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Innovation and Spatial Dynamics**

## **History with Some Evidence: Inequality Levels of Argentina and Australia at the Turn of the 20th Century**

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*Abstract:* Institutional theory of economic growth argues that the long-term development of a country is greatly influenced by quality of its institutions. On its turn, good institutions would form more naturally in countries with better income distributions than more unequal countries. One of the main references used to support this idea used by researchers is the case of Latin America, especially Argentina. In particular, Engerman & Sokoloff (2000) claim that Latin America (Argentina included) had always had higher inequality than the rest of the world, explaining its poor economic performance in the 20th century. Unfortunately, data on this topic for that period is not abundant nor does it promptly prove without any doubts that inequality in Argentina compared to the rest of the world was high enough to explain Argentina falling behind. By comparing Argentina's inequality to Australia (a country considered similar to Argentina in the period of the analysis), this study attempts to review the evidence on inequality of the two countries and see if the evidence really supports a higher inequality in Argentina than in Australia and then see if such evidence supports the claims of the institutional theory. The result of such an evaluation of the available evidence points that inequality in Argentina may not have followed the more simplistic story offered by Engerman & Sokoloff, instead the evidence seems to point that Argentina may even have had a more egalitarian distribution of income than Australia at the turn of the century.

*Key words:* Inequality, economic growth, income levels

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## 1. Introduction

The institutional theory of economic development has many variants, but they all focus on the role of institutions for economic development. While there are many illustrations as to how those institutions affect growth, the main question is what causes good institutions to arise in the first place. One common explanation that is provided is that differences in income distribution would be the leading cause of it. In an attempt to find out and test this hypothesis, many researchers have turned to Latin America at the turn of the 19<sup>th</sup> century and early 20<sup>th</sup> century, in particular to Argentina. These researchers often claim that the underperformance of Latin America when compared to other developed countries is due to its high levels of inequality. In this kind of research Argentina is often chosen as the Latin American country compared to other developed countries.

The problem, though, is that there is very little data available for the period and, as it will be seen on this paper, not as much attention on the subject of inequality is given to other countries that can be used as comparisons to the inequality levels of Latin America. The result of this is that the claim of a more unequal Latin America (especially Argentina) is not completely conclusive in light of the evidence available. It is not unusual in this literature to have Argentina compared to other settler economies. One country to which Argentina is compared is Australia, since, as it will be argued in the next paragraphs, they were quite similar in many ways to one another.

On the other hand, data on inequality for not only Argentina and Australia, but also other countries for the late 19<sup>th</sup> century and early 20<sup>th</sup> century are often rare to find and there is a general lack of a clear-cut figures on the topic to have a definite picture of the income distribution of the time. This is a particularly important point, since for many studies and theories it is taken for granted that Argentina, as well as the rest of other Latin American countries, were always more unequal than the rest of the world, while countries like Australia had more equal income distributions, even though the available evidence on such claims is not beyond questioning. This particular point is raised by Williamson (2009) in a provocatively named paper – *“History Without Evidence: Latin American Inequality Since 1491”* – in which he calculates figures for inequality for four Latin American economies that actually had lower Gini than many Western European nations at the turn of the 20<sup>th</sup> century.

So using the comparison of Argentina and Australia the goal of this paper is twofold: an attempt to find whether or not there is evidence of higher inequality in Argentina than in Australia and also to review the available evidence on inequality and see how likely and credible is the theory that differences in inequality could have explained the divergence between the two countries. It is not the goal of this paper to find evidence of causality between inequality and the divergence of the two countries, nor is it to find possible causes behind their divergence. Instead the paper will focus on the analysis of the evidence on inequality for the two countries with the purpose to see if such evidence is compatible with the thesis that inequality was higher in Argentina than in Australia.

In this paper two main analyses will be done, the first one will review in focus on inequality measures and the data available, and the second one will focus primarily on how the evidence for Argentina and Australia match the Engerman & Sokoloff (2000) theory. Therefore, in the next chapter a brief discussion of the diverging paths of Australia and Argentina will be made. In chapter 3 an analysis of the data on late 19<sup>th</sup>/early 20<sup>th</sup> century inequality for Argentina, Australia, Latin America and the world in

general will be done and it will be seen how reliable they are to check the institutional theory. In that chapter it will be discussed in light of the indicators gathered how likely the institutional theory is to explain the divergence of Argentina and Australia. In chapter 4 attention will be given to the Engerman & Sokoloff (2000) theory and the indicators listed by them as being critical outcomes of high inequality will be compared between Australia and Argentina and see if they tell the same story as the indicators of the previous chapter.

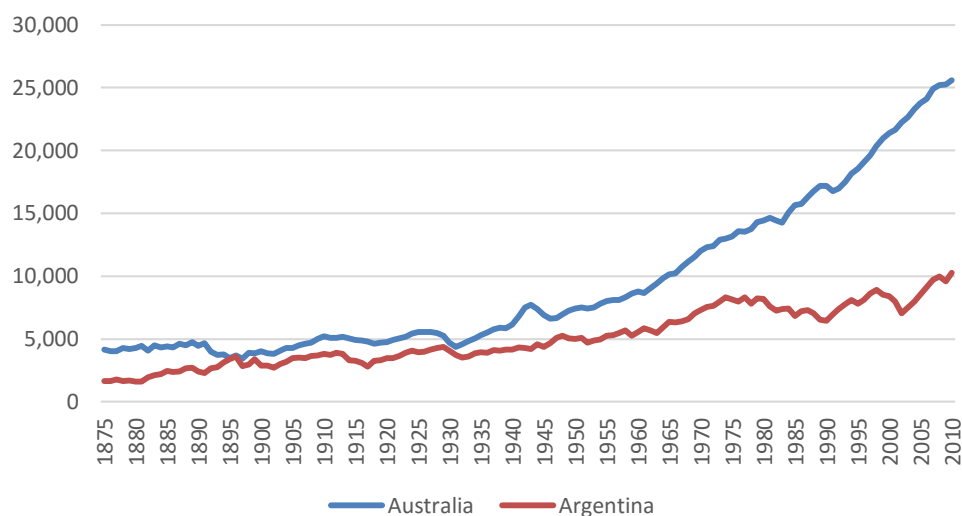
## **2. Argentina and Australia – Diverging Paths**

Nowadays it might seem odd to think of Australia and Argentina as similar countries with similar histories. While the first of the two is one of the richest countries in the world, the other is known as yet another Latin American country with poor economic performance, high inequality and a level of income nowhere near the levels of developed countries. But as historical investigations have shown in an unquestionable way, the story was entirely different at the beginning of the 20<sup>th</sup> century: Argentina and Australia actually shared many similarities, income levels included.

While Australia was considered to be the richest nation in the world during the second half of the 19<sup>th</sup> century (McLean, 2007), Argentina was considered to be one of the richest countries in the world, almost matching its income levels during the mid-1890s, although never surpassing Australian's levels of income (Maddison Project, 2016). Both countries were considered to be settler economies, due to the fact that they both shared many similarities such as: both were countries with great abundance of land, high immigration rates, high wages and an economy built around the production and exports of agricultural goods. As a matter of fact, other countries such as the United States and Canada were also considered to be settler economies back at that time and a good part of their economic success has been credited to that fact.

With data from the Maddison project, Figure 1 below shows the compared GDP per capita of Argentina and Australia as far back as 1875 (the year in which data is available for both countries). In Figure 1 below it is possible to see that the two countries shared similar income levels well into the 20<sup>th</sup> century, but after that the income differences become apparent and have continued to grow ever since.

