Distribution, Structural Change and Economic Performance in Settler Societies, 1870-2000

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1. Introduction
This paper is written by people from the South of the Americas. The underlying problem is the relative failure of South American Settler Societies to keep pace with the growth performance of other settler societies, and their steady decline in the international per capita GDP ranking. Even if, Chile has been recently considered as a case of partial success, in the long-run all the Latin American countries, which by the mid-1800 century could be considered as settler societies, have been failing to grow at steady high rates and fairly improve the quality of life of the population.

The paper adopts a comparative perspective in order to find relevant differences in the pattern of growth of different settler societies, and to explain the varied outcomes.

The attempt to link economic growth to the distribution of income has many antecedents. While the Kuznetsian tradition focused mainly on the causality from growth and structural change on income distribution, the inverse causality has been the core of recent research. This paper will mainly explore this second line of causality.

With respect to structural change, an intensive debate has taken place. The Latin American debate has been intensive and has recently increased hand in hand with the development of new ideas in the front of development economics, inspired by Post-Keynesian, Schumpeterian and Evolutionary economics. While structural change seems to be considered as a natural outcome of economic growth by mainstream economics, the other referred theories seem to point towards the need for structural change in order to make growth possible. This latter line of research also inspires the present paper.

However, the relation between structural change and income distribution in the process of economic growth has not been an important topic. This is the third line of research, which we will try to follow. Our hypothesis bolds down to the idea that an uneven income and wealth distribution poses limits to structural change in different ways. One of them, the pattern of demand growth, will be especially considered here.

Finally, settler societies have some particularities of their own. Resource-abundant, labour-scarce regions constitute specific scenarios on which the interplay between growth, income distribution and specialization takes place.

The following second section tackles the theoretical debate and presents a theoretical model. The third section presents some stylized facts about settler societies. Section 4 presents the results of a simple model, which considers productive specialization, as the result of original income distribution. Section 5 makes a brief consideration on the relative development of industry in settler societies during the first decades of the 20th Century.
Section 6 presents a more complex model to tackle the relation between inequality, specialization, trade and performance. We conclude with a few remarks.

2. Theory and antecedents

Income distribution and growth

Until about one decade ago, the dominant approach to income distribution was the Kuznetsian one (Kuznets, 1955), which stylized the well-known inverted “U”-curve. His sectoral approach had some similarities with the way in which Lewis approached the specific case of developing economies with unlimited supplies of labour: they were expected to grow with increasing inequality during the traditional phase of growth, until the labour reservoir was absorbed and wages started to grow in the commercial phase (Lewis, 1954).

After considerable research, the attempt to transform Kuznets’ stylized facts into an “economic law” seems to have failed: according to Deininger and Squire (1998), on a country by country basis, the existence of the curve is rejected in 90% of the cases. This does not mean that the Kuznetsian approach (consisting in the study of how structural change and a wide range of social, institutional, demographic and other factors -not considered by economists as the proper field of economics- impacts on income distribution) is old-fashioned or fruitless (Bértola, 2005).

Galor & Zeira (1993), Persson & Tabellini (1994) and Alesina & Rodrik (1994) were among the first contributors, who stressed the negative impact of income inequality on economic growth. Some kind of consensus seems to exist around the idea that while high income inequality at the starting point of a growth process not necessarily leads to a poor economic performance, high inequality in the distribution of wealth does (Deininger and Squire, 1998).

The pioneering approaches to how inequality affects growth, are: i) political economy (Alesina & Rodrik, 1994; Bertola 1993; Persson & Tabellini, 1994; Alesina & Perotti, 1996); ii) imperfect capital markets (Galor & Zeira; 1993; Banerjee & Newman, 1993; Ferreira, 1995; Galor y Zeira, 1993; Aghion & Bolton, 1997; Banerjee & Newman, 1991); iii) social conflicts (Alesina & Perotti, 1996; Rodrik, 1997; Fajnzylber, Lederman & Loayza, 1998; Bourguignon, 1998), and iv) endogenous fecundity (Dahan y Tsiddon, 1998; Galor y Zang, 1997; Morand, 1999; Galor y Weil, 1996).

More recently, some authors, as Lundberg & Squire (2001) and Fielding & Torres (2005), argued that inequality and growth were two parts of the same process with reciprocal
causalities. “Our main result is to show that the determinants of growth and inequality are not mutually exclusive. The consequences of policy choices are then much broader than previously assumed” (Lundberg & Squire: 2001:15).

