

**Income distribution in the Latin American Southern Cone  
during the first globalization boom, ca: 1870-1920<sup>◊</sup>**

Luis Bértola, Universidad de la República – Uruguay (lbertola@fcs.edu.uy)  
Cecilia Castelnovo, Universidad de la República - Uruguay (ccastelnovo@fcs.edu.uy)  
Javier Rodríguez, Universidad de la República - Uruguay (jerweber@fcs.edu.uy)  
Henry Willebald, Universidad Carlos III - Madrid (hwilleba@clio.uc3m.es)

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<sup>◊</sup>Luis Bértola, Facultad de Ciencias Sociales, Constituyente 1502, 11200 Montevideo, Uruguay (lbertola@fcs.edu.uy). This paper was written as part of the project "A Global History of Inequality in the Long 20<sup>th</sup> Century", directed by Luis Bértola and financed by CSIC, Universidad de la República, Uruguay. We want to offer thanks for comments and advice by Peter Foldvari, Peter Lindert, Leonardo Monasterio, Leandro Prados, Eustaquio Reis, Jim Robinson, Jan Luiten van Zanden, Jeffrey Williamson, and participants at workshops and congress sessions on income inequality at Universidad de Valencia, 1er Congreso Latinoamericano de Historia Económica (Montevideo 2007), XIV International Economic History Congress (Helsinki 2006). The usual disclaimers apply. We also want to thank Tania Biramontes for excellent research assistance. Luis Bértola also thanks Universidad Carlos III, Madrid, and Harvard University, where he was hosted as Visiting Professor and partly developed this project. Henry Willebald wants to thank Universidad Carlos III for support to his research activity as a PhD candidate.

### Abstract:

Latin America is the most unequal region in the world and there is a lively debate concerning the explanations and timing of such high levels of income inequality. Latin America was also the region, not including European Offshoots, which experienced the most rapid growth during the first globalization boom. It can, therefore, be taken as an interesting case study for how globalization forces impinged on growth and income distribution in peripheral regions. This paper presents a first estimate of income inequality in the Southern Cone of South America (Brazil 1872 and 1920, Chile 1870 and 1920, Uruguay 1920) and some assumptions concerning Argentina (1870 and 1920), and Uruguay (1870). We find an increasing inequality trend between 1870 and 1920 which can be explained as a process of inequality both within individual countries and between countries. This trend is discussed along three lines: the relation between inequality and per capita income levels; the dynamics of the expansion to new areas, and movements of relative factor prices and of the terms of trade.

## **1. Introduction**

Latin America is the continent with the highest inequality levels. Economic growth has not changed the long-run trend. Quite on the contrary, income inequality has worsened in recent decades.

The origins of Latin American inequality are the subject of debate. While some scholars have stressed the colonial roots, others have emphasized the role played by the first globalization boom, or even the Import-Substituting-Industrialization (ISI) period.

Latin America is also a region which has been growing at an average world level, in a context in which growth rates at world level have been diverging. While Latin America is not a slow-growth region, no Latin American country has grown rapidly and well enough to be labeled as a developed country. An obvious question, then, is whether high inequality levels have been hindering Latin American growth or whether the lack of fast growth lies behind the relatively high inequality levels in a Kuznets-like approach.

The main goal of this paper is to provide new estimates of inequality in the Latin American Southern Cone (LASC) on the eve and at the climax of the first globalization boom, ca: 1870-1920, and to identify the underlying forces of the estimated inequality trends. In doing so, we will try to identify the interaction between globalization and different institutional settings.

## **2. History and theory**

According to a wide range of studies carried out between the 1950s and the 1970s the roots of Latin American underdevelopment were to be found in the colonial period, when both a domestic structure of economic concentration and international dependency relations were responsible for a pattern of development characterized by sluggish growth and high levels of social and economic inequality (Stein and Stein 1970, Cardoso & Faletto 1967 & 1979, Cardoso & Perez Brignoli 1979, Furtado 1974, Frank 1967, and many others). These authors usually had a negative view of what we now call the first globalization boom, as it combined an authoritarian construction of national states and reinforced the concentration of power and wealth in the hands of an oligarchy which, in turn, was highly dependent on markets, trading, finance, services and technology in the hands of foreign companies and states. Generally, these authors were critical of, but somewhat sympathetic with, the different attempts made by Latin American countries during the so-called ISI-period to change the basis for economic growth, promoting structural change, social transformation, improvement in social conditions, such as education and health, and what would later be labeled as a process of growth “from within” (Sunkel 1991). According to this tradition, the structural reforms promoted since the 1970s in most Latin American countries were seen as containing some good fundamentals, but promoting a development path in line with the long-run path based on high income and wealth concentration, international competitiveness based on a perverse pattern of specialization in low-skilled and natural resource-intensive sectors, and high volatility.

The intellectual atmosphere has shifted during recent decades towards different approaches which have taken for granted that Latin American backwardness was mainly a 20<sup>th</sup> century problem. In particular, the basic idea moved towards the notion that inward-looking growth, state interventionism, forced and artificial industrialization and different varieties of populism were the main causes of the disappointing economic and social outcomes of Latin American development until the 1980s. By going global and

following best practices Latin America should have caught up with developed countries, as the South-East Asian countries had recently done. Accordingly, what we now call the first globalization boom appeared as the golden path to development, and deviation from this path cost Latin America dearly.

During the last decade, the first globalization has been revisited by many scholars and many of them even reached Latin America. Jeffrey Williamson studied the period from many different points of view (Williamson 1995, 1999, 2002). His main message is that Latin America did relatively well during that period and could have done much better, had Latin America been less protectionist. Latin America also suffered an increase in inequality, due to the process of factor price convergence, which took place in line with the Heckscher-Ohlin approach: the price of land increased significantly in relation to wages, as long as immigration intensified. The terms of trade moved in favor of Latin America, strengthening the position of landowning classes and inhibiting structural change in the long run. These latter contributions help to nuance the strong pro-global points of view of the early 1990s.

Latin American economic history has also been revisited by other scholars. Neo-institutional economic history has been producing many comparisons between Latin and North America, in order to unearth the fundamental explanations for long-run growth. Engerman and Sokoloff (1997, 2000), North, Summerhill & Weingast (2000), Landes (1998), Robinson (2006), Acemoglu, Johnson & Robinson (2002, 2005), have all agreed with the previous thesis regarding the colonial roots of Latin American inequality and backwardness. Even though they differ with reference to the origins and causes of the institutional settings in Latin America, they all stress that the institutional setting that emerged soon after the conquest is the main explanation for long-run trends. The major features of these institutions were the concentration of wealth, mercantilism, religious and cultural intolerance, racism and exclusion, an authoritarian and centralized state, low human capital formation, limited political democracy and extensive presence of many kinds of privileges for the elite. Implicit in this line of research is the idea that what happened in Latin America during the last two centuries followed the path of this previous period and did not diverge from it. This resembles Braudel's ideas about the *longue durée*. However, long-run jails are no longer cultures, but institutions.

