Distributive patterns in settler economies: agricultural income inequality during the First Globalization (1870-1913)

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1. INTRODUCTION: SETTLER ECONOMIES, THE FIRST GLOBALIZATION AND STYLIZED FACTS

During the First Globalization from the mid-19th century to the 1910s, the «settler club» –Argentina, Australia, Canada, Chile, New Zealand and Uruguay– had a development pattern characterized by strong primary sector export-led growth and increasing income inequality. In the closing decades of the 19th century, economic growth was encouraged by the export of primary products like leather, wool, meat, wheat, and in some cases Minerals, and the abundance of natural resources was a «blessing» for productive expansion[1]. But this blessing also contained a «curse» in that income distribution worsened and specialization in primary production adversely affected the expansion of incipient artisan and basic manufactures, a process that Williamson (2004) calls de-industrialization.

Standard trade theory (in the tradition of the Stolper-Samuelson theorem from Heckscher-Ohlin theory) predicts that free trade will raise the income of agents that own

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1. LLOYD and METZER (2013); ÁLVAREZ, BÉRTOLA and PORCILE (2007); and WILLEBALD (2007) characterize the settler economies.

the abundant factor and will reduce the income of agents that have the scarce factor. In a situation where labour works the land and commodity prices are dictated by world markets, movements towards globalization –through trade and commodity price convergence– favour workers' income as opposed to that of landowners in places where labour is abundant and land is scarce. On the other hand, in places where labour is scarce and land is abundant the relative income of landowners is favoured. Considering that labour remuneration in labour-abundant and land-scarce economies was initially lower, globalization in a pre-industrial environment led to a levelling of world income (O'Rourke & Williamson, 1999).

In the Atlantic economy, real wages and living standards converged from the mid-19th century until the First World War. This trend was driven by a narrowing of the wage gap between the New World and the Old. Migration and capital flows were important in this process because, through changes in aggregate labour supply, they affected long-run equilibrium output and wages. Wages increased in countries with high emigration and decreased in destination countries. Capital flows acted as an anti-convergence force (in the sense of the Lucas Paradox) because in pursuit of abundant natural resources and young and migrant populations they moved towards rich countries rather than poor ones (Clemens & Williamson, 2004).

Research into inequality trends in countries that participated in the global economy has considered two kinds of empirical evidence. First, it has considered trends in the ratio between farm rents per unit of acre and the unskilled wage rate *(r/w)*, which can be understood as a measure of how many days an employee has to work to pay the rent for one unit of land. This is an adequate index of inequality in a world with a big agricultural sector, where land is a critical component of total wealth and a decisive factor in income generation, and where the landowning class is a minority. Second, other research has attempted to trace inequality by observing trends in the ratio between GDP per worker and the unskilled wage rate *(y/w)*, which yields an index of how far the recipient of an average income is from the typical unskilled worker near the bottom of the distribution.

In order to make historical and long-run comparisons it is important to take into account two shortcomings of this approach, which is based on income and factor prices. First, there are serious empirical obstacles to obtaining consistent data, even for a single country, as data have often been compiled from a variety of sources, and combinations of different methodologies have been used. These problems affect the variables that are usually considered in the literature such as real wages (unskilled urban workers), rural land prices, trade (volume and prices), migration (by origin and destination), and capital movements (financial and direct investment). However, with the focus on rental/wage or income/wage

ratios, changes in the structure of the active population are not considered, so the ratios can be interpreted as indicators of income polarization rather than overall inequality.

The second problem is that, from a conceptual point of view, while the Hecksher-Olhin-Samuelson (H-O-S) approach is a useful framework to interpret several features of the process, other aspects seem to be hidden behind prices and their comparative evolutions. Productivity gains, the possibility to advance into unoccupied regions and to change the specialization of inhabited areas, and changes in economic structure, all have consequences that are hard to incorporate into the neoclassical approach.

Recent studies have addressed these limitations in two ways. Firstly, they have tried to improve the quality and quantity of data by elaborating new series. This approach is proposed in Arroyo Abad (2013) for Argentina, Mexico, Venezuela and Uruguay in the 19th century; Bértola (2000) and Bértola, *et al.* (1999) for Argentina, Brazil and Uruguay; Bohlin and Larsson (2007) for Sweden, and Greasley and Oxley (2005) for New Zealand. Recent studies have also considered evidence that allows for regional diversity, as in Emery, *et al.* (2007) for Canada, and Shanahan and Wilson (2007) for Australia. Secondly, new studies have estimated inequality and poverty in the long run using various indices (Prados de la Escosura, 2005a, 2007, for Latin America), or in a direct way using population and economic census data and assigning income to active individuals depending on their economic activity, profession, sex and region. This is the approach in Álvarez and Nicolini (2010), for Tucumán, Argentina; Bértola, Castelnovo and Willebald (2009), for Brazil; Bértola and Rodríguez Weber (2009), and Rodríguez Weber (2009), for Chile; and Bértola, *et al.* (2009, 2010), for the countries of the South American Southern Cone.

Some authors have addressed this conceptual shortcoming by emphasizing the relationship between growth and inequality in pre-industrial economies. Their basic idea is that potential inequality depends on the level of per capita income, the subsistence level, and the size of the elite that may appropriate the eventual surplus (Milanovic, Lindert & Willianson, 2007). Other authors have taken as a central concept the evolution of productivity, a process that depends on the interaction between technical progress, structural change and demand patterns (Porcile & Bértola, 2007; Willebald, 2006, 2007).

Finally, Harley (2007) argues that when applying the H-O-S model, the result is an approach that considers price convergence as pivotal in defining, identifying, and measuring globalization. However, this approach obscures the consequences of frontier incorporation and other insights that emerge when the First Globalization is seen as a mechanism whereby economies on the world periphery were incorporated into the core of organized economic activity. Exploiting the frontier involves discovering export staples, learning how

best to exploit them, and mobilizing capital and labour for production, use and distribution. Therefore a frontier-centred perspective makes it necessary to consider economic Institutions as a crucial element in economic development. García-Jimeno and Robinson (2011) show similar interest in the frontier. They analyze the classical Turner view or «Frontier Thesis» for North, Central and South America from the mid-19th century to 2007. They suggest that the success or failure of these economies in the long run can be explained by the quality of their political institutions taken together with the open frontier.

The main comparative advantage that enabled the settler economies to participate in world commodity markets, and the basis for their export-led growth strategy, was that land was available. However, at the same time, the First Globalization encouraged increasing inequality. This pressure was expressed as a widening gap between land rents and income from other sources (wages and profits). This process combined rising rental rates *(r)* with the expansion of the productive factor most intensively used in producing food and raw materials (land reacted endogenously to improvements in the terms of trade).

The countries in the club had different natural endowments, and this made for differing results. Income distribution worsened in the Australasian economies and Canada, but it worsened even more in the South American Southern Cone countries. However, with the information currently available it has not been possible to characterize the different patterns within the club properly because the predominant analysis has focused exclusively on index numbers.

We can ask: what happened to the income levels of the owners of the different productive factors? Is it enough to consider income rates *(r, w, y)* as in the standard literature (Williamson, 1995, was a forefather of a fruitful research line in this field), or should we also consider the evolution of the total of incomes, made up of wage rates and total hours worked, rent rates and total land used, and profits? In a period characterized by huge changes in the volume of productive factors (land, labour and capital), the evolution of mass incomes offers a new approach to inequality within the club. My aim is to identify different income generation processes and distributive patterns in settler economies based on new data and better estimations, in order to contrast and discuss some conclusions of previous analyses.

I use a sector approach and focus on the evolution of agriculture. This sector was the most important productive activity in settler economies and one of the leaders in land frontier expansion. I concentrate on the evolution of income per worker and functional income distribution because both dimensions reflect key features of the economic development of any society.