Figure 1- GDP per capita Argentina x Australia (in Geary-Khamy 1990 dollars)



Source: Maddison Project, 2016

Although it is evident that Argentina and Australia went from being very similar economies with similar income levels in the beginning of the 20<sup>th</sup> century to two completely different countries in the beginning of the 21<sup>st</sup> century, it is not so clear as to when the divergences started to take place. In an attempt to find this out, Sanz-Villarroya (2005) carries out time series analysis of the GDP per capita of Argentina as a share of the Australian GDP per capita (Argentina is also compared to Canada and the OECD countries in that study) to find the years in which there are breaks in its series. By doing such an analysis it is found two critical years for the comparative history of Argentina and Australia: the years of 1899 and 1974.

The income levels of Argentina at the beginning of the period of the analysis were quite small compared to Australia (Argentina's GDP per capita corresponded to only 40% of Australia's GDP per capita), but Argentina quickly caught up with Australia up until 1899, a year in which the Argentine GDP per capita reaches the level of 88% of the one observed in Australia. But after the year of 1899, the two economies actually start to slowly diverge from one another at an average annual rate of -0.09%. This means that the two will share similar levels of income for some time, but the difference between them is already slowly building up. In 1974, another shift happens, in which the divergence trend is reinforced and the two economies start to diverge much faster from one another (at an average annual rate of -0.7%) (Sanz-Villarroya, 2005).

The divergence process after 1974 is credited by Sanz-Villarroya to the impacts of the oil crisis of 1973, which greatly increased the foreign debt of Argentina, causing deficits in the balance of payments that spiraled into hyperinflation and an overall scenario of macroeconomic instability. But the reason for the shift in 1899 is less evident, even though researchers have been suspicious that the causes of the differences in economic performance in Australia and Argentina date much further back than 1974. As a matter of fact, many researchers pay close attention to the end of the 19<sup>th</sup> century and the beginning of

the 20<sup>th</sup>. One of the most well-known schools of thoughts studying such diverging paths is the institutional school, of which the Engerman & Sokoloff theory of factor endowments is one of the most prominent.

The Sokoloff & Engerman (2000) thesis can be shortly summarized as follows: initial factor endowment differences between the colonies in the Americas have created different colonization processes that have caused initial differences in inequalities, which in turn have given origin to bad institutional arrangements that have made such inequalities (and the bad political and economic institutions) persist for a very long time. Although those initial inequalities and bad institutions would not cause such colonies to consistently underperform from day one compared to other colonies with more equal distributions and better institutions, the worse institutional arrangement would eventually pose a limit to the economic development of the colony. This particular thesis is focused on the colonization process of the Americas and may not be applicable to colonization processes carried out in different regions or different eras, so it may not directly apply to Australia. But that is not the point in itself, since this institutional theory shares one very important aspect with several other institutional theories of economic development.

For instance, while Acemoglu, Johnson & Robinson (2001) prefer to point out the differences in mortality rates in different American colonies as the initial factor that would trigger a series of events that would ultimately explain the differences in economic development between the American countries 500 years in the future, they also point out that the key mechanism through which this would happen would be in the initial differences in inequality that would arise from the initial institutions that were created to tackle with the different mortality rates at the beginning of the colonization process. Again this particular theory may not quite apply to the Australian case: the mortality rate of initial settlers may not have played as an important role in the colonization of Australia as it did in Argentina due to how far apart those processes were in time, but the differences in inequality might have.

As it is better explained in *Why Nations Fail* (Acemoglu & Robinson, 2012), initial differences in inequality can cause big differences in institutional arrangements, starting a process of either virtuous or vicious cycles that would perpetuate in the future good economic development, inclusive institutions and greater equality (or the opposite in the case of vicious cycles: poor economic development, exclusive institutions and greater inequality). This is not an exclusive point of those theories in particular. As a matter of fact, it is an integral hypothesis in institutional economics: more equal societies create more “good institutions” than unequal societies, and because of it they perform better.

Knowing the many similarities between Australia and Argentina in the late 19<sup>th</sup> and early 20<sup>th</sup> century and the widely different results of economic development currently seen in the two countries, it is natural that the two of them would be compared between each other in attempts to find possible causes to this split. And indeed there are many studies that compare the two of them, even though it is more common to find comparisons of Argentina with other settler economies (Canada, United States and to a lesser degree Uruguay and New Zealand) in general, and not exclusively compare it to Australia (González & Viego, 2011; Sanz-Villarroya, 2005; Solberg, 1985, just to name a few). The institutional approach has been used but mainly to understand how Argentina, one of the richest countries in the world in the beginning of the 20<sup>th</sup> century, has fallen behind (Di Tella, 1985; Mouzelis, 1986) or why Latin America as a whole has caught up with other more developed nations (Bértola et al., 2009; Williamson, 1999, again, just to name a few).



But a direct comparison of Argentina and Australia in light of the institutional approach has not been done many times. In *Drifting Apart* (Esposito & Tohmé, 2009), a comparison is made of Argentina and Australia and the argument is forwarded that the main reason behind the differences in performance of the two countries lie in their different institutional arrangements. The argument though is developed by comparing several Economic Freedom Indices from the Heritage foundation between the two countries in the period ranging from 1995 until 2008 (the years for which those indices were available). The findings do point to the fact that Australia seems to have greater economic freedom and overall better institutions than Argentina, but by 1995 the GDP per capita of Argentina (using Madison data) had already fallen to only 42% of that of Australia, far from the point in which in the two development paths started to diverge.

As is pointed out in by Sanz-Villarroya (2005), the Argentine GDP per capita of Argentina was converging to the Australian one up until 1899, at which point Argentina starts experiencing very similar growth to Australia, but slowly diverging (with an annual average convergence of -0.09%) up until 1975, after which the Argentine growth quickly dropped compared to Australia's. So when Esposito & Tohmé compare the Economic Freedom indices from Argentina and Australia, they have both missed the main periods of divergence between the two, making it difficult to claim that those differences in institutions are the cause, rather than the result of the diverging economic development of Argentina.

### **3. Measures of Inequality and the Available Evidence**

As mentioned in previous paragraphs, one essential part of the institutional school of thought is precisely the idea that differences in inequality would be the root of the institutional and economic development of any one country. Although Argentina is known to have always been an extremely unequal country, not much evidence is available for the period, and neither are there direct comparisons to Australia. So in this chapter data, evidence and previous papers on the topic will be collected and compared to see if there really seems to be any signs that Argentina was more unequal than Australia, which would lead to differences in institutions and economic performance. It is important, though, to bear in mind that if it is found that Argentina was indeed more unequal than Australia, this by itself does not prove that the better economic performance of Australia was due to better institutions, since there could be another unknown more important underlying factor causing such differences. But, if the evidence points out to the contrary – that Australia had actually been more unequal than Argentina during the whole period -, or that there was no difference in inequality between the two countries, then the results will provide some evidence contrary to the institutional theory of higher Argentine initial inequality as the explanation as to why the Argentine economy suddenly stopped catching up to its Australian counterpart.

The main purpose of this chapter is to collect and review the available data on inequality for the late 19<sup>th</sup> century and the early 20<sup>th</sup> century with special attention to Argentina and Australia, although not ignoring the importance of collecting evidence for other possible bench marks, such as the world average inequality. In this chapter many measures of inequality will be reviewed, but such an analysis can be broken down into the following sections: Section 3.1 focuses primarily on Gini-based and other more conventional measures of inequality of Argentina, Australia and even the world; section 3.2 will discuss how different levels of standards of living can affect income distribution and the concept of extraction ratios will be discussed; section 3.3 will present and discuss a way of measuring inequality through

production factor price convergence; and finally, section 3.4 will compile the findings for Argentina and Australia of the previous sections and will make an analysis of what can be observed from the evidence available.

### **3.1 Inequality at the Turn of the 20<sup>th</sup> Century**

The first issue when dealing with inequality in the 19<sup>th</sup> century and early 20<sup>th</sup> century is the overall lack of definite data on the topic. So while nowadays inequality can be – and usually is – measured and compared by widely accepted and calculated Gini indexes, there is no single measure of inequality for the turn of the 20<sup>th</sup> century that can be widely used. This means that making direct comparisons of inequality between any two countries in that period can be particularly tricky, but this does not mean that it should not be attempted.