While the idea of the colonial heritage seems to be a plausible one, it does not necessarily mean that what happened in the following periods was almost a foregone conclusion. The following periods are being intensively discussed, especially the years following independence. As many authors have proposed (Prados 2007, Bates, Coatsworth & Williamson 2006), the way in which the independent states were built could have a lasting effect on the institutional setting of Latin American countries, contributing also to an understanding of the post-colonial era in Africa.

Similarly, what took place during the first globalization does not necessarily have to neglect the "colonial roots", but this period may certainly provide useful information towards an understanding of Latin American economic history.

Previous contributions to Latin American economic history all agree on the profound changes that occurred during the first globalization and on the variety of transitions in Latin America (Cardoso Faletto 1967, Duncan & Rutledge 1977, Cardoso & Pérez Brignoli 1979, Sunkel & Paz 1982, Bauer 1986, Glade 1986, Bulmer-Thomas 1994, Bértola & Williamson 2006).

The basic idea is that the opportunities provided by the first globalization promoted a drastic expansion of the agrarian frontier and radical changes in the distribution of assets among the population. At the same time, the power of the state was significantly strengthened, adopting the already mentioned authoritarian shape and content, which

certainly enforced the property rights of the elite. Latin American responses varied according to previous institutional settings and social structures, and also according to natural endowments and what has been labeled the commodity lottery. They also varied according to the different colonial heritages. As a result, Latin America became more unequal at the climax of the first globalization. In turn, these outcomes constituted different contexts in which the later process of import substitution took place.

The debate surrounding the role of inequality in growth has been growing. The literature is already well-known. The discussion on the Kuznets curve, which mainly focused on the impact of growth on inequality, has given way to the study of the impact of inequality on growth. From a neo-classical point of view, income inequality affects the formation of human capital negatively, reduces access to credit and generates political instability. Inequality has also received attention from other points of view. Income inequality puts limits on domestic demand, the domestic market does not allow sophisticated consumption to grow, thus hampering innovation and specializing in mass-production of low quality goods, the elite develops a limited consumption of luxuries without any positive impacts on the domestic economy (Willebald 2006).

The present paper concentrates on Latin America's Southern Cone (LASC). The reason for selecting this sample is quite simple: these are the countries we understand best and for which we have best information. The objective is to include more countries in the future, especially México. However, LASC is a defensible unit of analysis from different points of view. Geographically, the region includes the temperate areas which can be considered as an extension of the European frontier. Except for its Southern provinces and states, Brazil is not well-suited to such criteria. LASC, from another point of view, includes examples of the three main transitions to capitalism in Latin America, to be found in many typologies: the slave economies (Brazil); the highlands where pre-Columbian population was mainly concentrated, becoming the core of the conquest (Chile could be considered an example, even if it is not a classical case), and the settler economies, represented by Argentina and Uruguay.

Each country case deserves detailed studies and considerations. The emphasis of this paper, however, is to try to consider them as a single unit and to extract some lessons from their common features and from the extent to which their features are common.

### **3. Estimating inequality in the Southern Cone**

#### *Antecedents*

Many efforts have been made during recent decades to increase the availability of information and the current situation has improved. However, serious problems persist and each attempt to discuss any economic history topic has to start by making a major effort to obtain data. This paper is no exception.

Williamson has repeatedly used rental-wage ratios and compared trends in different groups of countries (land- and labor-abundant; center and periphery, etc.), with quite interesting results. For the cases of Argentina and Uruguay, the trend during the first globalization boom is very clear: the rental-wage ratio increases significantly (Williamson 2002). This pattern is also common to other settler economies, such as Australia and New Zealand (see Graph 1). One of the shortcomings of these series is that they show very high changes and variations in terms of real distribution of income which are difficult to believe. What is more, they probably show the relation between the extreme components of the distribution, ignoring changes in the middle. Additionally, the wage data series are based on wages of unskilled workers, thus

excluding improvements in skill premiums. Another shortcoming of Williamson's proxies is that they are difficult to aggregate.

### **Graph 1 about here**

Prados (2005) constructed a GDP per worker series to compare with the real wage-index. This series must be less volatile. Besides, Prados reports nine-year moving averages. His results also indicate a trend of increasing inequality during the first globalization boom. This attempt, even though it is also valuable, may be subject to similar criticisms to those made of Williamson's. One of them is to compare real wage data deflated by consumer price indices, with estimates of GDP figures deflated by GDP deflators or simply estimated through volume estimates. In spite of all such criticisms, these estimates have been very useful and quite accurate in most cases.

The present paper is strongly inspired by similar concerns as those that inspired Bourguignon and Morrison (2002). Until some years ago, income distribution was discussed in two different and relatively independent ways. One strand of research centered on the convergence-divergence debate, i.e., the inequality trends in average per capita incomes between countries. Income distribution within countries was thus neglected. A second strand of research dealt with cross-section studies of country data-pairs for per capita income and distribution (Gini-coefficients). The aim of these studies was to establish correlations between levels of per capita income and inequality levels, most of them trying to find the Kuznets curve. Such studies were concerned with within-country inequality, and did not take international inequality into account.

B&M attempted to overcome the restrictions of both approaches through the construction of a world data base for 1820-2000, on the basis of national population, GDP, and inequality estimates. Using purchasing power parity GDP measures (Maddison 2001) and national inequality measures, the Gini-coefficients were transformed into deciles assuming a lognormal distribution. The average income of the different deciles could later be added to a single database.

The courageous attempt made by B&M faced several problems. The most important was the lack of historical data for many countries and regions. In order to bridge this gap, they made some important assumptions. In the case of Latin America, the assumption made was that inequality had not changed between 1820 and 1950. At first glance, this assumption looks completely unsustainable and absurd, especially as we have already shown evidence that income distribution in Latin America really did change over time. However, this assumption at least makes it possible to take changes in between-country inequality into consideration, as different countries grew at different rates both in per capita GDP and in population. An assumed Gini-coefficient "just" helps to measure the impact of other known components.

### ***The present estimates***

The present paper is part of a long-run line of research which aims to construct databases on income distribution in Latin America for the period 1870-1960, a time-span for which household surveys are not available. The objective is to work on a network basis, aiming to incorporate Latin America in world data bases.

Obviously, the underlying purpose is to approach the relation between income distribution and growth. Thus, after some years of work the present paper presents a first attempt to estimate income distribution in the Latin American Southern Cone.