In Section 2, I present my data and estimates, and in Appendix 1 I give a more detailed description of my sources, assumptions and decisions. In Section 3 I discuss the evolution of agricultural income and its effects on the convergence of economies, based on new data (Appendix 2). In Section 4, I discuss the generation of income and then consider the dynamics of inequality, focusing on the evolution of functional income distribution, i.e. income structure in terms of wages, land rents and profits. In former British colonies entrepreneur-labourer relations predominated, but in countries that had been Spanish colonies economic relations were based on agricultural rental incomes. I suggest some preliminary explanations of this income distribution process. In Section 5, I draw conclusions and propose a research agenda.

2. DATA AND ESTIMATES

Research into inequality trends in countries that participated in the global economy in the second half of the 19th century and up to WWI looks at two kinds of empirical evidence. First, it considers the relative evolution of factor prices (typically r/w and y/w). Second, there have been efforts to directly estimate inequality from the economic conditions of the population in the long run, using various indexes.

In the present study I estimate a third alternative, namely functional income distribution. This is an intermediate line of enquiry that circumvents the limitations of the first approach insofar as I consider simultaneous movements in earning rates and the amounts of productive factors available. This perspective also contributes to the second approach by adding details to the characterization, in particular because I include factor ownership as a determinant element.

Functional income distribution shows how income is distributed among the different groups involved in production. It shows how the incomes earned by the owners of the various factors of production (labour, land and capital) are shared out as remuneration (wages), land rents and profits (dividends or interests). It is important not only to consider the evolution of different earning rates, which is what the recent literature has been concerned with, but also to take into account changes in the quantities of the factors applied to production. Given that agriculture was the main productive sector in settler economies and that together with its productive linkages it led the economic boom of the period, a study of the evolution of income distribution in this sector might yield some interesting insights.

The use of functional distribution to approach income inequality is not new. The early analysis of distribution in classical economics (Smith, Ricardo, Marx) focused on distri-

bution among the social classes identified with the productive factors: labour, capital and land. This methodology predominated until the 1960s, when more extensive social surveys made new and more precise proxies possible. However, interest in this subject has revived thanks to recent research into Latin America's economic history (Frankema, 2010; Neira, 2010).

I estimate functional income distribution in the agricultural sector during the First Globalization (from 1870 to the eve of WWI) in the six economies that make up the settler club. More specifically, I survey and estimate agricultural product, wages and total land incomes; and profits are obtained as a residual. As it is usual in the literature, I consider unskilled wages. The increase in the number of skilled workers might explain the evolution of income distribution, but not enough data is available to be able to determine labour skill wage differentials in all the countries of the club during the period.

Previous research into agricultural labour markets in settler economies during the First Globalization shows that, in terms of purchasing power, wages in New Zealand and the Australian states overtook those in Uruguay and the Argentine provinces. When we consider that agriculture in the former British colonies was more specialized, at least until the end of 19th century, the results are even more favourable for the Australasian economies and Canada. It follows that working with unskilled wages is a conservative scenario because the inclusion of a skill premium would probably make the differences even greater.

I select five benchmark years based on the long run evolution of settler economies and the availability of information. My sources and methodology to construct the series are given in Appendix 1. In the recent literature, attempts have been made to introduce these categories into historical analysis by Álvarez, *et al.* (2011) for New Zealand and Uruguay, and Álvarez and Willebald (2013) for the same two countries, Argentina and Australia. I improve the estimates with more and better sources and thus make my assumptions more precise, and I extend the analysis to include Canada and Chile in the sample. My results make it possible to estimate agricultural income per worker.

My time benchmark is an estimate of agricultural product per worker in local currency around the beginning of the First World War: Argentina, 1914; Australia, Canada and New Zealand, 1911; Chile, 1915; and Uruguay, 1912. I convert these values into current dollars and express them in 1913 dollars using the United States CPI to obtain purchasing power. Lastly, I extrapolate these annual values back in time using an index of agrarian constant prices product and an index of wage earners to obtain the evolution of income per worker (see Appendix 2). The literature on international comparisons of income levels concentrates on quantity effects by using a fixed PPP-converted benchmark for GDP

levels projected backwards using indexes of real product (Bairoch, 1976; Maddison, 1995). However, the relative positions depend on both prices and quantities, and the comparisons can change when these considerations are incorporated. Given that settler societies were open economies during the heyday of the gold standard, this concern may be especially important. Other converters such as exchange rates might provide better comparisons in terms of income and welfare. Prados de la Escosura (2000) discusses this point. He constructs a set of per capita GDP estimates at current prices, converted into common currency units and adjusted for differences in purchasing power, for more than 20 nations going back to 1820. My estimates follow this type of exercise but they focus on a single sector instead of the whole economy and involve a simpler adjustment.

3. AGRICULTURAL PRODUCTIVITY AND CONVERGENCE

As a group, the settler economies underwent two phases of economic growth that had different rates of expansion. When we use the evolution of income per capita as a measure, these economies grew by 1.6 per cent per annum between 1870 and the crisis of 1890 and then their rate of growth accelerated from the mid-1890s until WWI (2.2 per cent in 1894-1912), when they suffered a sudden drop[2].

What happened to agricultural activity during these two periods? The data show there was a moderate slowdown in the rate of growth in the second phase from 1.8 to 1.4 per cent. However, this overview does not adequately capture the ways in which the different members of the club performed. Among the large economies only Canada had a higher growth rate in the second period (3.3 per cent). The rates in Argentina and Australia decreased from 2.4 to 1.4 and from 2.3 to 0.9 per cent, respectively. Among the small economies only New Zealand became more dynamic in the second expansion cycle with an increase from 0.8 to 1.3 per cent. Uruguayan growth slowed down slightly from 1.5 to 1.4 per cent. Chile did not follow the trend and had negative rates in the second period (1.6 in the first period and -0.6 per cent in the second one).

These differences in growth rates had different consequences in terms of convergence (see the estimates of income per agricultural worker in Figure 1). Australasia was the settler region with the highest income per worker in agriculture. If we consider Australia as the leader of the group, that is to say the «richest» on average over almost 50 years, we find that the countries differ considerably in their relative performance (Table 1). I compare agricultural income per worker and total per capita income in each economy with the

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2. The simple average of Argentina, Australia, Canada, Chile, New Zealand and Uruguay.

leader –Australia– as a measure of how far each country was catching up (when the indicator increased) or falling behind (when the indicator decreased)[3].

In the light of these averages we can differentiate three situations: Argentina and New Zealand had a ratio very close to Australia's (0.97), Canada and Uruguay were further behind (0.71 and 0.69), and Chile was the «failure» of the club in terms of agricultural production (0.43). However, those similar averages hide different evolutions.