From the field of economic history, neo-institutionalist thinking has revived old development theories with institutionalist and structuralist flavour. The concept of path-dependence points to deep historical roots explaining patterns of institutional building and distribution of wealth, which lead to economic institutions with structures of incentives more oriented towards the extraction of rents than to innovation (Engerman & Sokoloff, 2000; Acemouglu, Johnson & Robinson 2001, 2002, 2005; World Bank, 2004).

Specialization and growth
The idea that specialisation is not neutral for growth has deep roots in the history of economic thought. Since Ricardo, at least, the idea that manufacturing gives more opportunities for technological change has been present in one way or another in the work of many scholars and in policy making.

This idea has been at the centre of Latin American thinking on development. Industrialization was, in the work of Prebisch, the central goal, as technical progress advanced more rapidly in the industrial sector and because demand tended to shift from primary production to more sophisticated manufactures and services (ECLA, 1949). ECLAC’s works, since the 1990s, have been strongly influenced by Fernando Fajnzylber’s fruitful production (1983 and 1987). Fajnzylber shifted to an approach based on “systemic competitiveness”, in the sense that a diversified productive structure and export sector should not reproduce traditional dualist structures, but needed a rather homogeneous productive sector with significant domestic innovative cores.

ECLAC’s production since the 1990s has been clearly influenced by Post-Keynesian thinking á la Kaldor-Thirlwall, by neo-institutionalist ideas, as well as by Neo-Schumpeterian and Evolutionary theories, as those of Nelson & Winter, Freeman, Soete, Pérez, Vespagen, Cimoli, etc. Along this line of research, hard criticisms have been directed towards the structural reforms introduced in Latin America since the 1980s. Liberal reforms led to a degradation of the structure of production and exports of Latin America towards items with lower value-added and technological content, leading to high volatility and a continued relative retardation (ECLAC, 2004; Cimoli et al., 2005). A long-run study of the Southern Cone countries along these lines is presented in Bértola & Porcile (2006).
Specialization and income distribution

The link between specialization and income distribution has been rarely tackled, but has been the object of recent developments.

The distribution of income has an important impact on demand patterns, as different income groups have different structures of demand. In Figure 1 we present a hypothetic structure of demand derived from the distribution of personal income.

Following Engel’s Law and Kindelberger (1989), who means that Engel’s Law may be considered a law on consumption and not only on alimentation, low-income groups spend most part of their incomes in the satisfaction of basic needs, as foodstuffs, clothes and housing. On the contrary, high-income groups are supposed to save and invest, and their pattern of consumption is more intensive in luxury goods, services and high-tech goods. Thus, the structure of aggregate demand of all income groups (some kind of “average” demand) will be shaped by the weight of each income group. The usual assumption on unitary income elasticity of demand for all goods gives thus place to non-homothetic preferences. This approach is highly sensible to historical contexts, as the income elasticity of demand for different goods may shift considerably through time, due to changes in average income, technology, relative prices, etc. (Rowthorn & Wells, 1987).

Figure 1: Distribution and demand: an illustration
Following this idea, Mani & Hwang (2001) argue that countries facing high inequality have to meet a wide variety of products (the simplest and the most sophisticated ones) for which demand is relatively small. As international competitiveness is assumed to develop as an extension of production for the home-market in a process of cumulative learning, the potential for a learning process in the production of high-tech goods is rather limited. This turns into a restriction on the development of skills, returns to skill, economic growth and increased per capita income. The transition to a stage featured by high per capita income is thus endogenously limited (Mani 2000).

Zweimüller (2000) argues in a similar way: when income is highly concentrated the potential market for a new product is rather small and it takes a long time until mass-consumption is possible. The expected returns to innovations are low, which delays technical progress and productivity growth.

When wealth inequality is considered, landownership for instance, the path of development may shift from a situation in which high income-inequality fuels growth, to another in which it refrains growth. This is, according to Thorp (1998), the case of the Latin American countries, as the patterns of unequal wealth-distribution were consolidated in the growth process. The process of industrialization is hindered by institutions oriented towards the extraction of natural rents, rather than those oriented to physical and human capital accumulation (Galor, Moav & Vollrath, 2004). The reversal of fortune is highlighted by Engerman & Sokolof (2000) and Acemoglu, Johnson & Robinson (2002).