### **Brasil**

A detailed presentation of the Brazilian estimate may be found in Bértola, Castelnovo & Willebald (2008). The estimate uses Brazilian population census figures from 1872 and

1920. Both censuses contain information at province (19 in 1872) and state (21 in 1920) level, for 48 professions.

The strategy was to assign income to this population.

## **1872**

About 1.5 million of the estimated active population of more than 6 million people were slaves in 1872. They were assigned an income according to different reports on the cost of maintenance of slaves. As detailed information on the activity in which the slaves were involved is available, in cases in which the activity implied a special skill, the income was increased proportionally to the increase in the price of slaves with this special qualification. The difference was about 25%.

Obviously there were differences between the incomes of different slaves, women and men, in the access to land, production for own consumption, etc. Similarly the length of the working day and in alimentation could vary from place to place. It seems realistic, however, to assume that differences among slaves did not significantly increase total inequality in Brazilian society in 1872.

About 5% of the active population consisted of civil servants. Our database includes official information regarding the income of each and every one of them.

Our third important group of data is the list of voters at municipal level. Unfortunately, this kind of information is very limited. We have access to complete lists for the state of Río Grande do Sul (RGS) and processed information for San Pablo (SP) (Klein 1995) and Río de Janeiro (RJ) (Nunes 2003). Fortunately, the limit of incomes to be declared in order to obtain the right to vote was extremely low: 200 mil-réis (slaves' "income" was estimated to be 64 mil-réis). The register for Rio Grande do Sul, kindly provided by Leonardo Monasterio, includes more than 3,000 observations, all of which indicate the profession of the voter, compatible with the census arrangement of professions, and income.

The available information for the lists for RJ and SP does not allow us to explore the distribution within each category (as in the case of RGS), but it permits us to compare the mean with that of RGS. The same distribution as in RGS was assumed in RJ and SP. Further, Brazil was arranged in five regions: Center-West, North, North-East, South and South-East. The incomes and distribution of RGS were applied to the South. The incomes obtained for SP and RJ were applied to the whole SE. In the case of the other regions, the distribution of RGS was assumed and the average income assigned was the lowest of the mean income of SP, RJ and RGS for each professional group.

With respect to women, the incomes assigned were 2/3 of similar male income. This was the average result obtained from many different sources of information. In the cases of capitalists and owners, and in the case of slaves, the same income as that of males was assigned.

For some professions and states other data from many different sources was incorporated with a marginal impact on the total result. As mentioned, the quoted paper by Bértola, Castelnovo & Willebald (2008) contains the analysis and many counterfactuals for the Brazilian data base. Here we simply use the crude database, which is arranged by profession, gender, sector (primary, secondary, tertiary and civil servants), income, state and region. The data base contains more than 5.3 million observations, out of an active population slightly above 6 million people.

## **1920**

This estimate is also based on the population census. We have assigned income to 8.1 million people out of an active population of 18 million. While we have already

produced four generations of databases for 1872, this is only the second one for 1920. The main sources for income are as follows.

- A list of 32,000 civil servants (out of 186,000) with detailed information on income and profession.
- A survey of wages in the secondary sector with the number of workers by 21 income intervals (8 male adult, 5 female adult, 4 male 14-20, 4 female 14-20), for 14 branches and 21 states. The survey covers about 1/5 of the total population registered by the census in these activities.
- Information on average wages for 10 categories of primary workers at state level (21).
- An estimate of the income of landowners according to census data on the size of farms and wage-ratios for 1920 and regional productivity differences for 1940.
- An estimate of industrial capitalists' incomes, using the industrial survey from 1920, and assuming the existence of one owner per enterprise.

If we expand our database to the whole of the active population according to the census and using our average income, we obtain a total income of 17.3 billion mil-reis, compared to 14.9 billion estimated by Goldsmith (1986, p. 147, Table IV-2).

## **Chile**

Detailed information on how the Chilean estimates were constructed can be found in Rodríguez (2007). The changing structure of the active population by sector of activity (agriculture, mining, manufactures, buildings, transport and communications, commerce, and others) was taken from Braun et. al (2000, tables, 7.1-2). These large sectors include several professions each. The weight of each profession within each sector was taken from the 1907 census. Additional disaggregation was carried out for some professions, such as the agrarian sector and mining. On the contrary, other professions were joined into fewer groups.

With respect to income, several different sources were used and made comparable for both years. When prices or incomes were not directly available, factor price series were applied to existing data in order to complete the information for both years. In other cases, the values are the result of interpolation between other available years.

## **Uruguay**

### **1870**

In the case of Uruguay we do not have our own inequality estimate for 1870. In Section 4 we will discuss the so-called Inequality Possibility Frontier as proposed by Lindert, Milanovic & Williamson (2007). According to the value obtained for Uruguay in 1920, and assuming a subsistence income of 400 international 1990 dollars, we obtained a figure to be used to help assign weight to other Uruguayan variables such as per capita GDP and population, by estimating a polynomial regression (third order).

### **1920**

The 1920 inequality estimate is provided by Bértola (2005) and takes into consideration an exhaustive series of civil servants, 8 income categories for industrial workers in 8 different industrial branches and the whole agrarian sector, including owners and tenants according to the size of farms, and wage earners. The data base covers about 70% of the active population.

## **Argentina**

Unfortunately it has not yet been possible to make much progress in the estimation of Argentine incomes. In order not to exclude the important role played by Argentina in the region with respect to per capita GDP growth and population growth, we have decided to make some reasonable assumptions regarding inequality in Argentina.

### **1870**

For 1870, a similar procedure to that used in the case of Uruguay was followed. Argentina is a larger and more diverse country than Uruguay. In order not to ignore valuable information regarding differences in regional per capita GDP in Argentina, we applied the Gini-coefficient obtained to any single province. Total inequality will be the result of similar within-province inequalities but some between-province inequality. One further problem for 1870, was the fact that differences in provincial per capita GDP were assumed to be the same as in 1920, following Llach (2004). Provincial per capita GDP figures provided by this author for earlier periods looked less reliable.

### **1920**

The Uruguayan 1920 Gini-coefficient was applied to each Argentine province for which reliable per capita GDP estimates are available. See Llach (2004).

## **Southern Cone**

The estimate of total inequality in the Southern Cone was obtained in the following way:

- The estimated or assigned country Gini-coefficients are transformed into deciles assuming a normal distribution.
- The average per capita income of each decile of each country is estimated using the purchasing power parity per capita GDP, according to Maddison (2001).
- Thus, each year's (1870 and 1920) estimate is the result of a database of 40 observations (10 country deciles and 4 countries; see Appendix Table 1).

This data base will allow us to see how much total inequality increased in the region as an aggregate of the changes produced within each country and between the four countries. This latter change derives from both changes in GDP levels and population. When reading the results on changes in within-country inequality we have to keep in mind that the 1870 and 1920 Argentine absolute inequality level for each province was assumed, as well as that of Uruguay in 1870. As will be discussed, the results are consistent with other proxies and we consider we have made a moderate assumption regarding the inequality increase in Argentina and Uruguay.