TABLE 1

Convergence indicators

Agricultural income compared to Australia

	Argentina	Australia	Canada	Chile	New Zealand	Uruguay
1865-1869	0,87	1,00	0,69	0,54	1,18	0,81
1870-1874	0,91	1,00	0,65	0,51	1,14	0,67
1875-1879	0,96	1,00	0,68	0,51	1,04	0,62
1880-1884	0,98	1,00	0,69	0,53	0,91	0,60
1885-1889	0,94	1,00	0,63	0,48	0,88	0,61
1890-1894	0,93	1,00	0,59	0,43	0,87	0,66
1895-1899	1,00	1,00	0,66	0,39	0,91	0,72
1900-1904	1,03	1,00	0,73	0,34	0,93	0,75
1905-1909	1,03	1,00	0,81	0,29	0,90	0,74
1910-1913	1,05	1,00	0,92	0,31	0,93	0,73
Average	**0,97**	**1,00**	**0,71**	**0,43**	**0,97**	**0,69**

GDP per capita compared to Australia

	Argentina	Australia	Canada	Chile	New Zealand	Uruguay
1865-1869	0,35	1,00	0,54	0,40	0,94	0,58
1870-1874	0,38	1,00	0,50	0,38	0,98	0,67
1875-1879	0,34	1,00	0,41	0,34	0,93	0,50
1880-1884	0,35	1,00	0,48	0,43	0,85	0,50
1885-1889	0,47	1,00	0,48	0,41	0,80	0,56
1890-1894	0,56	1,00	0,58	0,50	0,91	0,58
1895-1899	0,73	1,00	0,69	0,60	1,07	0,67
1900-1904	0,72	1,00	0,80	0,56	1,11	0,61
1905-1909	0,77	1,00	0,81	0,55	1,08	0,59
1910-1913	0,74	1,00	0,83	0,58	1,03	0,63
Average	**0,54**	**1,00**	**0,61**	**0,47**	**0,97**	**0,59**

Source: Appendix 2. Own elaboration.

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3. BÉRTOLA and PORCILE (2000) propose similar indicators.

FIGURE 1
Agricultural product per worker. 1913 constant dollars (1865–1913)

Figure 1.a
Argentina

Figure 1.b
Australia

Figure 1.c
Canada

Figure 1.d
Chile

Figure 1.e
New Zealand

Figure 1.f
Uruguay
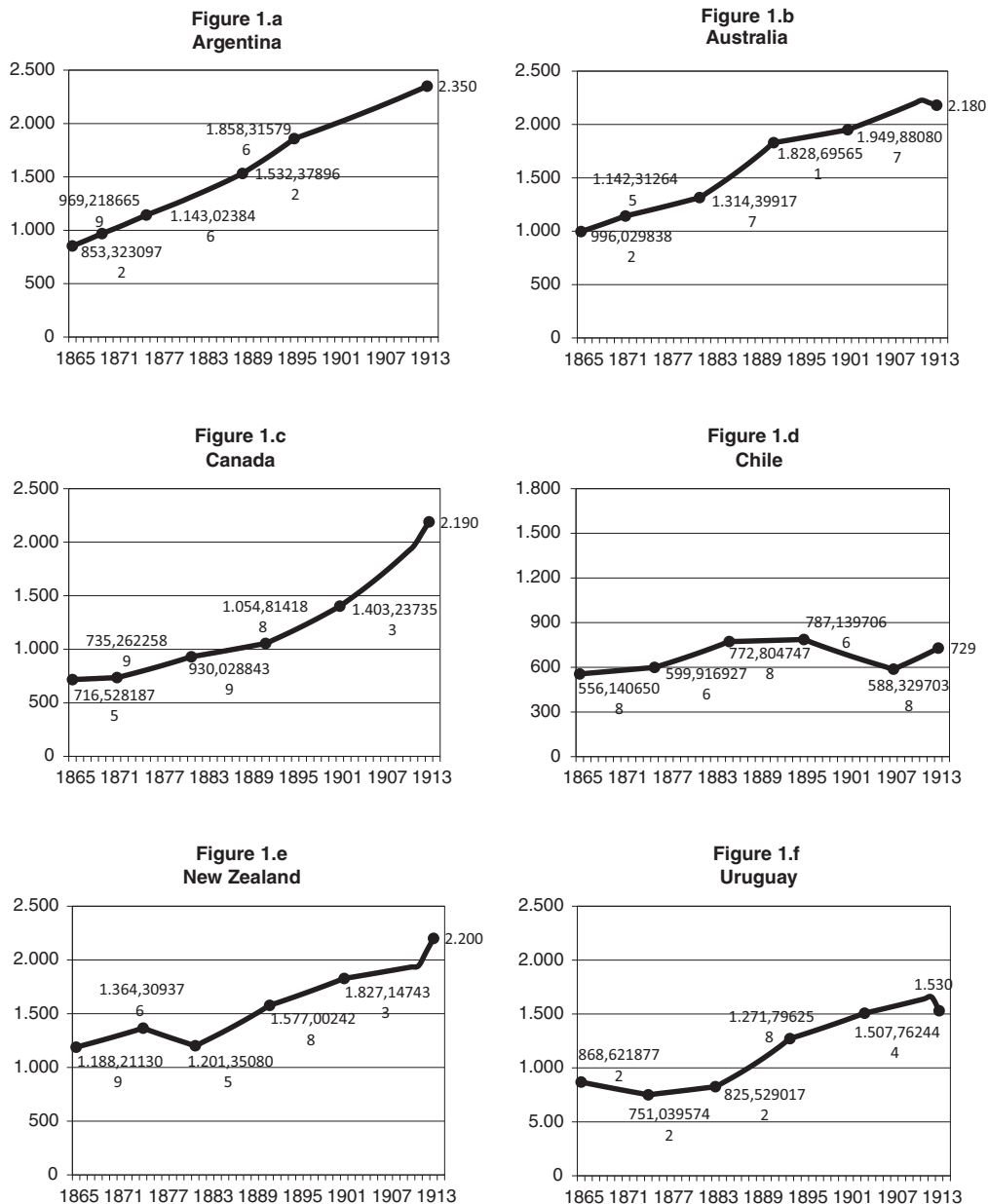
Source: Appendix 2. Own elaboration.

New Zealand started the period with higher agricultural income than the leader (1.18 in 1865-1869), then fell behind in the 1880s and there was a stable gap of 10 per cent thereafter. In contrast, Argentina was considerably behind the leader at the beginning of the period with a gap of 0.13, but overtook Australia in the first decade of the 20th century. As regards Uruguay, at the beginning of the period it had higher levels of agricultural income per worker than Canada and the two countries developed similarly until the last decade of the 19th century. Then, from the 1890s onwards, Canada progressed strongly and attained income levels close to Australia's at 0.92.

I compare my results to those derived from the usual analysis of catching-up that considers income per capita as the measure of relative performance. I use data from Maddison (2001) and replicate the calculation above, which considers Australia as the leader (Table 1, lower panel).

The dynamics of the process and the levels that result are different, and I propose a shift-share analysis to combine the two outcomes. The traditional shift-share decomposition (Fabricant, 1942) has been extensively used in economic history in discussions of productivity growth, technological change and development patterns (Chenery, Robinson & Syrquin, 1986; Crafts, 1993; Field, 2006; Prados de la Escosura, 2005b). The traditional shift-share analysis is given by:

$$P^T - P^0 = \sum_{i=1}^{n}\left(P_i^T - P_i^0\right)\cdot \overline{S}_i + \sum_{i=1}^{n}\left(S_i^T - S_i^0\right)\cdot \overline{P}_i \qquad (1)$$

In which T indicates the end of the period and 0 the beginning, and where:

P: labour productivity.

P_i: labour productivity in the *i-th* sector, with *i=1…n*.

S_i: sector employment share in the *i-th* sector, with *i=1…n*.

$\overline{P}_i, \overline{S}_i$: labour productivity and sector employment in the *i-th* sector (average).

Aggregate productivity growth may be disaggregated into two effects. The first term on the right-hand side is the «within-sector productivity growth effect» and the second term is the effect of changes on the allocation of labour (the «between-effect» or «shift-effect»). Expansion in total labour productivity is the result of increasing sector productivities and/or the reallocation of labour from low to high productivity sectors (structural change). I apply this concept to my examination of sector convergence (Wong, 2006).