Due to the previously mentioned claims that Argentina's high inequality would be the reason why it fell behind in its economic growth when compared to other countries, the topic of inequality in Argentina has received quite a bit of attention by researchers. But even with the attention received, the lack of easily available and reliable data has shown to be an important limiting factor. Not to mention that the inequality levels of Argentina, when calculated are often compared to Western European nations, and not necessarily with Australia. The debate of inequality in Australia in the same period, on the other hand, is not as discussed as the Argentine case, so there is not as much work done and evidence collected to be compared to the evidence from Argentina. Knowing that there is no single measure of inequality that can be used in an unquestionable fashion to compare the Australian case to the Argentine, the best alternative is to turn to as many sources as possible and compare as many of them as it can be compared.

A good first step comes from Bourguignon & Morrisson (2002), who analyze the overall inequality levels of the world throughout most of the 19<sup>th</sup> century and the 20<sup>th</sup> century. In order to do so, they make use of social tables collected from many countries and from them they try to divide the income of that society into 11 different income levels: the nine bottom deciles of income distribution and the two top 5% income holders. With the assumption that all members of any given quantile share the same income, they then pool this data from several countries together and are capable of estimating a Gini coefficient for the world or of any group of countries. By doing so, the authors manage to calculate a Lorenz curve with several points ( $11n$  points, in which  $n$  is the number of countries pooled together). This, unfortunately has the drawback that the researcher is left with either the choice of comparing Gini indices with only 11 observation points in them (and therefore not represent a detailed description of the income distribution of the country) or choose to pool a group of countries together and obtain a more descriptive Lorenz curve at the cost of not being able to make direct comparisons between any two countries. The authors of that paper have chosen the second alternative.

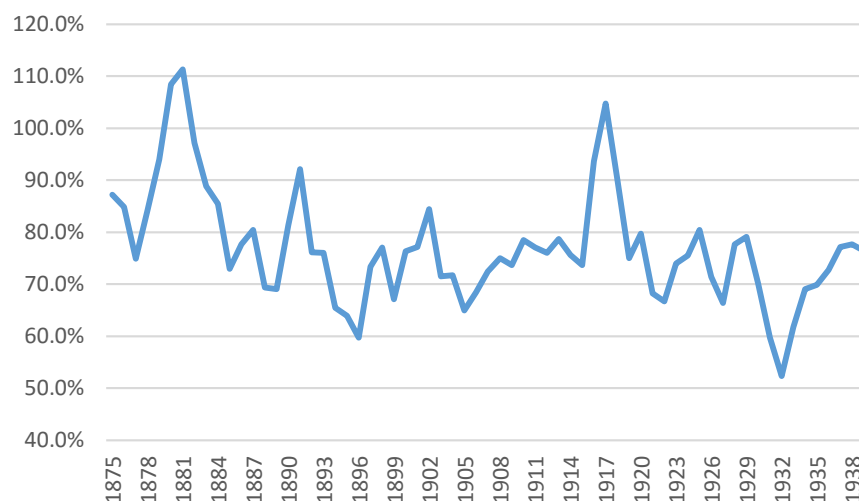
The way that Bourguignon and Morrisson calculated the overall world inequality was by grouping up several countries together in certain groups or regions, calculating the income distribution within each group, account for their population, and then group up all these sub-groups together and then calculate the world inequality. By doing so and using Theil indexes, they were able to breakdown the changes in inequality into changes in inequality between groups of countries, within groups of countries and to changes in population (for instance, if a lot of people migrate from one poor and more equal part of the

world to richer and more unequal countries, causing greater overall inequality, this would be captured and accounted for).

The problem for the current study is that Bourguignon and Morrisson's paper cannot show a proper distinction of inequality between Argentina and Australia in particular. Not only that, in their study Argentina and Australia are grouped up together with Western European nations, Canada and United States in a single group labeled as "Europe and European Settlement", even though there are reasons to believe that Western European countries and settlers economies actually had very different inequality patterns. As it is pointed out by O'Rourke, Taylor & Williamson (1996) (and as it will be discussed in greater detail later on), at the turn of the 20<sup>th</sup> century there is a strong convergence of production factor prices (rents of lands and wages) as a result of the first great globalization period (late 19<sup>th</sup> century until the first World War), but this event hits Western European nations in a very different fashion than it hits settler economies such as Argentina, Australia, New Zealand, United States and Canada: the first group became more egalitarian societies, while the second experienced greater inequality pressures. Not to mention that during that period Western Europe had experienced massive emigration, while the previously mentioned settler economies received those emigrants and experienced a large population growth. Bourguignon and Morrisson even notice that in their paper they were not able to pick up any major changes in inequality caused by changes in population between sub-groups, mainly because they had grouped up those settler economies with Western European nations, and in the process missing the opportunity to capture the changes in world inequality caused by one of the most important migration flows of the period.

The study also has shortcomings when looking specifically into the Argentine case, simply because the lack of data has forced the researchers to combine the social tables of Argentina and Chile together and count both countries as a single country. They justify this decision by claiming that both Argentina and Chile had similar incomes and inequality levels. Although it is true that Chile had somewhat comparable income levels to Argentina in the period ranging from 1875 to 1939 (ranging mainly in between 70 to 80% of Argentina's GDP per capita), the authors do not give any evidence that the two countries are so comparable that they can both be grouped up together (see Figure 2). Although this would not ultimately change the final result of their paper, this does mean that it is not possible to extract from it any particularly important evidence for the Argentine case.

Figure 2- Chile's GDP per Capita to Argentina's (%)



Source: Maddison Project data

Besides the points raised above, van Zanden et al. (2014) also point out that Bourguignon and Morrisson, due to lack of data, estimate the inequality in certain countries during the 19<sup>th</sup> century by assuming that its within-country inequality levels were the same as the ones observed in the earliest available estimate. This is particularly damaging for the results if we consider the findings of O'Rourke, Taylor & Williamson (1996), which indicate that between 1870 and 1914, as revealed by the factor price convergence caused by globalization, there were great changes in income inequality within-countries in many countries, in particular in settler economies such as Argentina and Australia. So assuming that within-countries had remained the same for several countries would go against the evidence that the profile of income distribution has changed dramatically between the 19<sup>th</sup> and the 20<sup>th</sup> centuries.

In an attempt to provide a better alternative to the results of Bourguignon and Morrisson, van Zanden et al. (2014) make another similar estimation of world inequality, but this time without the assumption mentioned in the previous paragraph. In order to counter the lack of data for several countries before the 1950's, what is done in that paper is to collect data either on low-skill wages divided by average income levels or on the distribution of the population's height and, given that those variables seem to be correlated to the inequality levels of a country, they are used to estimate the changes in income distribution for the countries in which actual income distribution data is not available. In addition, the authors propose the use of another income data series weighted by 2005 values, but they also make estimations using the Maddison Project data and find very little difference in results between the two income series and, as a result of that, all the results from their paper reported on this paper will be the ones based on the Maddison project data since it gives similar results that are more comparable with other papers.

After adding those changes in their estimations, van Zanden et al. (2014) find very similar Gini values to the ones from Bourguignon & Morrisson (2002) for 1950 onwards, but before this period (except for the year 1929 in which van Zanden's et al world is a bit more unequal) their results show a world with

greater overall equality levels than the ones displayed in the previous work (see Table 1). Contrary to the previous study, Argentina and Australia are not grouped up with Western European countries and are instead part of the groups of Latin America and North America plus Australia, respectively; although it is still a missed opportunity to have grouped them together exclusively with other settler economies.