## **3. Growth and Inequality**

### **Growth**

The first globalization boom was characterized by very rapid economic expansion in new areas. GDP growth in LASC and in the USA was 70% higher than the world average and six times higher than that of the 12 leading Western-European countries. GDP growth in the USA was slightly above that of LASC.

Population grew faster in the LASC than in the USA, due to the well-known fact that Latin European emigration took place later than North-European (Hatton & Williamson 1994) and due to the "delayed" Latin American growth (Halperin 1985, 1999).

Per capita GDP growth in the USA was 20% higher than that of LASC. However, the growth rate of the latter was remarkable: 40% higher than that of the Western-European countries (see Table 1).<sup>1</sup>

#### **Table 1 about here**

Within LASC, several differences can be observed. Argentina stands out, growing faster than the others in all respects. Brazil and Uruguay experienced rapid population growth, but per capita GDP did not rise much. The population of Chile did not grow much, but a higher per capita GDP compensated for this.

As a result, an important shift occurred between 1870 and 1920 mainly in the Argentine and Brazilian shares of total income: while the first doubled, the latter was reduced to almost half of previous values. What is more, Argentine income surpassed that of Brazil, which had almost tripled the Argentine level in 1870. The mean income of Argentina reached almost 4 times that of Brazil in 1920. Chile and Uruguay also had much higher mean incomes than Brazil.

#### **Table 2 about here**

### **Inequality**

As shown in Table 3, all the measures reported indicate that inequality grew significantly in the Southern Cone during the first globalization boom. All the so-called Kuznets-coefficients report a coherent picture of increasing inequality. In all cases the relations between the income shares of a poorer group of the population and a richer one, show a reduction of the relation in detriment of the poorer. The General Entropy Indices, as well as the Gini, tell the same story. What is more, the changes are so huge that many modifications would have to be introduced in the data to obtain a different picture.

#### **Table 3 about here**

According to Table 4, distribution of income in all the countries worsened. The clearest cases are those of Brazil and Chile, as our estimates for these countries cover both periods of time. The increasing inequality in Argentina and Uruguay are not surprising, as the values were assigned (except for Uruguay 1920). In our defence we can argue that all the other available inequality proxies confirm the existence of a negative trend (see next section). In the case of Argentina we can also argue that we are underestimating the differences arising from uneven per capita GDP growth in different provinces. By keeping relative per capita GDP at province level constant, we are only capturing inequality differences arising from uneven population growth, but not from uneven per capita GDP growth. Much evidence points to the fact that Buenos Aires and the provinces of the *Pampa Gringa* (especially Santa Fe and Córdoba) as well as Mendoza and Tucumán, could have grown at faster rates than other backward regions. Table 4 also shows results concerning that part of inequality that can be explained by within-country changes, and the part arising from changes in inequality between countries. The latter is a more reliable indicator and also shows a significant increase. This could be expected from the different rates at which different countries grew, but the final outcome is not obvious.

#### **Table 4 about here**

The low inequality level of Brazil in 1872 is a very surprising result. This is the fourth database that our team has produced. Each new version attempted to increase the variety of data by regions, professions, etc, with the idea that important information had not

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<sup>1</sup> For 1870-1913, the growth rates of the per capita GDP of Latin America and Europe were 1.8 and 1.3 respectively.

been included. Much work remains, especially regarding the estimation of the income of the elite, but it is striking that all the results obtained until now have fluctuated between a Gini-coefficient of 38 and 40. Is this a realistic result? This topic will be tackled in next section.

#### 4. Inequality and per capita GDP level

The low inequality levels obtained for Brazil in 1872 were very surprising, as Brazil is nowadays one of the most unequal societies in the world. A slave society in 1872 could also be expected to show an extremely unfair distribution of income. This paradox suggested several avenues of research. As already mentioned, one such line was to find better data, especially with reference to regional inequality. Secondly, if the low inequality levels of 1872 were confirmed, we wondered how they could be explained. Thirdly, we needed to be able to identify when and why inequality grew to the high levels reached since the 1950s.

As mentioned, all our efforts to “raise” the Gini resulted in failure which meant that we had to pursue the second line of research. We found an interesting framework in Lindert, Milanovic & Williamson (2007). Their basic idea is that the level of possible inequality, the *inequality possibility frontier (IPF)*, in their words, depends on the level of per capita income, the subsistence level for the majority of the population and the size of the elite that can appropriate the eventual surplus. They present a final equation as follows:

$$G^* = ((\alpha - 1) / \alpha) (1 - \varepsilon),$$

where  $G^*$  is the IPF for a certain level of per capita income,  $\varepsilon$  is the proportion of people belonging to a very small upper class and  $\alpha$  is the relation between average income and the subsistence income. In other words, an economy at a very low level of development, where average income is not much higher than subsistence level, does not produce a surplus large enough to allow for high inequality levels.

The authors present a theoretical IPF-curve, assuming that the elite is 0.1% of the population and that subsistence income is 300 or 400 international purchasing power parity dollars (the latter figure is used by Maddison as an historical benchmark).

Their results are plotted in Figure 1, together with ours.

##### Figure 1 about here

In Appendix Table 2 we present two panels with the comparison between our estimates and the theoretical results of applying equation (1) to our data.

If we introduce Brazil’s mean income to LMW’s equation, we obtain a very good fit of our estimate to the curve, showing that Brazil was, both in 1872 and in 1920 (Panel A), almost on the IPF-curve: the Brazilian elites were extracting from the working population all potential surplus.

However, the situation is not so simple. The fact that the subsistence level obtained for Brazil is much lower than the one estimated by Maddison and used by LMW represents a serious problem. Our 1990 PPP\$153 for 1872 (the income of the first decile) is half the downward correction introduced by LMW as an Asian PPP. When using our real subsistence income values in Panel B, the available surplus increases significantly and the IPF rises to 79. Our estimate is half of that value. How can this be explained?

One possibility follows the line taken by previous studies of the American abolition of slavery. As long as slaves are capital to take care of, the “income” of slaves is later shown to be higher than the real subsistence income or the income available in post-slave economies, with an important supply of unqualified labour. The reduction we

obtain in the income of the first decile between 1872, even if hardly acceptable, points in this direction. Thus, the low inequality level in 1872 could be partially explained as the combination of a low per capita income and the interest of slave-owners of keeping their investment in slaves in good shape.

A second possible explanation is that the Brazilian (and other LASC countries) per capita GDP series are wrong. If this is correct, per capita GDP did grow less than estimated. This has nothing to do with our direct inequality estimates, which are performed at current domestic prices. This question will be addressed in our future research.