It is also possible to argue, that the impact of the structure of demand on growth occurs not only at the national level, but also internationally. Income distribution affects the way in which countries specialize and in which technical progress and productivity can advance. Even more, an unequal world economy may show lower growth rates than an equal one. A link between the presented approach and the idea of club convergence developed by Quah (1993 a y b, 1996) seems attractive. Figure 2 illustrates the referred relations.
3. Settler economies 1870-2000: some stylized facts

By the year 1900, Australia, New Zealand and the USA were the world top-ranked nations in terms of per capita income. Argentina, Canada, Chile and Uruguay had also a high position in the world ranking, and looked like countries with a promising future. South Africa was still at low levels of per capita income.

As shown in Figures 3 and 4, this group of countries experienced some kind of convergence until the 1930s, with a decreasing standard deviation of per capita incomes within the group, due to the declining Australasian position and the good performance of Argentina and Canada. Afterwards both Australasian countries, Canada and the USA increased their growth rates in relation to the others and the gap widened. By the 1970s the dispersion of per capita incomes had surpassed the levels of 100 years ago and continued to increase. As well-known, the USA strengthened their leadership, being Canada the only country that kept a similar growth rate, without converging in absolute terms. The Southern Cone countries did it relatively bad, and their position in the world ranking worsened significantly. South Africa did it even worse.
As shown in Table 1, average growth rates were clearly higher in 1870-1913. In 1913-1929 Argentina and Australia were the only countries showing negative growth rates (New Zealand was stagnating). In the 1930s, Australia and New Zealand were the only countries showing positive growth-rates. Even more, their growth rates were the highest of the whole period 1870-1940. Without any doubt, the imperial preferences established by the Agreement of Ottawa in 1932 benefited the Commonwealth countries as much as they damaged the countries of outside it.

<table>
<thead>
<tr>
<th>Year</th>
<th>Argentina</th>
<th>Australia</th>
<th>Canada</th>
<th>Chile</th>
<th>USA</th>
<th>New Zealand</th>
<th>South Africa</th>
<th>Uruguay</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>1,311</td>
<td>3,946</td>
<td>1,710</td>
<td>1,151</td>
<td>2,454</td>
<td>3,100</td>
<td>858</td>
<td>2,225</td>
<td>2,094</td>
</tr>
<tr>
<td>1938</td>
<td>4,069</td>
<td>5,886</td>
<td>4,545</td>
<td>3,134</td>
<td>6,126</td>
<td>6,463</td>
<td>2,184</td>
<td>3,723</td>
<td>4,516</td>
</tr>
</tbody>
</table>


As shown in Table 2, by the 1870s, all countries had a structure of exports completely dominated by primary production and their exports amounted to more than 15% of GDP. The USA already showed some different features: a somewhat lower export-coefficient and a more diversified structure of exports. By 1900, average export-coefficients had increased, being the USA the only exception. Both the USA and Canada further diversified their exports, but Australasian and the Latin-American Southern Cone do not break their trends.
### Table 2

**SHARE OF PRIMARY PRODUCTS IN TOTAL EXPORTS AND SHARE OF TOTAL EXPORTS IN GDP**  

<table>
<thead>
<tr>
<th>Primary products % total exports</th>
<th>Exports % GDP</th>
<th>Primary products % total exports</th>
<th>Exports % GDP</th>
<th>Primary products % total exports</th>
<th>Exports % GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>100</td>
<td>15</td>
<td>99</td>
<td>19</td>
<td>99</td>
</tr>
<tr>
<td>Australia</td>
<td>97</td>
<td>15</td>
<td>97</td>
<td>20</td>
<td>96</td>
</tr>
<tr>
<td>Chile</td>
<td>99</td>
<td>22</td>
<td>99</td>
<td>19</td>
<td>100</td>
</tr>
<tr>
<td>Canada</td>
<td>95</td>
<td>12</td>
<td>91</td>
<td>15</td>
<td>74</td>
</tr>
<tr>
<td>USA</td>
<td>86</td>
<td>6</td>
<td>80</td>
<td>6</td>
<td>57</td>
</tr>
<tr>
<td>New Zealand</td>
<td>99</td>
<td>16</td>
<td>96</td>
<td>23</td>
<td>99</td>
</tr>
<tr>
<td>Uruguay</td>
<td>100</td>
<td>22</td>
<td>100</td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>

Primary products: *live animals*, *foods and drinks*, *raw materials or simply-prepared products*  

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### 4. Distribution and specialization: a simple model

In order to explain why some countries were able to keep high growth rates in the second part of the 20th Century, we will test the hypothesis that a more unequal distribution of income limited the process of structural change, thus keeping those countries dependent on traditional primary exports.