I compare total productivity (income per capita) in each settler economy *(P)* with that of the leader –Australia– *(P^A)* as a measure of convergence *(P^A-P^i)*, and I explain this difference according to a particular type of «within-effect» (related to differences in sector productivities) and to shifts in productive structure. I identify agriculture *(AG)* and the rest of the sectors *(RS)*, and I weight the former component in accordance with the compared share of the two activities in total GDP, and the latter with relative average total productivity. I use Uruguay *(Uy)* as an example to illustrate this concept.

$$P^A - P^{Uy} = (P^A_{AG} - P^{Uy}_{AG}).\frac{\overline{S}^A_{AG}}{\overline{S}^{Uy}_{AG}} + (P^A_{RS} - P^{Uy}_{RS}).\frac{\overline{S}^A_{RS}}{\overline{S}^{Uy}_{RS}} + (S^A_{AG} - S^{Uy}_{AG}).\frac{\overline{P}^A_{AG}}{\overline{P}^{Uy}_{AG}} + (S^A_{RS} - S^{Uy}_{RS}).\frac{\overline{P}^A_{RS}}{\overline{P}^{Uy}_{RS}} \qquad (2)$$

$$(P^A - P^{Uy}) - (P^A_{AG} - P^{Uy}_{AG}).\frac{\overline{S}^A_{AG}}{\overline{S}^{Uy}_{AG}} = (P^A_{RS} - P^{Uy}_{RS}).\frac{\overline{S}^A_{RS}}{\overline{S}^{Uy}_{RS}} + (S^A_{AG} - S^{Uy}_{AG}).\frac{\overline{P}^A_{AG}}{\overline{P}^{Uy}_{AG}} + (S^A_{RS} - S^{Uy}_{RS}).\frac{\overline{P}^A_{RS}}{\overline{P}^{Uy}_{RS}} \qquad (3)$$

I then compare my previous convergence indicators and consider the difference between the convergence ratio for the whole economy (income per capita) and the sector convergence ratio with agrarian income per worker suitably weighted. A positive result means that convergence within the club responds to favourable performances by non-agriculture sectors. This happens because (i) labour productivity in manufacturing and services is higher than agriculture productivity, and (ii) the follower economy «moves» its productive structure towards sectors with higher productivity (Figure 2).

Until the 1880s, the economies in question had results that were mostly negative or slightly positive. This shows that agriculture sector convergence was a stronger process than overall convergence, which reflects the agricultural character of these economies. However, as these economies grew, structural change advanced and they developed progressively more sophisticated productive structures. Agriculture convergence became less intensive and global convergence emerged as a more important force. In four of the economies in question there was a rising trend on this indicator, which is in line with the expected outcome, but only three of them –New Zealand, Canada, and Chile– attained positive values. In these economies the combination of manufacturing and mining provided alternative engines for economic growth. Of course, Australia, by definition, has non-negative values and has similar characteristics. This combination meant that the shares of artisan production and manufacturing expanded in New Zealand and Canada, and Chile's mining specialization became more intensive. However, Argentina never attained positive values and Uruguay's indicator remained stable at around zero, which indicates an absence of structural change and low dynamism in non-agricultural activities.

FIGURE 2
Convergence and shift share analysis
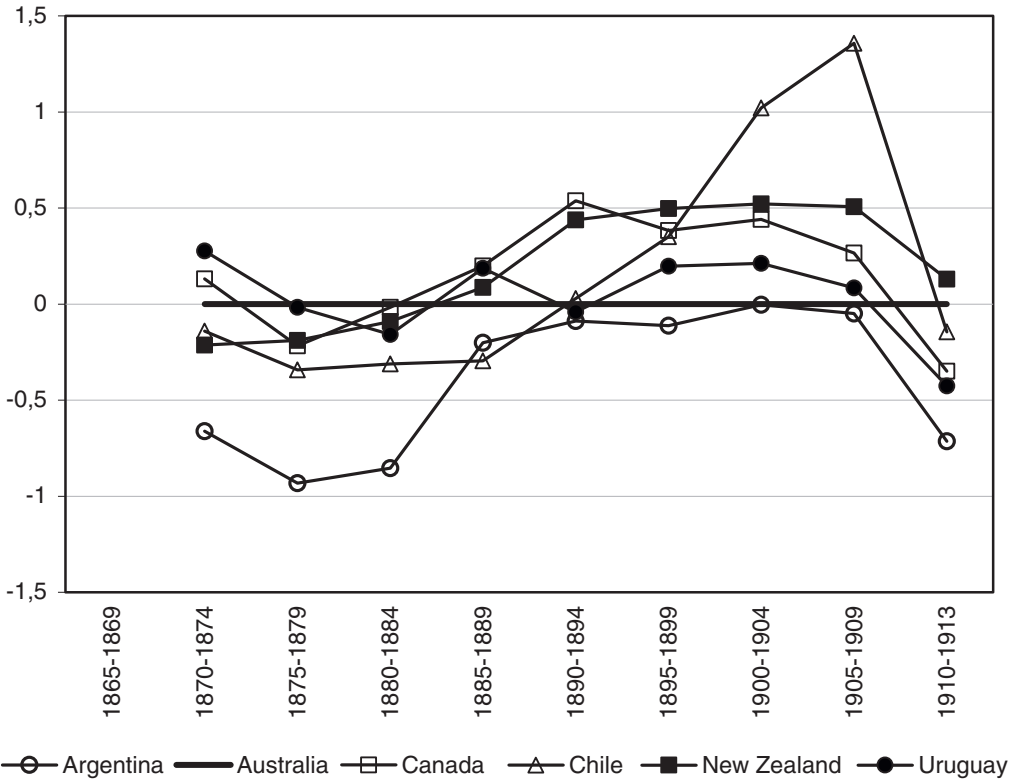
Source: Appendix 2. Own elaboration.

4. AGRICULTURAL FUNCTIONAL DISTRIBUTION

4.1. Estimates

I now estimate agrarian functional income distribution in the benchmark years and determine the shares of wages, land rents and profits in sector income (value-added). I have been able to identify two «patterns» (averages in Table 2).

The South American Southern Cone consists of Argentina and Uruguay in the River Plate region, plus Chile. In these countries income composition is dominated by land rents, which account for more than half of total agrarian income. In Canada and New Zealand land rents have a smaller share with ratios of 47 and 43 per cent, respectively,

and Australia has an average of 50 per cent. This stands in contrast to the situation in the Southern Cone, but the different countries have different modalities.

TABLE 2

Functional income distribution. Shares in total agricultural GDP

ARGENTINA	Wage	Rent	Profit	AUSTRALIA	Wage	Rent	Profit
1869	34%	54%	12%	1871	31%	51%	18%
1875	27%	59%	14%	1881	28%	46%	26%
1888	32%	48%	21%	1891	26%	60%	14%
1895	24%	41%	35%	1901	34%	53%	13%
1914	21%	67%	12%	1911	25%	39%	36%
Average	28%	54%	19%	Average	29%	50%	21%

CANADA	Wage	Rent	Profit	CHILE	Wage	Rent	Profit
1871	22%	48%	30%	1875	18%	61%	21%
1881	23%	44%	33%	1885	14%	57%	29%
1891	27%	55%	19%	1895	17%	62%	20%
1901	20%	37%	43%	1907	21%	49%	30%
1911	21%	50%	29%	1915	15%	57%	28%
Average	23%	47%	31%	Average	17%	57%	26%

NEW ZEALAND	Wage	Rent	Profit	URUGUAY	Wage	Rent	Profit
1874	27%	33%	39%	1874	36%	46%	18%
1881	35%	42%	22%	1883	28%	49%	23%
1891	30%	41%	29%	1893	24%	49%	26%
1901	26%	48%	26%	1903	27%	48%	25%
1911	30%	51%	20%	1912	20%	68%	13%
Average	30%	43%	27%	Average	27%	52%	21%

Source: Appendix 1. Own elaboration.