In short, even though many compatibility problems between our inequality estimates and Maddison's long-run series remain, the low inequality measures obtained for Brazil in 1872 cannot be disregarded as being unrealistic.

On the other hand, the LMW approach appears to be an interesting one in the discussion regarding the relation between real and potential inequality and thus the role of different institutional arrangements and structural features.

## **5. Inequality and globalization**

### **Globalization**

Globalization can be defined as a process of declining spread between commodity and factor prices at different points of a market. The underlying forces can be the reduction of tariffs and other barriers to the mobility of factors and goods and the reduction of transport and other transaction costs.

The first globalization boom was mainly driven by technological and organizational changes in the transport sector, both maritime and land. The reduction of real freight prices was impressive: the North freight rate index for American export routes (North 1958) dropped by more than 41 percent in real terms between 1870 and 1910, while the British index fell by about 70 percent between 1840 and 1910 (Bértola & Williamson 2006).

However, in the case of LASC, the impact was somewhat lower: average freight costs between Montevideo and Liverpool fell annually by 0.7 percent between 1870 and 1913 (Bértola 2000: Table 4.1, p. 102). Juan Stemmer, however, has shown (1989: p. 24), that overseas freight rates fell much less in the case of the southward leg than in that of the northward leg. This means that bulky South American exports benefited more from freight reductions than more valuable imports per unit of weight.

Even railroads made their contribution to the reduction of economic distances. In the case of the small Uruguayan territory, railroad tariffs decreased by 3.1 annually between the 1870s and 1913 (Bértola 2000: Table 4.1, p. 102). This fall in prices has to be added to the relative cost reduction between railroads and traditional means of transport.

### **Expansion of the frontier and inequality**

The immediate consequence of these transport price reductions was the improvement in the competitiveness of Latin American production on the basis of the exploitation of natural resources. As the world became smaller in economic terms, new areas could compete at an advantage, meeting an increasing demand on world markets, driven by rapid per capita income growth and industrialization in Europe. Besides, the fast domestic growth of the USA was consuming an increasing share of America's agrarian surplus.

The impact of these freight price changes on the productive front can be approached with the help of Figure 2. Different economic activities are arranged according to the

relative productivity in the center and in the periphery. Transport costs determine the width of the range ( $Z^x-Z^m$ ) within which goods are not tradable, as transport costs outweigh differences in productivity. As freight costs are reduced, trade is created, thus increasing the range of tradable activities in both the South and the North. The creation of employment, of course, will depend on the features of the export sectors.

#### **Figure 2 about here**

Accordingly, the agrarian frontier advanced at high rates, mainly on the Atlantic coast of LASC. In the case of Argentina, a country with an extensive open frontier, the land-labor index moved from 29 to 100 between 1883 and 1911 (Williamson 2002, Appendix Table 3) in spite of very rapid population growth, implying an increase in the number of hectares per worker. The same situation affected Brazil, where the leading region was the South East, which experienced its own “conquest of the West” and South. The smaller Uruguay, on the contrary, without an open frontier to occupy, saw how the land-labor ratio was reduced by half during the same period, implying that the territory had twice as many people per hectare in 1911 as in 1883. A similar trend can be found in the core of the Buenos Aires region.

Chile was not an exception and expanded its frontier both towards the South and the North, especially after the War of the Pacific. The Northern region was rich in nitrates, copper and guano. Besides, the Panama Channel should have a great impact in transport costs with the Atlantic. This impact, however, should be more important after the period we are dealing with.

The expansion of the frontier implied major changes in the distribution of the population in the territory and subsequently in the distribution of income, depending on the relative per capita income of each region. The Argentine Pampas grew very rapidly in relation to the less dynamic inland. The population of the Pampa Gringa and Buenos Aires increased from 60 to 80% of the total population.

In Brazil, as shown in Table 5, regional inequality grew three-fold between 1872 and 1920. The stagnating and poor North-East lost ground to the dynamic South and South-East, in terms of both population share and average per capita income. The income share of the South and South-East increased from 41 to 67%.

#### **Table 5 about here**

Finally, considering the LASC as a whole, between-country inequality increased more than three-fold, as shown in Table 4. This analysis will be enriched when more reliable information is available for the different Argentine regions. It will then be possible to study the LASC as the sum of about 12-14 regional economies instead of 4 countries.

Regional inequality depends also on the so-called commodity lottery. Economic growth was strongly dependent on the availability of natural resources. Moreover, economic growth depended on how demand, prices and international competition changed in these different commodity markets. In Bértola & Williamson (2006) these features were analyzed from the point of view of the international commodity markets and the dominant labor markets in these commodity markets. The Argentine Pampas, Uruguay and Southern Brazil produced similar commodities to those produced in core countries by high income peasants, who set a high marginal price for their products, also due to the high price of land. Countries producing tropical crops in competition with labor abundant economies could hardly be competitive if paying high wages, unless some kind of monopolistic position was taken, as in the case of the coffee plantations in Brazil. The production of minerals used to be highly concentrated in space and faced varying degrees of market competition. The commodity lottery was thus favorable for temperate regions such as those of the Río de la Plata, for the almost monopolistic coffee production in Brazil and for the Chilean nitrates. However, the rubber plantations

of Northern Brazil, for example, faced drastic changes in international competitiveness, first challenged by Indonesian production and later by synthetic rubber.

### **Globalization and relative factor prices**

The Brazilian and Chilean cases point to the fact that inequality also increased within each country. As shown in Table 5, inequality also grew within each single Brazilian region.

One important economic force can make an important contribution to the understanding of within-region inequality: relative factor price movements. The previously mentioned inequality estimates for Latin America during the first globalization (Williamson 2002, Prados 2005, Bértola 2005) were based on the estimation of these variables.

The Heckscher-Ohlin model predicts an increase in the relative price of natural resources, the abundant factor, in relation to wages. Graph 1 shows how important these relative price movements were in different economies of new settlement.

The impact of these price movements on inequality is not obvious and depends on several social and institutional factors. If land is highly concentrated and labour demand is relatively scarce, inequality will probably rise more than if land-concentration is relatively low, immigrants have access to land and relative labor supply is low. This contrast has been exemplified by Adelman (1994) who compared the Pampas and Canada. Political institutions play a very significant role, as they define policy of access to land, the control of labor, etc. Recently, Alvarez (2007) has shown how the distribution of wealth (land, in this case) in New Zealand and Uruguay had a huge impact on the functional distribution of income. While in New Zealand the state owned an important share of the land and had an important impact on the level of land rents, in Uruguay the state was completely absent. This different distribution of wealth led to a quite different distribution of income between wages, profits and land rents. In the institutional framework of a slave economy, wages are doomed to remain close to subsistence minimum, but post-slave societies may face even worse conditions in a context of a large labor surplus, racial discrimination and authoritarian regimes.