Table 1 - Gini Coefficients of Income Inequality

	<b>Bourguignon &amp; Morrisson</b>	<b>van Zanden et al.</b>		
	<b>World</b>	<b>World</b>	<b>Latin America</b>	<b>North America and Australia</b>
<b>1820</b>	0.500	0.493	0.457	0.568
<b>1850</b>	0.532	0.461	0.390	0.428
<b>1870</b>	0.560	0.550	0.515	0.511
<b>1890</b>	0.588	0.517	0.453	0.455
<b>1910</b>	0.610	0.579	0.552	0.501
<b>1929</b>	0.616	0.630	0.596	0.530
<b>1950</b>	0.640	0.645	0.508	0.393
<b>1960</b>	0.635	0.641	0.580	0.377
<b>1970</b>	0.650	0.652	0.570	0.356
<b>1980</b>	0.657	0.652	0.543	0.387

Source: Bourguignon and Morrisson (2002), table 1. Van Zanden et al (2014), table 10.

But besides that, the two studies also reach some slightly different conclusions. While most studies point to Latin America as being the most unequal region in the world (Bourguignon and Morrisson's paper included), van Zanden et al. (2014) point to Sub-Saharan Africa as the most unequal region. This results would be explained by the fact that the African region presents higher between-countries inequalities than Latin America, where there is less of a dispersion of income levels. Another important distinction from the two studies comes from the estimation and breakdown of world Theil indices: while for Bourguignon & Morrisson (2002) the between-country inequality only becomes the main factor of total world inequality, van Zanden et al. (2014) find that between-country inequality becomes larger than within-country inequality already at second half of the 19<sup>th</sup> century (see Table 2).

Table 2 - Theil Coefficients of Within-Country and Between-Country Inequality

	Bourguignon & Morrisson			van Zanden et al.		
	Inequality within countries	Inequality between countries	Total	Inequality within countries	Inequality between countries	Total
<b>1820</b>	0.46	0.06	0.52	0.26	0.06	0.31
<b>1850</b>	0.47	0.13	0.60	0.24	0.12	0.35
<b>1870</b>	0.48	0.19	0.67	0.26	0.20	0.46
<b>1890</b>	0.50	0.25	0.75	0.23	0.27	0.50
<b>1910</b>	0.50	0.30	0.80	0.25	0.33	0.58
<b>1929</b>	0.41	0.37	0.78	0.26	0.41	0.67
<b>1950</b>	0.32	0.48	0.81	0.24	0.53	0.76
<b>1960</b>	0.32	0.46	0.78	0.23	0.50	0.74
<b>1970</b>	0.32	0.49	0.81	0.23	0.55	0.78
<b>1980</b>	0.33	0.50	0.83	0.23	0.54	0.77

Source: Bourguignon & Morrisson (2002), table 2. Van Zanden et al. (2014), table 4.

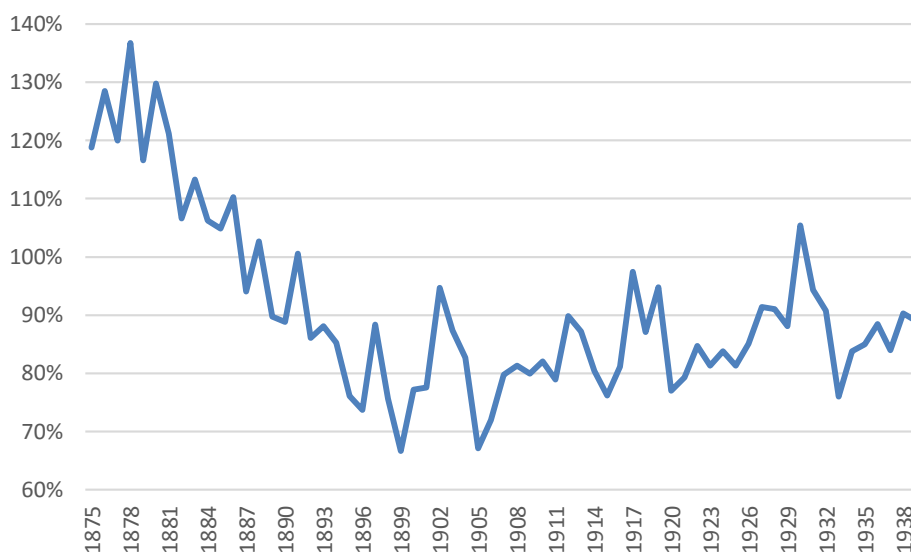
Although both these studies focus on the world inequality levels, they cannot shed light into the Argentine and Australian case directly. But they are of great importance to the current study in the sense that they can provide a benchmark of comparison between any results that might be obtained for Argentina and Australia.

After taking a closer look on the overall world inequality and its trends during the late 19<sup>th</sup> century and early 20<sup>th</sup> century, it is time to narrow down the analysis closer to the countries of interest themselves. The first evidence to review comes from a study on the topic of inequality, although this one more centered around the Southern Cone in Latin America. Bértola et al. (2009) try to estimate inequality levels of Brazil, Chile, Uruguay and Argentina for the years of 1870 and 1920 (the year just at the beginning of the Great Globalization and after the first World War). Using a variety of different available data sources, such as census data from each country and occasional social tables, the authors were able to estimate Gini indices for those countries. It is also important to bear in mind that quite a few assumptions were used to estimate the income distribution of Argentina and Uruguay, in particular.

Since the interest of this paper is on Argentina, it is important to pay particular attention to how the figure for Argentina was built, and then decide on how much those figures can be relied as a good indicator of inequality. As it is explained in the paper, the lack of data available for Argentina forces the authors to make a few assumptions, in particular it is explained that inequality data for 1920 was not found for any particular Argentine province, and the GDP per capita of just some provinces were found. So assuming that the in province inequality levels in Argentina were equivalent to the inequality level of Uruguay in the same year, the total Argentine Gini was the result of combined between-provinces differences in income (for the provinces to which such information was found) with the Uruguayan total inequality as the inequality of each individual Argentine province. This not only assumes that the inequality levels of Argentine provinces were the same for all provinces, but also assumes that Uruguay had similar inequality to Argentina's. The second assumption is not completely out of order, given that

both were settler economies with high number of migrants, with similar income levels (although Uruguay starts off with a much higher income and eventually settles down around 80% of Argentina's income) and that had similar economies based on the exports of meat and raising cattle; but no further argument is made for considering the two countries comparable on this particular metric (see Figure 3).

Figure 3- Uruguay's GDP per Capita to Argentina's (%)



Source: Maddison Project data

Yet another important assumption that was made and that can cast doubt on the results achieved is that the within-province inequality of Argentina (as well as for Uruguay) in 1870 was assumed to be of a value that would yield the same extraction ratio as the one from 1920, while actual income levels were used for a few provinces for which data was available. The extraction ratio is the one discussed by Milanovic (2009) and it will be discussed in further detail later on this paper, but at the moment the issue is that the assumption used to calculate inequality is to a great extent fixing the changes in inequality when evidence from O'Rourke, Taylor & Williamson (1996) that Argentina (and most likely Uruguay, although the country is not included in their study) experienced great changes in income distribution between the 1870 and 1920. This means that the Argentine figures calculated by Bértola et al. (2009) have to be taken with a grain of salt, since they fail to capture differences in GDP per capita within provinces, and most likely do not appropriately describe the actual levels of income concentration in Argentina, especially for the year of 1870. The data for Brazil and Chile on the other hand were mainly obtained from national censuses and other sources with direct information and, even though some assumptions had to be made to compensate for eventual lack of data, these figures are far more complete. On the table below it can be seen the results obtained from Bértola et al. (2009).

Table 3 - Gini According to Bértola et al. (2009)

	<b>Argentina</b>	<b>Brazil</b>	<b>Chile</b>	<b>Uruguay</b>
<b>1870</b>	0.522	0.392	0.594	0.481
<b>1920</b>	0.574	0.597	0.641	0.562

Source: Bértola et al. (2009), Table 4.