In Australasia total wages had a higher share, with ratios of almost 30 per cent. «Australian settlers ranged in a gamut extending from the humble poor to the propertied middle class […] More of the upper class was omitted from the fragment of British society which was Australia. The working classes predominated in its founding, and their attitudes were of a special character.» (Rosecrance, 1964: 282). In Australia, the distinction between labour and capital was much more pronounced than in North America and even farm-

ing was more capitalist. The average Australian was not his own economic boss but a wage earner, like the original immigrant from Britain (Burt, 1965: 75).

FIGURE 3
Income shares. Ratios of Land Rents/Profits, Wages/Land Rents, and Wages/Profits (1870s-WWI)

Figure 3.a
Land Rents/Profits (1870 -1913)

Figure 3.b
Wages/Land Rents (1870 -1913)

Figure 3.c
Wages/Profits (1870 -1913)
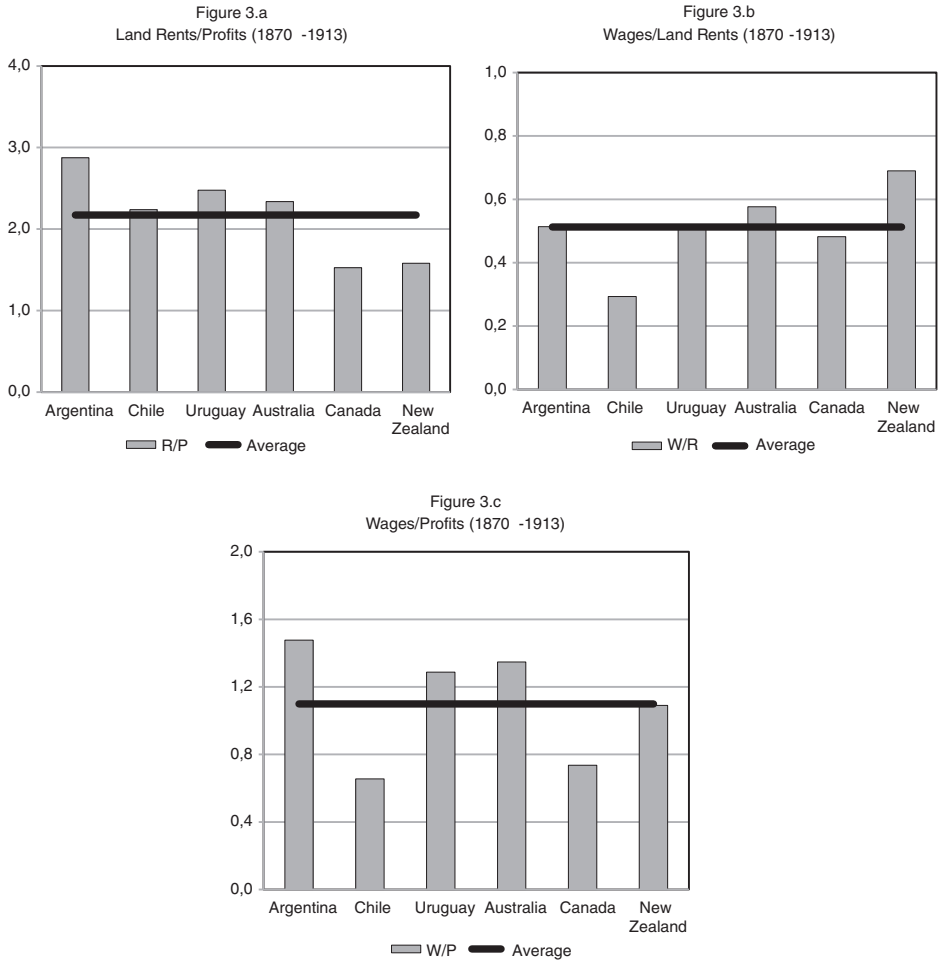
Source: Appendix 1. Own elaboration.

In Canada, on the other hand, profits had a greater share of income distribution with more than 30 per cent. This can probably be explained by the fact that there were many family farms and small producers, so property capital was a significant income source (Adelman, 1994). New Zealand was very like Australia except that it had more intensive and more effective land policies from 1890 onwards (Álvarez & Willebald, 2013) and

its pattern of high wages and profits made its income structure comparable to that of Canada.

To explain these figures, I present indicators that relate the average income shares in the periods (rents/profits, R/P; wage/rents, W/R; and wage/profits, W/P) compared to the club mean (Figure 3).

R/P ratios are significantly higher in the River Plate, Chile and Australia than in New Zealand and Canada (Figure 3.a). Argentina (2.8), Chile (2.2), Uruguay (2.4) and Australia (2.3) have ratios in which the land rent share was more than twice the profit share. Note that the ratios for New Zealand and Canada have a narrower gap (1.5). When W/R ratios are considered, the countries in the club have similar profiles in which land rental predominates over wages (with ratios less than 1), although this pattern features more prominently in the Southern Cone. To some extent Canada has the same characteristic, but Australia and New Zealand are the opposite and have relatively higher wages (Figure 3.b). New Zealand has relatively lower land rents, which is a common result in comparisons with profits and wages. Australia and Canada present similar results considering, respectively, wages and profits (Figure 3.c).

It is interesting to distinguish between two distributive patterns. On the one hand, economic relationships based on agricultural rental incomes predominated in the former Spanish colonies. On the other hand, entrepreneur-labourer relationships were predominant in the former British colonies, which encouraged the dynamics of larger markets. Note that the focus on averages conceals time differences. For this reason I interpolated and projected the benchmarks in order to simulate time trajectories and evaluate the different dynamics (Figure 4).

I consider the shares of wages and rents in total agricultural income and compare both evolutions to the club average. The time patters in Argentina (Figure 4.a) and Australia (Figure 4.a) are clearly different, especially from the 1890s onwards. While Argentina expanded the gap between land rents and wages with figures, respectively, higher and lower than the settler average, Australia reduced the participations of both incomes with figures, respectively, lower and higher than the average. In other words, income distribution in Australia improved and the share of profits in agriculture increased, probably as a consequence of greater capitalization, but in Argentina an income structure based on rents and a low share for wages was consolidated. Uruguay's evolution (Figure 4.f) was very similar to the Argentine pattern and had similarities with Chile, even though these countries' trajectories started from different levels. In Canada and New Zealand rents increased, as we would expect, but neither country exceeded the settler average and the shares of wages were

FIGURE 4

Wages and rents in total agriculture income. Current prices.

In percentages (1870-1913)