### **Terms of trade and inequality**

The first globalization boom was followed by a positive terms of trade shock for most Latin American countries. Improved terms of trade were the result of many different forces. The first, and probably the most important one, was the previously mentioned reduction of transport costs. This particular force has the peculiarity that it may have produced the same impact on both sides of the Atlantic economy. This is because export prices are usually recorded at FOB prices, while import prices are CIF prices, thus registering the contraction of freight costs (Coatsworth & Williamson 2002).

According to Graph 2, terms of trade in both Latin America improved. So they did in Europe (Williamson 2002). An expected result is, however, that the terms of trade improvement trend will disappear in relation to the exhaustion of the effect of the revolution of transports. What is more, this seems to have coincided with the critical situation during WWI, when freight prices increased considerably.

#### **Graph 2 about here**

Terms of trade are also extremely volatile, depending on the demand for and prices of particular commodities. As the Latin American countries were highly dependent on a few natural resources, changing terms of trade had a huge impact on relative domestic prices.

The impact of terms of trade on income distribution is also highly dependent on the structure of exports, on social and institutional factors, as well as on the per capita income of the population.

Given the agrarian origin of LASC exports, there tends to be a direct correlation between terms of trade and relative factor prices, as shown in Graph 3.

### **Graph 3 about here**

A particular case is the Chilean one during the age of the nitrates. As export incomes were highly concentrated in foreign enterprises, the improved terms of trade did not have a huge impact on domestic inequality. However, when considering the functional distribution of income between wages and profits, the impact on inequality is clearly noticeable (Rodríguez 2007, Graph 11).

In the case of Brazil, the terms of trade did not improve, or even worsened. However, the construction of regional export price indices may reveal the existence of important differences.

## **Summary of findings and agenda for future research**

This paper presents a first generation of direct estimates of income inequality in the LASC countries. The evidence presented is of varied quality, including relatively good estimates for Brazil, Chile and, in part, for Uruguay, combined with some assumptions regarding Gini-coefficients for Argentina, 1870 and 1920 and Uruguay, 1870.

The results may have underestimated inequality increases in Argentina, as only changes in the distribution of population among its provinces were taken into consideration.

The picture obtained is that of an important increase in LASC inequality between 1870 and 1920. This increase is the result of many different, but reinforcing forces:

1. Population increased at different rates and grew more in countries and regions with higher average per capita income.
2. Per capita income grew at different rates in different countries and regions. Highly populated and relatively high-income Argentina grew faster than populous Brazil. Relatively high-income regions in Brazil grew faster than poor ones.
3. The combination of these first two factors resulted in a three-fold increase in between-country inequality.
4. Within-country inequality grew in Brazil and Chile, and probably in Argentina and Uruguay too, as also suggested by complementary proxies for income inequality, such as land-labour ratios, per capita GDP-real wage ratios and terms of trade. Moreover, a major increase in inequality is also noticeable at the within-region level. This situation was experienced by every Brazilian region.

The objective of this paper is not to present detailed national or regional studies, but to concentrate on the global view. Some lines of interpretation of the trends discovered are as follows:

1. Globalization implied a drastic reduction of transport prices and introduced changes in the set of tradable goods in the Atlantic economy. Changes in relative productivity favored a dramatic expansion of the frontier and an increasing demand for labor. While “old” areas saw how the land-labour ratios diminished, others, like the Argentine West, experienced an important increase in this ratio. As an outcome, high-income, export-led regions increased their shares in total population and total income, producing increases in between country and between-region inequality. What is more, countries and regions producing commodities similar to those produced in the core countries were able to achieve

higher levels of per capita income, as the prices of their commodities were set by the production in high-income European countries, with high land prices.

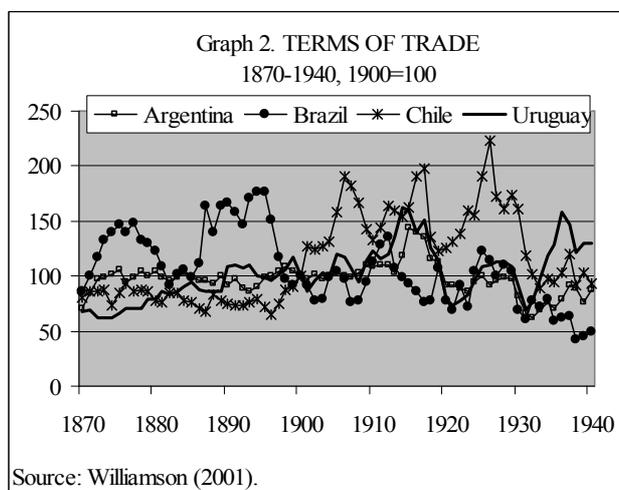
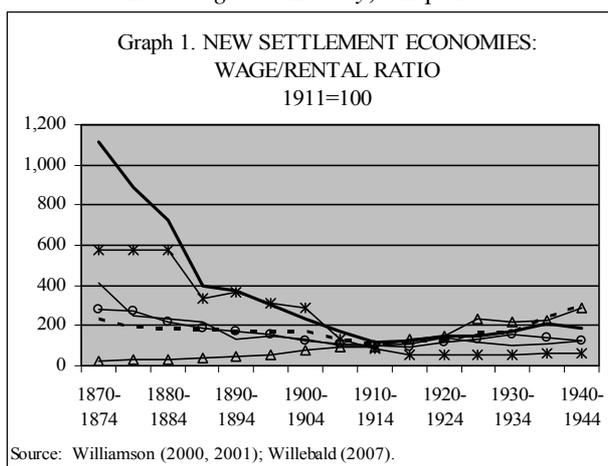
2. Within-country and especially within-region inequality were also fueled by relative factor price movements. Prices moved *a la* Heckscher-Ohlin resulting from factor movements across the Atlantic, making the price of land, the abundant factor, rise and that of labor, fall in relative terms. There is sound evidence in this area. The special way in which these price movements impact on the distribution of income depends on the distribution of assets. The highly concentrated pattern of landownership, compared to other settler societies, makes it possible to conclude that the impact of this factor was important.
3. The paper leaves the field open for more detailed institutional studies on factors which make it possible to explain the difference between the Inequality Possibility Frontier and the real inequality in different countries and regions. Differences arising from quite different institutional settings, such as the transition from a slave to a free labor economy, or the expansion towards the frontier on the basis of immigrant labor, leave ample space for the debate on the role of institutions and inequality for growth. Further contributions within the framework of the present project will tackle these issues.