Following O’Rourke, Taylor & Williamson (1996), O’Rourke & Williamson (1994), O’Rourke & Williamson (1999 a and b), Williamson (1997) and Williamson (2000), Bértola y Porcile (2002); Bértola y Williamson (2003); Greasley & Oxley (2001 a and b) we will use the wage/rental ratio as a proxy for income distribution.

Specialization is proxied by the share of agrarian export to GDP each fifth year since WWII.

The following models are tested:

\[ AX_t = \beta_0 + \beta_1 [WR_t - WR_0] + u_t \]

\[ APS_t = \beta_0 + \beta_1 [WR_t - WR_0] + u_t \]

Were:

\( AX_t \): share of agrarian exports on total exports in period \( t \), when \( t = 1940, 1945, ..., 1995 \).

\( APS_t \): share of agrarian value added in GDP in period \( t \); when \( t = 1940, 1945, ..., 1995 \) (represents the agrarian productive structure of the economy).

\( WR_t \): the rental/wage ratio \( t \), con \( t = 1940, 1945, ..., 1995 \).

\( WR_0 \): the original (0) rental/wage ratio; when 0 is the first available information since 1870.

When \( WR_t - WR_0 > 0 \), income distribution improves.
Figures 5 and 6 show a negative correlation between the variables, i.e., when income distribution worsened, a higher share of primary exports, alternatively a higher share of the agrarian sector, is found. In other words, it may be concluded that economies with better distribution of income are expected to go through a deeper structural transformation. The statistical significance is weak so the exercise is far from being conclusive.

5. Income distribution and industrial growth

In the previous section, we saw how income inequality at the starting point, may hinder diversification and growth. The study of the features of the manufacturing industry in different settler societies may give some idea about the relation between income inequality and industrial growth. Besides, even if most settler economies still were primary exporters during the first decades of the 20th Century, the features of the manufacturing sector may give an idea of the potential for diversification of exports.

Tables 3 and 4 contain information about different variables related with manufacturing performance: share production by principal branches, power installed and employment. For all variables, the differences between the English-speaking countries, on one side, and Argentina and Uruguay, on the other, are very clear. In terms of horse-power and number of workers per establishment, the first group of countries is far more developed than the other one. If we look at the structure of manufacturing, we can see that the weight of those sectors that Pavitt (1984) once considered as carriers and diffusers of technology are clearly more developed in the first group of countries than in the South American group. These differences increased during the first decades of the 20th Century.
6. A more complex model: settler societies 1940-2000

In this section, we will work with a wider sample of countries, which also includes non-settler societies, that can be considered, during most part of the period 1870-2000, the main importers of settler countries exports.

We will adapt the Mani & Hwang (2001) model, to cover factors considered relevant for this research. The variables included in the model are as follows:

- **AX**: ratio of agrarian exports to total exports.
- **APS**: share of agrarian value added in GDP.
- **GIL**: Gini-coefficient of land ownership distribution.
- **GII**: Gini-coefficient of income distribution.
- **PL**: stock of pasture and permanently cultivated land per capita.
- HK: stock of human capital.
- PK: stock of physical capital.
- OP: index of openness.

The relation tested with panel data is as follows:

\[ AX_{i\; t+j} = \beta_0 + \beta_1.GIL_{i\; t+j} + \beta_2.GII_{i\; t+j} + \beta_3.PCL_{i\; t+j} + \beta_4.HK_{i\; t+j} + \beta_5.FK_{i\; t+j} + \beta_6.OP_{i\; t+j} \]

\[ EPA_{i\; t+j} = \beta_0 + \beta_1.GIL_{i\; t+j} + \beta_2.GII_{i\; t+j} + \beta_3.PCL_{i\; t+j} + \beta_4.HK_{i\; t+j} + \beta_5.FK_{i\; t+j} + \beta_6.OP_{i\; t+j} \]

Where \( i \) represents each of the countries in the sample (the “relevant world”), \( t \) is the initial year of each sub-period (1940, 1945, 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990 and 1995) and \( t+j \) the final year, with \( j=4 \).

The evidence suggests that high levels of inequality are positively related to the persistence over time of high agrarian export-shares and agriculture to GDP shares: the estimated coefficients for income and wealth inequality are in most cases positive and highly significant (see Table 5).

