistical causal relationship from structural change to economic growth may be attributed to the fact that the sectoral labor reallocation measure does not take into account informal activities. Recently, Timmer, de Vries, Erumbana, Voskoboynikova and Wua (2012) conclude that when these informal activities are taken into account, the magnitude of reallocation effect is greater and produce growth-enhancing effects. That was the case for Brazil in period 2002-2008.

Second, in countries (i.e., six out of the twelve LACs) wherein economic growth and/or structural change statistically caused inequality, the relative low level of the goodness of fit of the regressions results suggest that 'other factors', particularly economic policies, may explain in a greater proportion the improvement of equality experienced for LACs in period 2000-2011. Dastidar (2004) and Squire and Lundberg (2003) provide similar arguments in favor of 'other factors' affecting the degree of inequality of the countries.

Lastly, the coverage of the causal effects of growth and/or inequality on structural change has been greater than the respective coverage of the effects of structural change on inequality and/or economic growth. Seven Latin American countries experienced these

effects. Specifically, demand growth-effects were statistically important for the reallocation of labor from low to high labor productivity sectors for countries like Panama, Brazil, Costa Rica and Colombia. On the other hand, the declining of inequality has encouraged the positive reallocation of labor in Colombia.

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