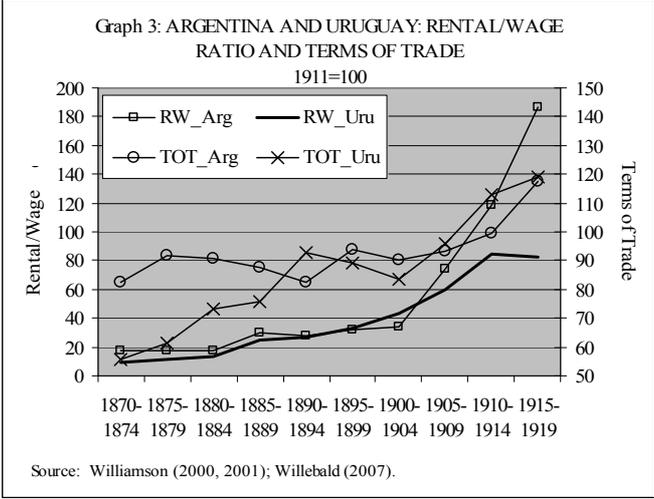
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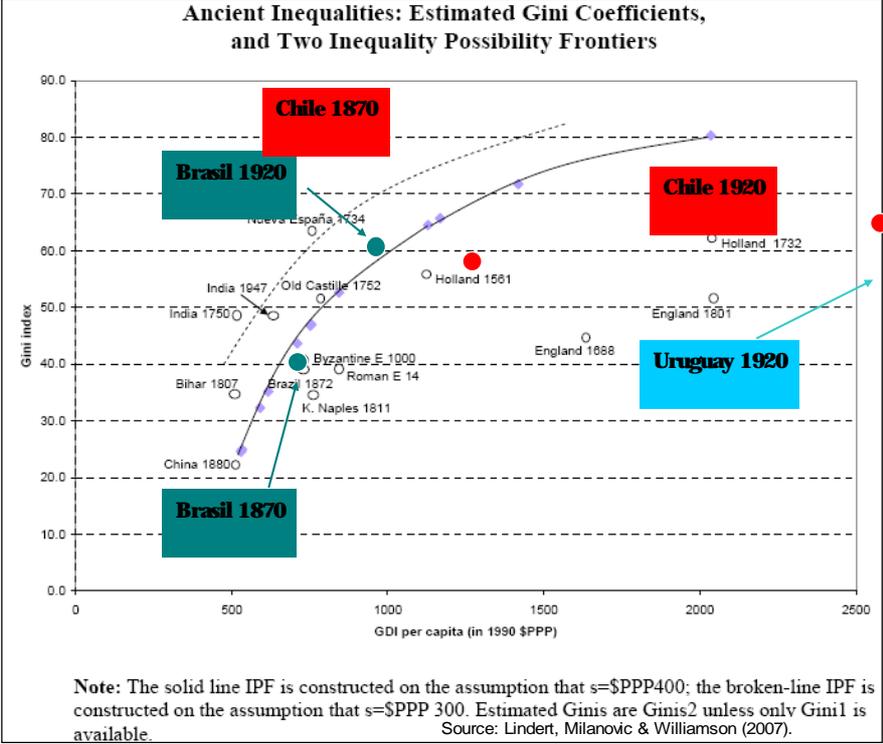
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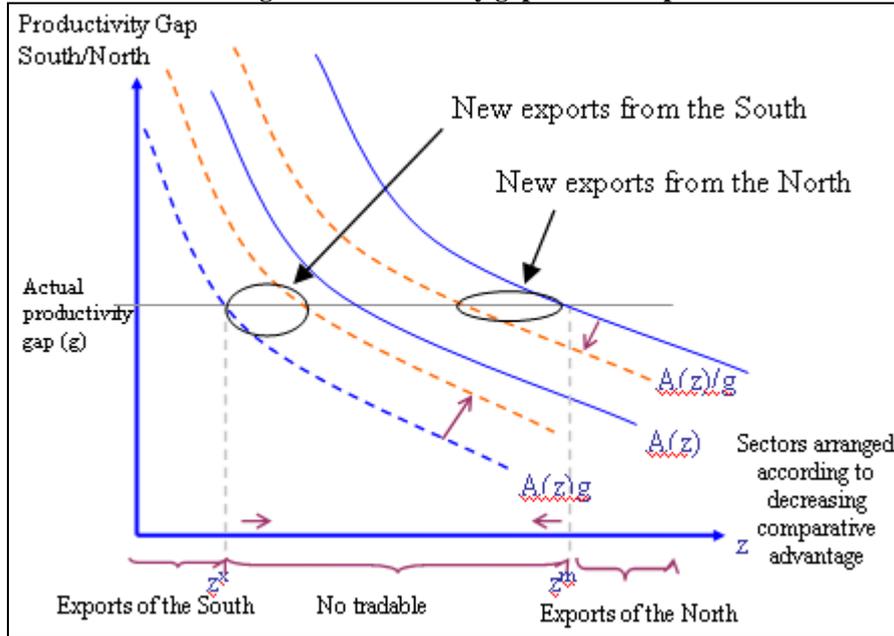




**Figure1. The Inequality Frontier Curve**



**Figure 2. Productivity gaps and transport costs**



**Table 1. Population, GDP and Per capita GDP Growth of the Southern Cone, USA, Western Europe and the World, 1870 and 1920.**

	Argentina	Brazil	Chile	Uruguay	SC	USA	W. Europe 12	World
Population (1000)								
1870	1,796	9,797	1,945	343	<b>13,881</b>	40,241	162,386	<b>1,271,915</b>
1920	8,861	27,404	3,723	1,371	<b>41,359</b>	106,881	223,731	<b>1,791,323</b>
Growth %	493	280	191	400	<b>298</b>	266	138	
annual rate	3.2	2.1	1.3	2.8	<b>2.2</b>	2.0	0.6	<b>0.8</b>
GDP (1990 Geary-Khamis dollars)								
1870	2,354	6,985	2,509	748	<b>12,596</b>	98,374	339,103	<b>1,112,655</b>
1920	30,775	26,393	10,305	3,666	<b>71,139</b>	593,438	739,408	<b>2,732,131</b>
Growth %	1,307	378	411	490	<b>565</b>	603	218	
annual rate	5.3	2.7	2.9	3.2	<b>3.5</b>	3.7	1.6	<b>2.1</b>
Per capita GDP (1990 Geary-Khamis dollars)								
1870	1,311	713	1,290	2,181	<b>907</b>	2,445	2,088	<b>875</b>
1920	3,473	963	2,768	2,674	<b>1,720</b>	5,552	3,305	<b>1,525</b>
Growth %	265	135	215	123	<b>190</b>	227	158	
annual rate	2.0	0.6	1.5	0.4	<b>1.3</b>	1.7	0.9	<b>1.3</b>

Maddison, A. (2003).

World: 1913 instead of 1920.