When analyzing the resulting figures displayed on Table 3, the first thing to notice is the sharp increase in inequality levels in Brazil and Chile, and even Uruguay has shown a significant increase in income concentration. Argentina, on the other hand, has experienced an increase in inequality, but not as sharp as the other countries, possibly due to the limitations and assumptions imposed on the calculation of these figures, since the other three countries (Uruguay not as much, but it, like Argentina - but not as much as Argentina – could not rely on as much direct data) did experience the expected increase of inequality levels.

Not only that, but when comparing the Argentine figures from Table 3 to the data displayed on Table 1, it can be noticed that Bértola’s et al figures do not seem to show any relatively high figures for Argentina: for both the Bourguignon and Morrisson and van Zanden et al. world figures are higher than the Argentine value from Bértola et al. (although there is no direct comparison for the year 1920, the figures for both the year of 1910 and 1929 are higher than the value from Bértola et al. for 1920). Not only that, but the values for Latin America estimated by van Zanden et al. (2014) are still very similar to the inequality observed in Argentina. So, despite the limitations on the Argentine data, there seems to be no sign of abnormally high inequality levels in Argentina to explain why it would have fallen behind Australia or the rest of the world. But these are not particularly reliable results and much further investigation is needed.

Unfortunately, there are not many other studies that estimate with a relatively credible precision of Gini of Argentina for the period at hand and very little on Australian inequality has been found. This is indicative of an underlying issue whenever inequality within countries are discussed for the period of the late 19<sup>th</sup> century and early 20<sup>th</sup>: there is very little data on the subject. This point is made by Williamson (2009) as he estimates Gini coefficients for Latin America. The main argument made in that paper is that the little evidence found on Latin America does not seem to support the argument that the continent had always been extremely unequal when compared to rest of the world. It is important to note, though, that the countries selected to represent Latin America in this paper are Brazil, Chile, Peru and Nueva España (with greater attention given to Mexico); but Argentina is not included in the analysis.

### **3.2 The Issue of Extraction Ratio**

Williamson (2009) finds little evidence that the countries that he analyzed had always shown higher inequality levels than their European counterparts or the rest of the world. He also points out to the fact that Gini coefficients alone might not be a good indicator of inequality, and refers to the concept found in Milanovic (2009) of extraction ratios. The idea of extraction ratios is that wealthier economies are more tolerant (or resistant) to concentration of income, simply because it takes a higher concentration



of income to cause a portion of the population to have incomes below the subsistence level. Or in other words: when an economy has fewer resources to share among its population, resources need to be better distributed to assure that everyone in that economy has enough.

This simple idea raises the possibility that an economy with lower Gini coefficients might actually suffer more from inequality than a richer economy with a higher Gini. With this in mind, Williamson (2009) makes the case that when discussing inequality levels the extraction ratios have to be taken into account. Particularly for the case of Latin America (Brazil, Chile, Peru and Mexico) there are no signs of actually higher inequality than the ones observed in Western Europe (the successful economies that, according to institutional theory, were capable to create good institutions and develop economically) or the rest of the world before the first World War. But due to the lower income levels of Latin America, at the observed Gini coefficients, those economies actually showed higher extraction ratios than Western Europe. This pattern is not only exclusive to Latin America either. In a study of the different economic paths of South and North Vietnam, contrary to previous research, it is found evidence that living conditions and income distribution were actually better in the South than in the North during colonial times (Lopez Jerez, 2014). This conclusion is reached by the author by pointing out that, despite the higher concentration of land in the Southern part of Vietnam, the standards of living in the North were lower than the ones from the South. When considering the differences of income between the two regions, it became evident that the South actually had lower extraction ratios than the ones observed in North.

The extraction ratio of any given country in a given period of time is calculated by seeing how close the Gini coefficient of that country is to the Inequality Possibility Frontier (referred henceforth as IPF). The IPF represents the maximum Gini coefficient that a country can reach without forcing a part of its population to live with an income level below the subsistence level. The extraction ratio shows the actual Gini as a percentage of the IPF, therefore showing how close the inequality level of a country is to pushing people under the subsistence level. In its turn, the IPF can be calculated by using the following equation (Milanovic, 2009):

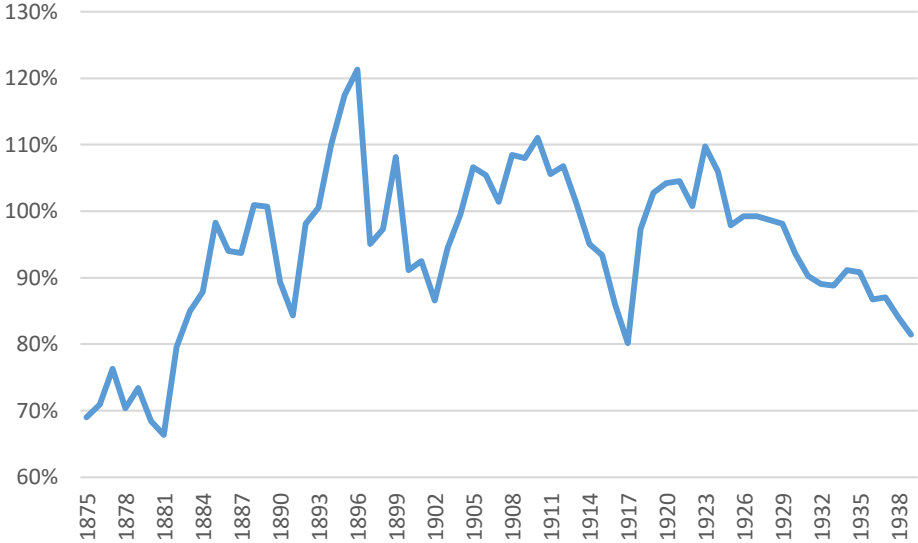
$$IPF(\rho) = \frac{\rho - 1}{\rho} (1 - \varepsilon)$$

Where  $IPF(\rho)$  is the value of IPF as a function of  $\rho$ , which is the average income of the country in terms of its subsistence level (GDP per capita divided by the subsistence level). The variable  $\varepsilon$  represents the share the total population that is part of the economic elite. It is common in studies that calculate extraction ratios to assume  $\varepsilon = 0.1$ , and this will be the same assumption used on this paper whenever the IPF is calculated. The subsistence levels of income need to be assumed as well, and in many studies there are two different values that are used: either \$ 400 Geary-Khamis 1990 dollars or \$ 300 Geary-Khamis 1990 dollars. Since there is no evident predilection for either one of the two values in studies using the IPF, the current paper will not choose for either one or the other and will, when relevant, display results for both assumptions.

On the topic of inequality levels, considering the extraction ratios of one country is a critical point to bear in mind. And the argument made by Williamson (2009) that Latin America had lower total levels

of inequality, but higher extraction ratios, certainly makes good use of the concept of extraction ratios. But these results for Latin America are not directly extendable to Argentina. Besides the obvious point that the inequality of Argentina was not covered by the study, it is also worth noting that Argentina actually had a very high income level compared not only to Latin America, but also Western Europe. As it can be seen from the Figure 4, Argentina’s GDP per capita from the mid-1890s until the beginning of the 1930s varied mainly between 90 to 110% of income levels observed in Western Europe. This means that there is very little room for arguments that state that Argentine inequality was lower than the one observed in Western Europe, but that its extraction ratios were higher.