Figure 4.a Argentina

Figure 4.b Australia

Figure 4.c Canada

Figure 4.d Chile

Figure 4.e New Zealand

Figure 4.f Uruguay
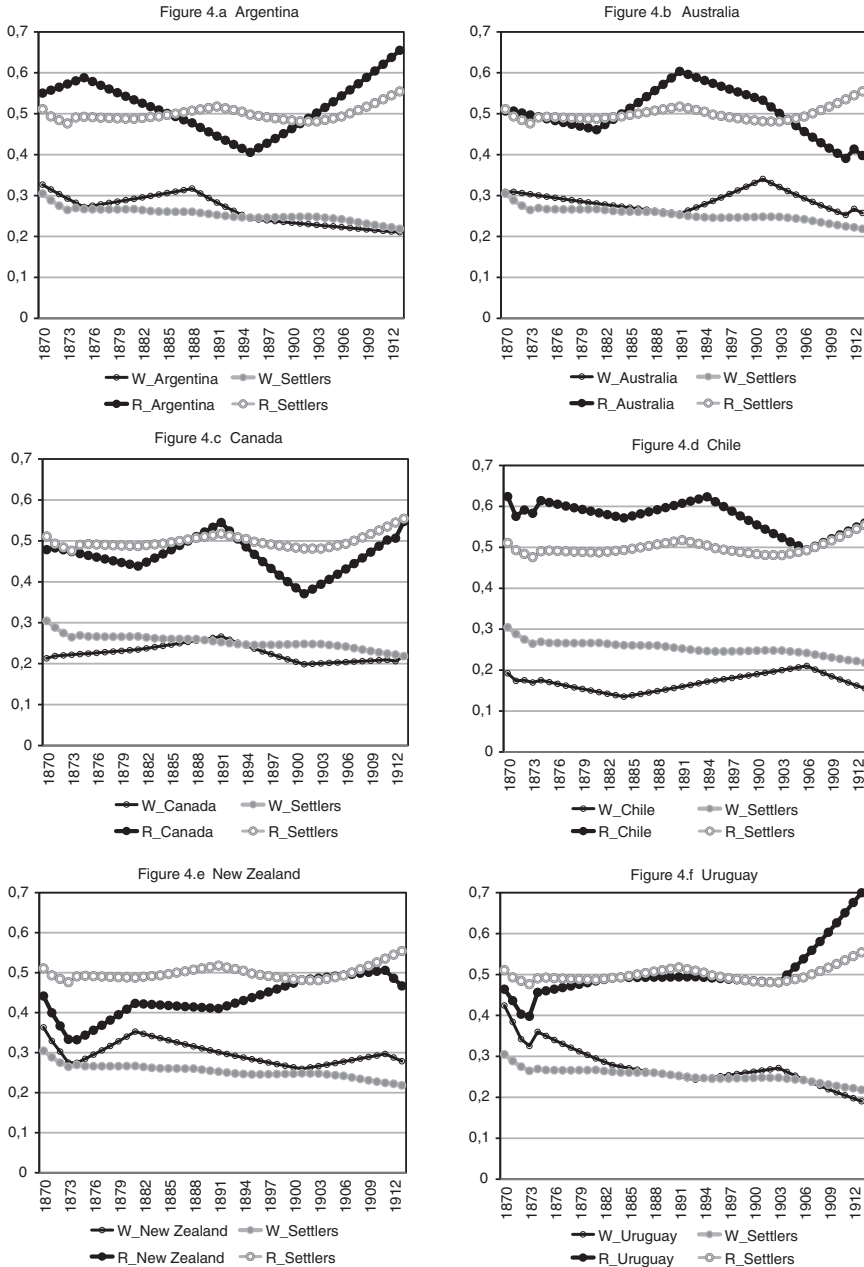
Source: Appendix 1. Own elaboration.

relatively stable. In New Zealand, like in Australia, wages had a greater share than the average, and Canada had slightly lower levels, which is typical of an agriculture profile based on small farms and many landowners.

4.2. «Rental drifts» and the timing of the land frontier

Instead of comparing wages and land rental rates as is proposed in recent studies (Williamson, 2000, 2002, as precursors of an extensive literature), I examine how total wages, rents and profits evolved. This approach differs from the traditional analysis because in my study the ratios include the double effect of changes in earning rates (wages, rents, profits) and in the number of earners (workers, hectares and capital). I am assuming that the different groups are homogenous and that dispersion within the group is low. This simplification may lead to errors when the economies become more «sophisticated» and the owners of productive factors combine the roles of worker, capitalist and landowner. However, the club retained features of «traditional» economies –especially in South America– so this assumption should not bias the results.

Considering that landowners are a minimal proportion of the population and that these economies expanded during the period, the increasing share of land rents against wages and profits reflects increasing inequality. However, the relation between profits and wages is not so evident. Estimates of the number of «capitalists» are even more imprecise than estimates of total workers, and the structure of farm ownership means that these productive roles may overlap. To centre the discussion on income distribution, I do not consider W/P ratios as a reference but rather land rents compared with wages (R/W) and profits (R/P) because I want to capture the «rentier» character of the agricultural sector.

Today there is renewed discussion about rents and different forms of wealth (Piketty, 2014), but already in the early 19th century land rents was a central subject in the economic literature. Ricardo's view that landowners' interests were contrary to industrial expansion (Ricardo, 1821, especially Chapter 2) was followed by criticism of the rentiers as a constraint in the dynamics of capital accumulation and production during the industrializing process in the second half of the 19th century. Individuals who received income from neither labour nor capital were seen as parasites living off the efforts of the labourer and the entrepreneur-capitalist. Some countries have been described as «rentier economies» (Schlumberger, 2008). Using the adjective «rent» to describe a type of economic order implies that such economies are characterized by situations in which rents are predominant, and in consequence rent-seeking is a socially dominant phenomenon. However, if rent-seeking describes some individuals' rational behaviour, this presupposes

the existence of large amounts of rent within such an economy. «The genuinely capitalist wage-labour relation is broken up and thus the strife for investment in order to realize profits is not a dominant determinant of economic behaviour» (Schlumberger, 2005: 72). In other words, the «distinguishing feature of the rentier thus resides in the lack or absence of a productive outlook in his behaviour […] Dynamic, innovative, risk-bearing, Schumpeter's entrepreneur is the antithesis of the rentier» (quoted in Schlumberger, 2005: 72). In this article my aim is not to analyse the consequences of this characteristic but only to asses the magnitude of the process.