**Table 2. The distribution of population and income among the SC countries, 1870 and 1920.**

	Pop share	Mean Income*	Rel.mean	Income Share	log(mean)
1870					
Ar	0.13	1,311	1.44	0.19	7.18
Br	0.71	713	0.79	0.55	6.57
Ch	0.14	1,290	1.42	0.20	7.16
Uy	0.02	2,181	2.40	0.06	7.69
1920					
Ar	0.21	3,473	2.02	0.43	8.15
Br	0.66	963	0.56	0.37	6.87
Ch	0.09	2,768	1.61	0.14	7.93
Uy	0.03	2,674	1.55	0.05	7.89

\* 1990 Geary-Khamis international dollars.

**Table 3. Distribution measures for the Southern Cone, 1870 and 1920.**

	p90/p10	p90/p50	p10/p50	p75/p25
1870	12.183	3.533	0.290	3.002
1920	36.516	6.324	0.173	5.860
<hr/>				
	GE(0)	GE(1)	Gini	
1870	0.415	0.439	0.486	
1920	0.897	0.821	0.653	

**Table 4. Inequality indices of the SC, 1872 and 1920: by country, within-countries and between-countries.**

	Country indices			Within-country		Between-country	
	GE(0)	GE(1)	Gini				
1870				0.363	0.382	0.052	0.057
Ar	0.513	0.477	0.522				
Br	0.264	0.255	0.392				
Ch	0.715	0.643	0.594				
Uy	0.421	0.397	0.481				
1920				0.721	0.640	0.176	0.180
Ar	0.654	0.595	0.574				
Br	0.725	0.651	0.597				
Ch	0.886	0.776	0.641				
Uy	0.618	0.565	0.562				

**Table 5. Brazilian inequality, 1872 and 1920.**

	Pop. Share		Income Share		Mean Income (mil-réis)		Relative mean	
	1872	1920	1872	1920	1872	1920	1872	1920
Center -West	2.7	2.7	3.0	3.1	276	3,179	1.13	1.20
North	3.5	5.3	3.9	4.2	291	2,084	1.11	0.79
North-East	48.5	37.4	52.1	25.7	287	1,817	1.07	0.68
South	7.7	11.2	9.9	16.3	331	3,824	1.28	1.44
South-East	37.5	43.4	31.1	50.7	213	3,092	0.83	1.16
<b>Region</b>		<b>GE(0)</b>	<b>GE(1)</b>	<b>Gini</b>				
<b>1872</b>								
Center -West		0.258	0.287	0.389				
North		0.264	0.303	0.394				
North-East		0.225	0.254	0.360				
South		0.240	0.269	0.372				
South-East		0.337	0.393	0.441				
<b>1920</b>								
Center -West		0.701	1.067	0.624				
North		0.516	0.808	0.545				
North-East		0.637	1.027	0.595				
South		0.627	0.958	0.595				
South-East		0.617	0.891	0.593				
<b>Within-region</b>								
	1872	0.271	0.301					
	1920	0.623	0.939					
<b>Between-region</b>								
	1872	0.011	0.011					
	1920	0.039	0.038					

**Appendix Table 1. Per capita GDP by deciles in the Southern Cone countries, 1870 and 1920 (1990 Geary-Khamis dollars).**

Country	1870		1920	
	Nber	Income	Nber	Income
Argentina	179600	237	886100	248
Argentina	179600	405	886100	523
Argentina	179600	545	886100	799
Argentina	179600	689	886100	1121
Argentina	179600	852	886100	1519
Argentina	179600	1045	886100	2039
Argentina	179600	1292	886100	2767
Argentina	179600	1638	886100	3893
Argentina	179600	2213	886100	6012
Argentina	179600	4189	886100	15811
Brazil	979700	153	2740400	58
Brazil	979700	250	2740400	126
Brazil	979700	328	2740400	198
Brazil	979700	407	2740400	282
Brazil	979700	494	2740400	389
Brazil	979700	595	2740400	530
Brazil	979700	722	2740400	730
Brazil	979700	897	2740400	1046
Brazil	979700	1181	2740400	1653
Brazil	979700	2103	2740400	4619
Chile	194457	79	372260	114
Chile	194457	173	372260	269
Chile	194457	269	372260	440
Chile	194457	383	372260	652
Chile	194457	526	372260	929
Chile	194457	716	372260	1308
Chile	194457	985	372260	1866
Chile	194457	1408	372260	2778
Chile	194457	2218	372260	4612
Chile	194457	6145	372260	14715
Uruguay	34300	556	137100	209
Uruguay	34300	869	137100	432
Uruguay	34300	1109	137100	653
Uruguay	34300	1347	137100	907
Uruguay	34300	1604	137100	1219
Uruguay	34300	1898	137100	1623
Uruguay	34300	2261	137100	2183
Uruguay	34300	2748	137100	3043
Uruguay	34300	3520	137100	4643
Uruguay	34300	5895	137100	11828

**Appendix Table 2: Estimated Gini-coefficients and the Inequality Possibility Frontier for the Southern Cone countries, 1870 and 1920.**

**Panel A: elite as 0,1% of the population and subsistence income at \$400 1990-PPP.**

		%G-real/IPF	G-real	IPF	$\alpha$	$\varepsilon$	mean	subsistence income
Argentina	1872	0.75	0.52	0.69	3.28	0.1%	1311	400
	1920	0.65	0.57	0.88	8.68	0.1%	3473	400
Brasil	1872	0.88	0.39	0.44	1.80	0.1%	721	400
	1920	1.02	0.60	0.58	2.41	0.1%	963	400
Chile	1870	0.86	0.59	0.69	3.23	0.1%	1290	400
	1920	0.75	0.64	0.85	6.92	0.1%	2768	400
Uruguay	1872	0.59	0.48	0.82	5.45	0.1%	2181	400
	1920	0.66	0.56	0.85	6.68	0.1%	2674	400
Averages								
	1872	0.75						
	1920	0.75						
	total	0.77						

**Panel B: own estimate of subsistence income (1990-PPP).**

			G-real	G	$\alpha$	$\varepsilon$	mean	subsistence income
Argentina	1872	0.64	0.52	0.82	5.52	0.1%	1311	237
	1920	0.62	0.57	0.93	14.03	0.1%	3473	248
Brasil	1872	0.50	0.39	0.79	4.71	0.1%	721	153
	1920	0.64	0.60	0.94	16.65	0.1%	963	58
Chile	1870	0.63	0.59	0.94	16.27	0.1%	1290	79
	1920	0.67	0.64	0.96	24.29	0.1%	2768	114
Uruguay	1872	0.65	0.48	0.74	3.92	0.1%	2181	556
	1920	0.61	0.56	0.92	12.82	0.1%	2674	209
Averages								
	1872	0.60						
	1920	0.63						
	total	0.62						