Specialisation in agrarian production is positively correlated with a high level of natural resources (Models I, II, III and IV) and negatively correlated to human capital and economic openness (Models II and IV). This is valid as long as we consider income as a proxy for inequality, but not when we consider landownership.

Physical capital accumulation is significant to explain specialization (Models II, III and IV), but the sign is not always negative, as theoretically expected, when a lag is not introduced. In the case of agrarian trade-specialization, the sign is positive (Model II); in the case of agrarian production the relation is negative (Model III). This latter result
allows us to argue that export activities need physical capital accumulation for their success (railways, bridges, ports and infrastructure in general). The situation is different in the case of the agrarian activity, where the intensity of capital is lower than in other sectors (as manufacturing or construction). In agriculture, lagged physical capital is significant. It points to the fact that, once the economy reaches high levels of physical capital-accumulation, agricultural production tends to decrease in the future.

The fact that the distribution of land ownership has little explanatory power would suggest, as a first approach, that it is the generation of income flows, acting jointly with the incorporation of capital –in its various modalities–, that creates the dynamics of demand that impacts on trade and productive specialisation. It is also possible, that even in countries where competitiveness still is highly dependent on natural resources, forms of capital ownership other than land may be more significant for the distribution of income (financial assets, urban property, industries processing primary products, etc.).

**Final remarks**

Settler Economies of temperate climate producing primary products for the buoyant demand of the industrialized world ranked among the wealthiest in the universe by 1900. Turner (1903) considered the open frontier to be a guarantee for democracy, freedom and equity. The prospects for these countries were optimistic.

By the 1930s the club of settler societies belonging to what we can call the Atlantic Economy, started to disperse. The South American countries lagged behind.

In this paper, we tried to explore the idea, that income and wealth distribution could have an impact on the pattern of productive and trade specialization. In turn, productive and trade specialisation were considered to be important factors in order to explain technological change, productivity growth and economic performance.

A simple model was tested for 6 settler economies, in which it was assumed that inequality trends since the late 1870s, proxied by the wage-rental ratios, could explain trade and productive specialization since the 1940s, assuming that agrarian societies and primary exporters show lower levels of per capita GDP. Our results are not conclusive, but seem to validate our point. A brief analysis of some features of the manufacturing sector in 1910-1940, also points to a close relation between inequality and productive diversification.

A second and more comprehensive model was tested for 1940-2000. In this case the sample was extended to include more settler economies as well as other countries, which were the main importers of settler countries exports. Income distribution was approached by
menas of the Gini-coefficients for income and land-ownership. Other variables were included, which were considered as proxies for economic performance, as openness and physical and human capital. The productive structure was also measured in terms of the ratio of natural resources to population.

The evidence presented in this study shows that there is a positive relation between inequality and productive-trade specialization in low added-value goods. These results are partly understood, as the impact of an aggregate demand split in a wide variety of goods, which restricts competitive learning and leads to low-yield behaviour in technological innovation. This is also connected to the consolidation of institutions that tend to reinforce in a path-dependent way patterns of distribution of income and wealth strongly linked to natural resources. These once successful structures, turned to blockade structural change and technical progress towards industrialization and the diversification of exports.

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Appendix: Sources and construction of variables

For the econometric model the sources and variables used are the following.

AX: the ratio of agrarian exports in total exports, includes live animals, foods and drinks, tobacco, raw materials (except petroleum, coal and products), animal and vegetal fats and oils. The data is for 5-year periods. UN Yearbooks (several issues) and UN website.

APS: share of agrarian value added in GDP. The share of agrarian (agriculture and livestock) value added in total GDP at current prices. Mitchell (1993 a, b, c) and National Accounts for each country.


HK: stock of human capital. This indicator is constructed as a weighted average of gross enrolment rates at primary, secondary and tertiary education (the coefficients are 1, 1.4 and 2, respectively). For 1971-2000, with data from Word Bank-UNESCO website. For 1940-1969, own estimates based on Mitchell (1993 a, b, c).

PK: stock of physical capital. 10-year moving average of the investment rate. Data: PWT 6.1, Mitchell (1993 a, b, c) and National Accounts of each country.

OP: index of openness: a binary indicator of openness (1) and closeness (0): 5-year averages. Data from Sachs & Warner (1995) and CID at Harvard, Sachs & Warner, Trade Openness Indicators.