R/W and R/P are considered in terms of levels and evolution (rising trajectories represent a higher share of rental incomes in agricultural society), and although all settler economies underwent «rental drifts»[4], the timing and intensity of the processes were different in each case. On the one hand, until the 1890s, total land rents in the club amounted to twice total wages. However, the commodity price boom (Williamson, 2002, 2007) and land frontier expansion (Willeblad, 2011) in the First Globalization from the 1890s to WWI caused this ratio to increase to 2.7[5]. The impact was not immediate; it only came after a period when the indicator decreased (Figure 5). This result is consistent with theoretical frameworks (Findlay, 1995; Findlay & Lundahl, 2001) that consider that incorporating «new» land requires time for the application of resources to clear land, and this may delay the return on the investment (which, depending on the type of factor, may be in the form of rents or profits). At the same time, wages on the frontier may be higher for workers –wage premiums– and they may even be able to press for higher pay in other regions (Harley, 2007). In Canada (Figure 5.c) the levels of the ratio and the trend were close to the average levels in the settler club (steady at around 2.1). In Australasia (Figures 5.b, 5.e), levels were generally lower than the average, although the evolutions followed different trajectories. In Australia the worsening impact on income distribution occurred in the 1890s, before the other settler countries. This was probably linked to that country having an earlier process of land frontier expansion (Willebald, 2011). Afterwards, the ratio returned to the previous level. In New Zealand, worsening income distribution was persistent, but it started from very low levels and on the eve of WWI it had not reached the ratios of the River Plate countries. This process of increasing inequality moderating at the beginning of the 20th century is consistent with the intensification and subdivision of estates in that period (Álvarez & Willebald, 2013).
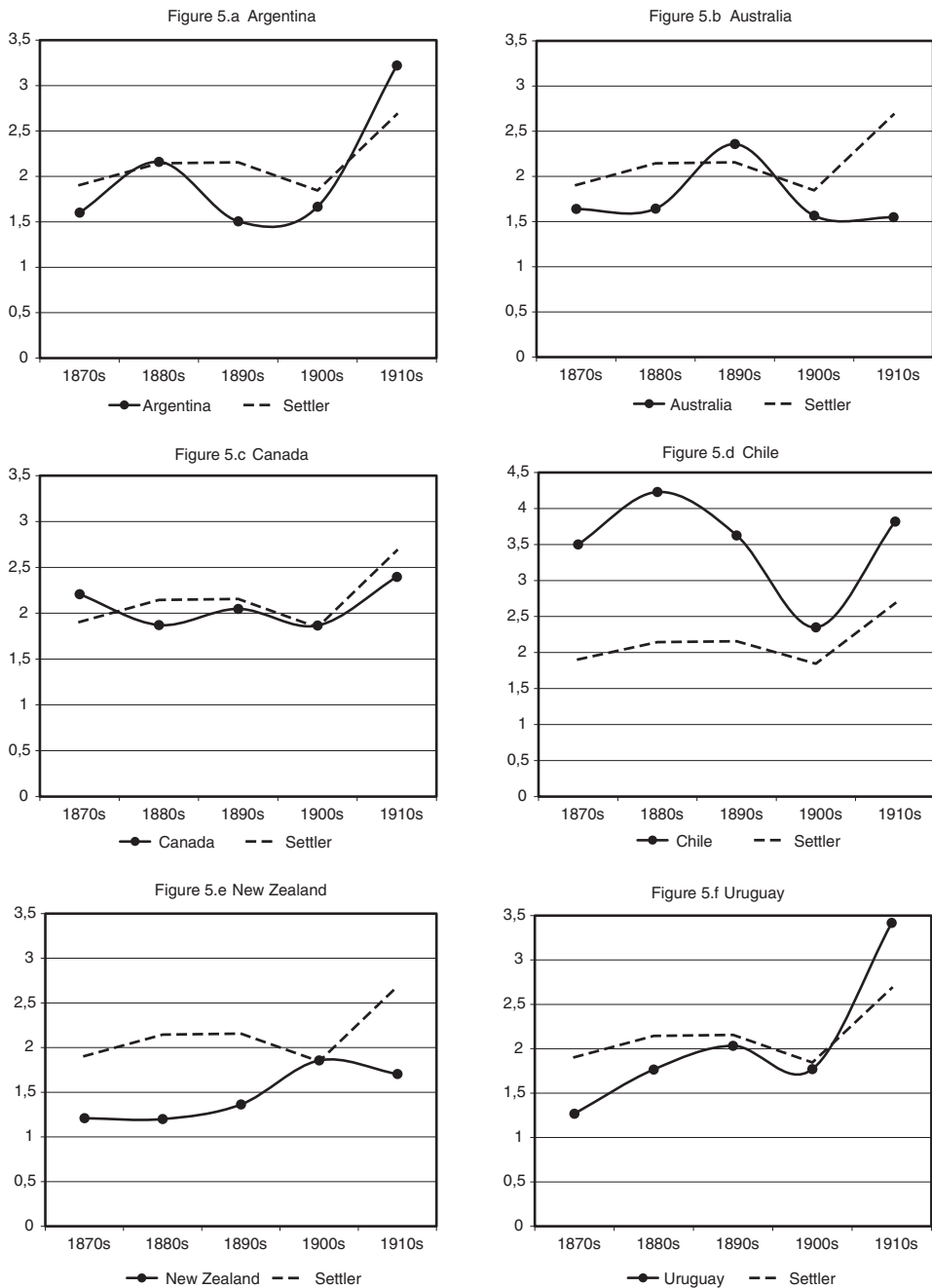
In Argentina, the impact of the price boom on inequality raised the indicator to 3.2 (Figure 5.a) and in Uruguay to 3.4 (Figure 5.f). Income distribution in Chile improved

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4. My thanks to Prof. Luis Bértola for suggesting this denomination.
5. 1870s: 1.90. 1880s: 2.14. 1890s: 2.16.

FIGURE 5
Land rents/wages ratios. Current prices (1870-1913)

Figure 5.a Argentina

Figure 5.b Australia

Figure 5.c Canada

Figure 5.d Chile

Figure 5.e New Zealand

Figure 5.f Uruguay

Source: Appendix 1. Own elaboration.

during the closing decades of the 19th century but this trend was reversed in the first decade of 20th. Chile began the 1900s with the highest levels, and the previous improvement was associated with changes outside agriculture. Frontier expansion in the 1880s and 1890s was led by mining, and the competitive effects on the labour market made for upward pressure in other sectors (Rodríguez Weber, 2009). These trajectories are consistent with theoretical frameworks that assume land frontier expansion as a costly process, with consequences that differ depending on land quality (Berger & Willebald, 2011).

Income distribution clearly worsened in Argentina, Uruguay and New Zealand, which all started at different levels. These are precisely the economies that extended their frontiers to the «best» land. In Chile the evolution of income distribution was not homogenous and the situation deteriorated badly at the end of the period, which is consistent with the irregular trajectory of the country's land frontier expansion particularly as regards the mining and agriculture sectors. Lastly, in Canada and Australia frontier expansion was relatively moderate and included a high proportion of medium and low quality land, and this seems coherent with a stable distribution (Willebald, 2011).
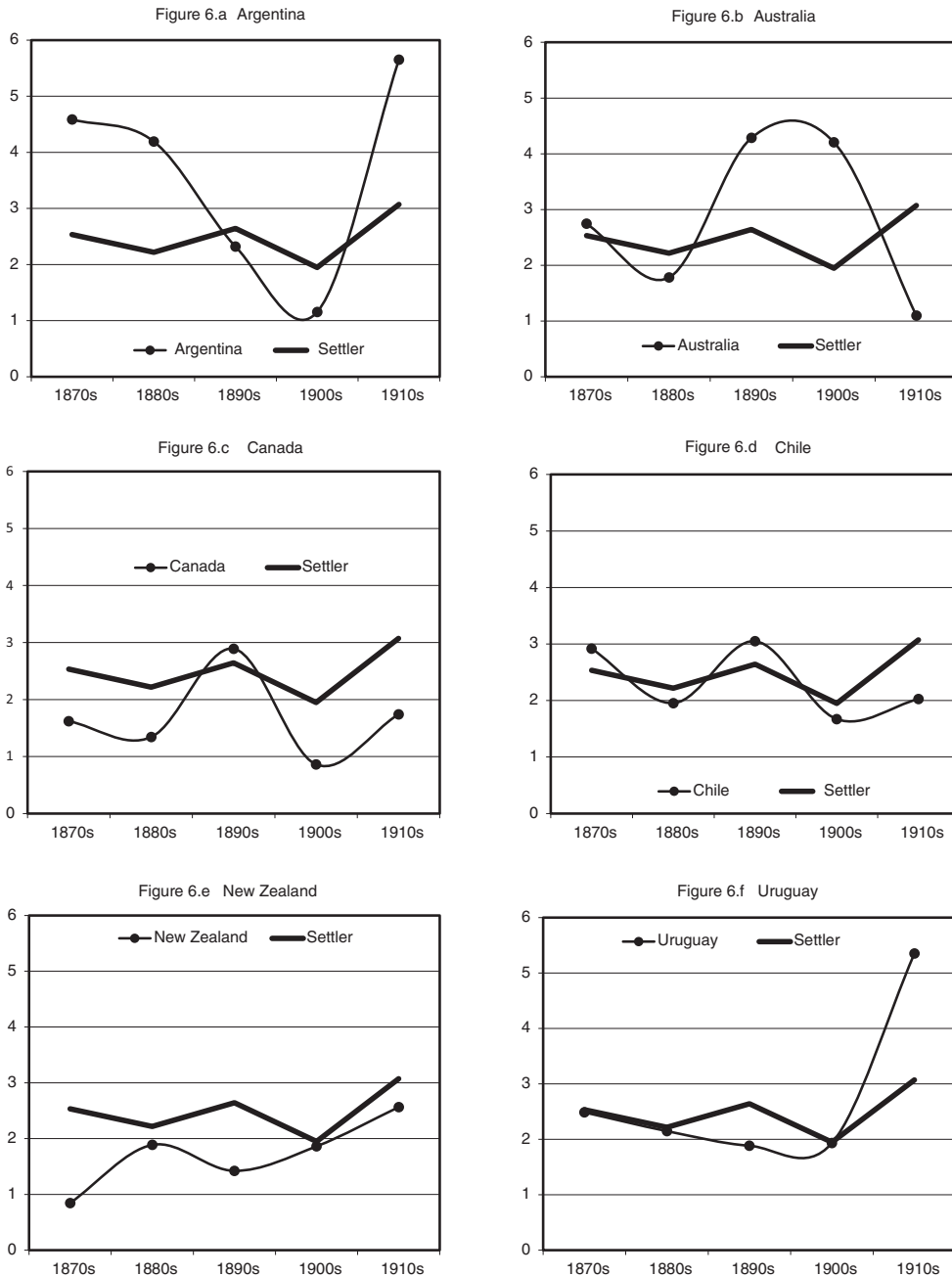
Until the 1880s, the difference between total rents and profits was greater than the difference between rents and wages by a factor of 2.4[6], and income distribution worsened to an equivalent extent: the ratio increased to 3.1.