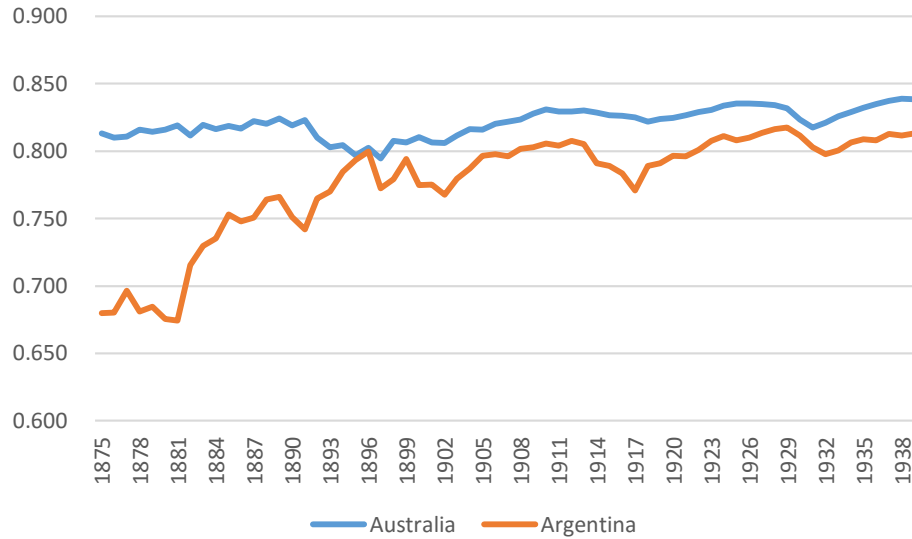
Figure 4 - Argentina's GDP per Capita as a Percentage of Western Europe's GDP per Capita



Source: Maddison Project Data

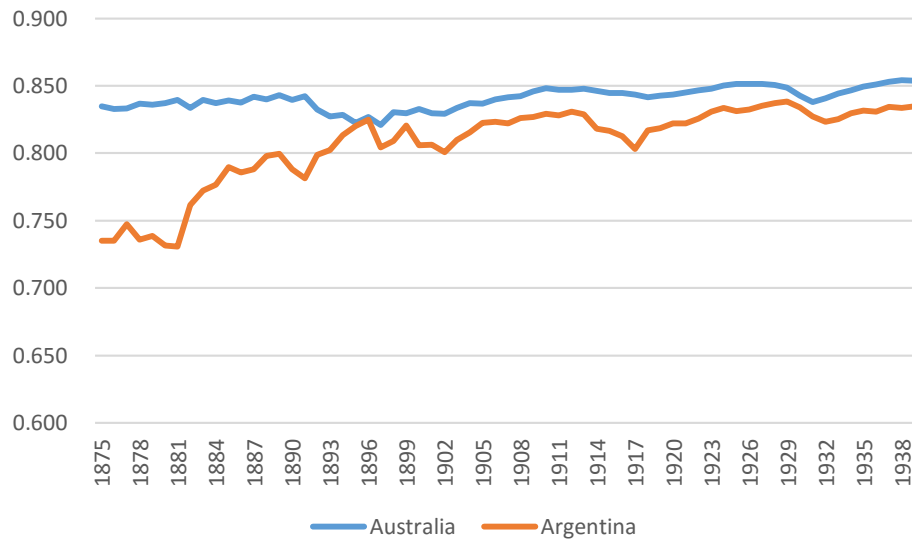
But this study has a bigger focus on the comparison of inequality of income between Argentina and Australia; and to check the reliability of the data available, to study it and see what conclusions that are possible to extract from it. With this in mind and as seen before, Australia and Argentina actually share a quite similar income level for most of the period being analyzed. So being this the case, it is worth calculating the IPF of both countries and comparing them to check if there really is enough room for the argument that Argentina can have a lower inequality level than Australia, but still show a significantly larger extraction ratio. In the Tables 5 and 6 below are displayed the IPF levels of Australia and Argentina for the subsistence levels of US\$ 400 and US\$ 300, respectively.

Figure 5 - Inequality Possibility Frontier (US\$ 400 as Subsistence Level)



Source: Own estimations using Maddison Project data (2016).

Figure 6 - Inequality Possibility Frontier (US\$ 300 as Subsistence Level)



Source: Own estimations using Maddison Project data (2016).

Both of the graphs above describe a similar story: although the Argentine IPF has never been higher than Australia's (an expected result, given that the former was never richer than the latter), the IPF of Argentina and Australia are actually quite similar to each other from the mid-1890s onwards for both values of subsistence level. But there is a gap between them before the 1890s, indicating that there would be some room for different extraction ratios for an equal Gini coefficient for both countries. This is particularly accentuated when using \$400 as the level of subsistence. This means that after the mid-1890s,

Argentina can be, with a good degree of confidence, considered more unequal than Australia if an index built on reliable data indicate that. But before the 1890s, even if an index of inequality points to higher income concentration in Argentina, there is still the possibility that the lower Argentine income may actually result in higher extraction ratios in Argentina than in Australia.

Although meant to be used as direct comparison with Gini coefficients, IPFs can provide some insight when comparing inequality measures other than Gini coefficients, since the underlying concept that richer economies can afford higher inequality levels still applies and that IPFs can give an idea of how much more inequality a richer economy can afford compared to a less fortunate one. So the point raised on the previous paragraph is an important one to bear in mind even if the index being compared is not a Gini coefficient. This is particularly important to consider in the next few sections, where an indicator of inequality built on factor prices will be used.

Another interesting observation to be made is that the higher income levels of both Argentina and Australia when compared to the average Latin American and world average income, mean that the two countries being analyzed can actually afford to have higher inequality levels than the Latin American and world average, and still have a lower extraction ratio. This means that having higher than average inequality levels may not be an enough condition to explain the failure in long-term economic development or success in it (in the case of having lower inequality). It would instead be far more interesting to compare inequality between the two countries: both have similar income levels and it is argued that differences in income distribution explain their diverging development, so a direct comparison could provide some evidence as to what or not differences in inequality can indeed explain differences in economic development.

The main thing that can be taken from this section is that there is no abundantly clear Gini-based evidence that Argentina was significantly more unequal than other settler economies to the point of explaining why it failed to keep up its economic development. Much less evidence can be found to make the direct comparison with Australia or even to make a comparison of Australia with any other country. The issue is that it will be necessary to use some other different measurement to compare Argentina and Australia, and when doing so it will be important to consider that an indication of higher income concentration in Argentina before the 1890s may not necessarily indicate a higher extraction ratio than in Australia. But an indication of higher income concentration in Argentina when compared to Australia after the 1890s can almost certainly be considered evidence of actually higher extraction ratios. And as is shown by Milanovic (2009), bearing in mind the concept of extraction ratio is of crucial importance due to the fact that it can reveal how much an economy suffers from inequality.

### **3.3 Factor Price Convergence**

In O'Rourke, Taylor & Williamson (1996) a different approach is used. With the main purpose of measuring factor price convergence as the outcome of the globalization process of the late 19<sup>th</sup> century and early 20<sup>th</sup> century, the authors do make the point that this process has actually resulted in big changes in income distribution in different countries. The great reduction in transportation costs during the second half of the 19<sup>th</sup> century had revolutionary impact on world trade and migration giving start to a great process of globalization (Findlay & O'Rourke, 2007). This meant that more goods were traded

internationally, and as predicted by the Heckscher-Ohlin model of trade, factor prices will have the tendency to converge, since the importation of goods that are production intensive of a certain factor has a similar impact of actually bringing in to the country some of that production factor and use it domestically, reducing its price in the importing country. Considering that countries have a larger propensity to import goods that require intensive use of production factors that are scarce (expensive) in the importing country, the expected result is that the scarce production factor will become cheaper, while the abundant factor experiences the opposite (countries export goods for which its production factor is abundant, therefore having a similar impact of exporting that factor) and gets more expensive. Or in other words, production factor prices will converge. On this particular case, the reduction of transport costs has also brought with it mass migrations, literally transporting labor from one country to another in large numbers and affecting very directly wages (the factor price of labor).

To make their point, O'Rourke, Taylor & Williamson (1996) make use of the data on unskilled wages and the rents on lands for several countries and then they compare the shifts in the wages-to-rents ratios in each country and find evidence that the countries that were more open to trade and migration were the ones that experienced the largest changes to those ratios in the period ranging from 1870 until 1914. This comes to show that the greater world trade of the period did indeed result in greater price convergence and is a sign of greater globalization that was felt more by the countries that maintained lower tariffs and more open migration policies.

But that study also showed that countries responded very differently depending of their factor endowments at the beginning of the period. While Western European generally were more labor abundant and land scarce at the beginning of the period, settler economies (such as Argentina and Australia) were labor scarce and land abundant. This means that the convergence factor resulted in inverse movements for the two groups of countries: land intensive goods flowed from settler economies to Western Europe and labor intensive goods and migrants flowed from Western Europe to the settler economies. As a result of this Western Europe experienced a sharp increase in wages and a decrease in rents, while settler economies saw their wages go down and their rents go up.

As is observed by Williamson (1998), the wage-rent ratio can actually dub as an interesting proxy of income inequality for pre-industrial societies. In such societies, the rural land owners would be at the top of the income distribution, while low-skill wage earners would be at the bottom; so a ratio that included both values could work as a comparison of income between the richest portions of society with its poorest. This is not by any measure a perfect measure of inequality, since it does not capture any changes in other segments of society, such as skilled laborers and capital holders, but it is still capable to cast some light on the issue of inequality.

As it has been mentioned before, O'Rourke, Taylor & Williamson (1996) show on their paper that many countries experienced big shifts in their wage-rent ratios and that settler economies in particular experienced a sharp drop of their ratio, meaning that they experienced an increase in inequality. Although it is better visualized in Williamson (2002), Australia and Argentina both experience this process, although the drop of the wage-rent ratio of Argentina was much larger than the Australian drop, indicating that inequality rose more sharply in Argentina than in Australia (see table UU). It is also possible to notice that the drop of the wage-rent ratio took place in a very short period of time (up until 1914) and after the first World War the ratio stabilized, something that almost all countries in O'Rourke, Taylor & Williamson's (1996) analysis experienced. This sudden world-wide stabilization of the wage-rent ratio is indicative that

the stabilization of those ratios for the Argentine and Australian case (with a brief and light increase for Australia) was not caused by a phenomenon exclusive to these two economies, but that, instead it was caused by a global event. The timing and the fact that the factor price convergence seems to stop simultaneously for all countries makes it evident that the first World War and its deterrence of world trade and migration movements were behind the sudden stop of factor price convergence and increase in inequality in Argentina and Australia.

In Table 4 below (followed by Figure 7) are the figures for the wage-rent ratio for Argentina and Australia in index numbers for which the value for the year of 1911 correspond to 100 for each country:

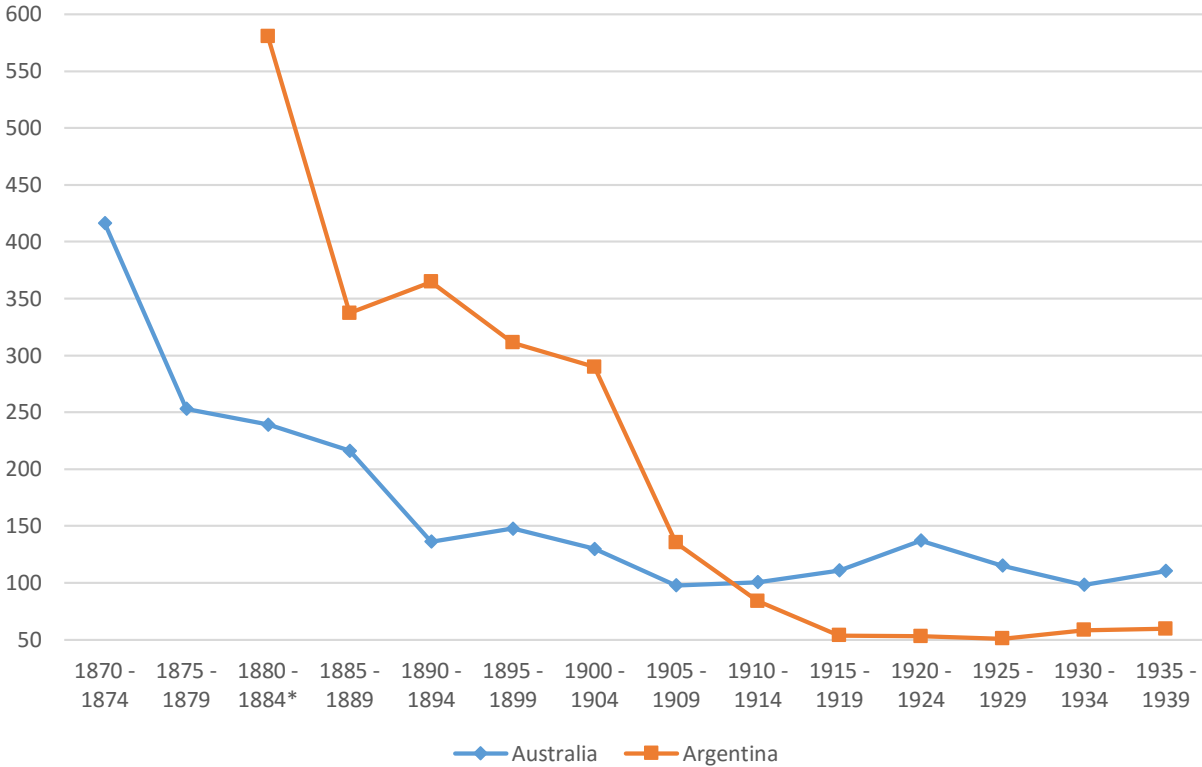
*Table 4 - Wage-Rent Ratio (1911 = 100)*

	<b>Argentina</b>	<b>Australia</b>
<b>1870 - 1874</b>		416.2
<b>1875 - 1879</b>		253.0
<b>1880 - 1884</b>	580.4*	239.1
<b>1885 - 1889</b>	337.1	216.3
<b>1890 - 1894</b>	364.7	136.2
<b>1895 - 1899</b>	311.1	147.7
<b>1900 - 1904</b>	289.8	130.0
<b>1905 - 1909</b>	135.2	97.9
<b>1910 - 1914</b>	84.0	100.6
<b>1915 - 1919</b>	53.6	111.0
<b>1920 - 1924</b>	53.1	137.2
<b>1925 - 1929</b>	51.0	115.1
<b>1930 - 1934</b>	58.4	98.3
<b>1935 - 1939</b>	59.5	110.5

Source: Willaimson (2002), Table 3 and 4.

\* actually only for the years of 1883-84 for Argentina.

Figure 7 - Wage-Rent Ratio, 1870-1939 - (1911 = 100)



Source: Williamson (2002), Table 3 and 4

This data really does bring an interesting perspective on the issue being studied: it seems that the Argentine economy had more difficulties to restrain the increase of inequality than the Australian economy did. But before looking into what factors could have played a role on the intensity of the changes in inequality, it is important to recognize that the data at hand does not allow to make direct absolute comparisons. Or in other words, although it is evident that Argentina experienced a greater increase in inequality than Australia, it is still not possible to tell which country was the most unequal. It could very well be the case that Argentina had a higher initial inequality and experienced an even greater increase in income concentration than Australia. But it could also be the case that Argentina started off with an overall lower inequality level than Australia and only after the first World War it became more unequal than their Australian counterparts. Or it could even be the case that, despite the bigger jump in income concentration, Argentina remained a more egalitarian country than Australia.