The First Globalization had huge impacts in terms of land and capital accumulation and their returns, and it generally promoted worsening income distribution. However, the average is less representative for each individual case than in the previous comparisons, especially for Argentina (Figure 6.a), Australia (Figure 6.b) and Uruguay (Figure 6.f). In the River Plate, the pattern was similar. In a process that might be a result of the increasing capitalization of agricultural activity (wire fences, buildings, machinery), both indicators decreased until the end of the 19th century. The impact of the price boom and land frontier expansion made for a significant rise in the indicator until it reached levels where rents were around 5.5 times profits. However, in Australia the pattern of evolution was the reverse. In the 1890s the ratio of rents against profits had values between 4 and 5, but then decreased until the 1910s when the ratio was just over 1. The capitalization of Australian agriculture and the «desire to change the environment» (Williams, 1975: 87), which became very pronounced in the closing decades of the 19th century, were led by mechanization, the construction of irrigation systems and the progressively increasing use of fertilizers and special varieties of cereals that made for increasing profits.

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6. 1870s: 2.53; 1880s: 2.22.

FIGURE 6

Land rents/profits ratios. Current prices (1870-1913)

Figure 6.a Argentina

Figure 6.b Australia

Figure 6.c Canada

Figure 6.d Chile

Figure 6.e New Zealand

Figure 6.f Uruguay

Source: Appendix 1. Own elaboration.

The evolution in Canada (Figure 6.c) and New Zealand (Figure 6.e) was mostly below the settler average, which indicates an income structure where rents hardly exceeded profits. In other words, these two economies were less «rentier» and more «entrepreneur-labourer» than the others in the club. Finally, Chile (Figure 6.d) had a similar trajectory to the mean for the club, which confirms that the main component in inequality was the difference between landowners and workers. Capitalization in agriculture only became important in the 20th century, and its effect became very marked in the subsequent decades (Rodríguez Weber & Willebald, 2010).

It is important to consider that in the present methodological approach, total profits are estimated as a residual. Therefore it is a variable that reflects not only total profits but estimation errors as well. I believe that the directions of the trends are correct, but it is possible that changes may have exaggerated the processes. I will examine this point in greater depth in future research about settler economies and economic development. In particular, the debate regarding whether economic growth is profit-led or wage-led seems an attractive question to analyse with regard to the creation of «(post) staples economies» in the second half of the 20th century (Wellstead, 2007).

5. CONCLUSIONS

The above analysis makes three main contributions. In empirical terms, it presents original estimates of income per worker and functional income distribution in the agricultural sector of settler economies, and it also comparatively analyses the different patterns and trends which characterised those countries.

It makes two additional contributions to progress in analytical fields. First, the impact of globalization on natural resource abundant (land-abundant) economies in terms of inequality was that income distribution worsened. This finding is consistent with the more extended evidence. In particular, my estimates for the agricultural sector show that wages and profits tended to make a relatively smaller contribution to incomes while the share of land rents increased («rental drifts»). This evolution was clearer in the River Plate economies and Chile than in Australasia and Canada, where the evidence is mixed and the distribution among the owners of the factors of production varied.

Second, it is interesting to distinguish between two distributive patterns. In the former British colonies, entrepreneur-labourer relations (related to profits) and broader markets (related to wages) were relatively predominant, but in the former Spanish colonies economic relations were based on agricultural rental incomes. The paths of the members

of the club were not uniform. One of my next objectives is to determine how the dynamics of land frontier expansion was probably one of the main factors in these different influences (Willebald, 2011, for the initial steps).

In economies in which a large proportion of the total wealth is in the form of land, total savings can be used either to accumulate capital and attend to market demand or to invest in land (Kurz & Salvadori, 1995; Foley & Michl, 1999). When land is still relatively abundant, investment in this asset is aimed at reaping the benefits that will come from rising land prices. As land prices go up, capital owners spend a greater part of their wealth on land, and this slows down investment. When land is not abundant –when the frontier closed– rises in land rents depress profits and boost capital expenditure up to the point at which investment in physical capital virtually stops. In both cases, resources are diverted from their alternative destination (capital) in a sense close to the idea of the crowding out approach to the curse of natural resources (see Willebald, 2011, for a review of different approaches to the «curse hypothesis», and Gylfason, 2006, for the crowding out approach).

Capital accumulation is one of the main sources of economic growth and technical change. This means that economies in which land rents and/or opportunities for land especulation are greater will encounter obstacles to structural change, and this will affect economic development. The results of shift-share exercises to explain agricultural productivity are consistent with this approach. The rentier agricultural economies of the club –those in the South American Southern Cone– were in fact those that showed less signs of structural change[7]. These results are not incompatible with the stages of economic growth during the period of land frontier expansion. Difficulties arose when the impact of the incorporation of this «new» productive factor diminished and these economies faced the challenge of industrialization[8].

The availability of land resources was the main comparative advantage that enabled the settler economies to participate in world commodity markets and was the basis of their export-led growth strategy. But at the same time the First Globalization made for increasing income disparities. This pressure was expressed as a wider gap between land rents and wages (and profits), a process that combined rising rental rates and the expansion of the productive factor more intensively used to produce food and raw materials. However, the land in these countries' territories was not homogenous, and this made for differing results.

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7. In the case of Chile, my indicator reflects the transformation from an agricultural to a mining economy, and in consequence the productive structure continued to be based on primary resources.

8. Di Tella and Zymelman (1967) and Di Tella and Platt (1986) are forerunners in this area.

In this area Findlay (1995), and Findlay and Lundahl (2001), study the endogenous land frontier expansion and Berger and Willebald (2011) analyze the effects of introducing different land qualities. According to this theoretical framework, which is in the tradition of the «specific factor» model, moving the land frontier onto the «best» land would foster adverse effects on inequality because it would enable a reduced segment of the population (landowners) to capture increasing rents. The more intensive worsening of income distribution in the agricultural sector in the River Plate could be associated with the different timing of land frontier expansion onto territories that were better in terms of agricultural aptitude and distance to markets.

However, the effects of an abundance of natural resources are not determined by resource endowments alone; institutional factors should also be considered to make the explanation more complete. The conditions prevailing at the time contributed to the creation of a «rentist» pattern in the former Spanish colonies, where land ownership ensured the elite received income without having to make large investments. Land concentration was high because of the colonial heritage (Bértola *et al.*, 2010), and successive policies to stimulate the division of the big estates always failed. In other words, land frontier expansion occurred at the same time that the institutional arrangements that created a new land ownership rights system were set up (Álvarez & Willebald, 2013) and both processes contributed for consolidating the uneven distribution.

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APPENDIX

The additional material of this article can be consulted at the web address: http://historiaagraria.com/

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