The last case in particular would mean that the Argentine divergence with Australia cannot be explained by bad institutions risen from inequality; there could be another mechanism behind the creation of such institutions. And the second scenario would raise the question as to why Argentina failed to resist the pressure for more unequal distribution than Australia did, and whether or not there were any underlying factors behind it. Meanwhile, evidence that the first scenario is indeed the correct one would strengthen the institutional argument that Argentina (like other Latin American countries) had always

been more unequal (at least more than Australia) and their failure to keep on the path of long-term economic growth is due to underlying income distribution differences.

### 3.4 The Inequality Levels of Argentina and Australia

So from the previous section it can be seen how important it is for this discussion to assess the income distribution of Australia and Argentina in a direct manner. The two countries may not be exactly identical to one another, but they still share a lot of similarities, which, to a certain extent, controls many variables that could explain their divergent economic path. And even though differences in inequality may not fully explain the divergence of those countries, it may play an important role. So in this section, by using other sources that also use the data from Williamson (2002), it will be attempted to construct a way of comparing the wage-rent ratio of Argentina and Australia in a direct way and actually make it possible to tell which one had a higher such ratio and, therefore, higher inequality.

In Williamson (1995) a large data set of real low-skilled wages is built for a variety of different countries for the period ranging from 1830 until 1988. The nominal wages are obtained from a variety of different sources with different sources for each country and then the cost of living is estimated for each country and with both these values at hand the real wage is calculated. The wages for Argentina, especially for the 19<sup>th</sup> century and early 20<sup>th</sup> century refers mainly to the wages of *porteros* and *peones* (janitors and construction workers) of Buenos Aires and dates back to 1864. Although it could be criticized that Buenos Aires was the wealthiest part of Argentina and would not represent the bottom of the income inequality within the country, it is worth pointing out that most of the Argentine population was concentrated in Buenos Aires: by 1895 just over 45% of the Argentine population was located in the capital city and in the Buenos Aires province. So even if those professions would earn less in another province, they are still representative for a large portion of the Argentine population. The Australian wages are pulled from sources that cover a more diverse pool of occupations and dates as far back as 1854.

The data collected by Williamson (1995) is reported in the appendix of its paper in the form of index numbers for which 100 is the value of country's wage compared to the wages of Great Britain in a specific year. In his paper, three different tables with wages are reported (tables A2.1, A2.2 and A2.3 in the appendix), each for a different period: the first one ranges from 1830 until 1913 and has the British wages of 1905 as its base of comparison, the second period goes from 1914 to 1945 and has the British wages of 1927 as its base of comparison, and the third period covers the period of 1946 until 1988 with 1975 British wages as taking the value of 100. This data allows to see trends of wages between Australia and Argentina in comparison with British wages, and since the British wages are being measured against itself, it is possible to tell whether or not real British wages are increasing or decreasing. For that reason, it is reported in the appendix of this paper the index numbers for real wages of Great Britain, Argentina and Australia (table AA1, AA2 and AA3).

The first thing to notice is that British real wages have consistently increased throughout the whole period without any noticeable and persistent drops of wage levels, meaning that the changes in Argentine and Australian wages reported on tables AA1, AA2 and AA3 can always be compared to an always rising benchmark. It is worth noting that it is not until after the second World War that Australian wages fall behind the British, while the Argentine wages are for the majority of the period lower than the



British, but it managed to surpass it on a few occasions: on a few years at the turn of the 20<sup>th</sup> century and during the 1930's up until the end of the second World War.

But comparing Australian wages to British wages and then compare Argentine wages to British wages in an attempt to compare the wages of the two settler economies is a burdensome process which makes it difficult to visualize the relationship of the two. So, as suggested by Williamson (1995) himself, dividing the index of real wages of one country by another can provide the ratio of the wages of the two countries. Or as it can be expressed in the equations below, where  $w_t^{arg}$  represents the real low-skill wage of Argentina in year  $t$ ,  $w_t^{aus}$  represents the real low-skill wage of Australia in year  $t$ , and that  $q$  is the year in which  $w_q^{GB} = 100$  (the wage of Great Britain in the base year).

$$\frac{w_t^{arg}}{w_q^{GB}} = x_t \quad \text{and} \quad \frac{w_t^{aus}}{w_q^{GB}} = y_t$$

Where  $x_t$  is the wages of Argentina in year  $t$  compared to British wages of the year  $q$  (the same goes for  $y_t$  and Australia). The values from  $x_t$  and  $y_t$  are actually shown in tables AA1, AA2 and AA3. This means that, for instance,  $x_{1895} = 79$  and that  $y_{1895} = 160$ . So by following the suggestion of Williamson, we get:

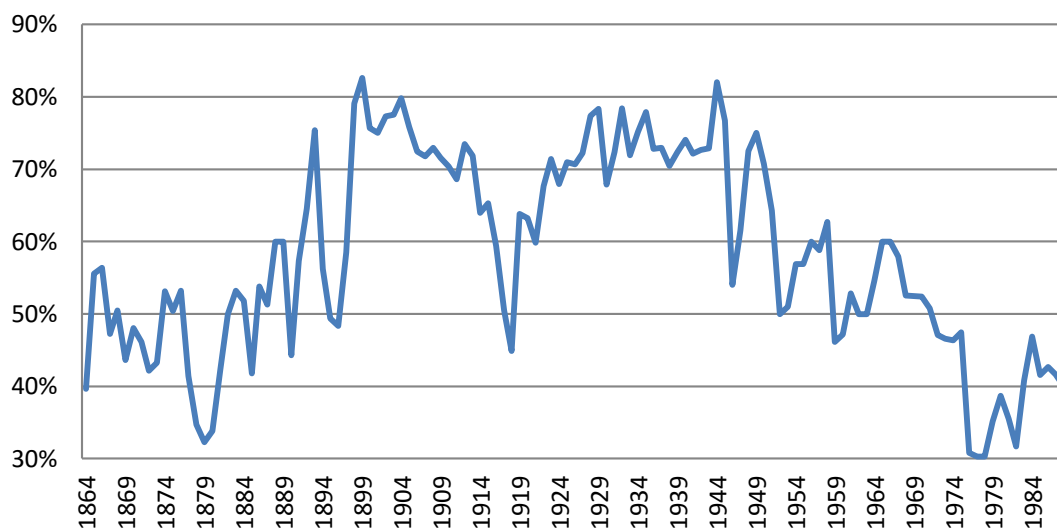
$$\frac{x_t}{y_t} = \frac{\frac{w_t^{arg}}{w_q^{GB}}}{\frac{w_t^{aus}}{w_q^{GB}}}$$

Which can also be expressed as:

$$\frac{x_t}{y_t} = \frac{w_t^{arg}}{w_t^{aus}} = \alpha_t$$

Let's call the ratio of Argentine wages to Australian wages  $\alpha$ , for simplifying future equations. One interesting thing about this result is that it does not matter what year of comparison is being used. This means that even though table AA1, AA2 and AA3 have different base years, it is still possible to make one continuous series of wage ratios throughout the period of 1864 (the first year in which there is available data for both countries) up until 1988. Such a series can be seen on Figure 8 below and there seems to be no sign of existing breaks caused by shifts in the use of data from one table to the other.

Figure 8 - Ratio of Argentine to Australian Low-Skill Real Wages (1864-1988)



Source: Williamson (1995), Tables A2.1, A2.2 and A2.3

Before proceeding in calculating a direct comparison of wage-rent ratios between Australia and Argentina, it is important to take a closer look at the results shown on Figure 8. The first obvious point to be made here is that Argentine wages were never higher than Australian wages, but for the very long period between 1899 up until after the second World War, wages (except for the period covering the first World War) have maintained relatively similar and constant values compared the Australian wages; something around 70 and 80% of Australian wages. But before that period, Argentine wages start off at very low levels compared to Australia, often representing less than half of its total value. But especially after 1880, Argentine wages start to catch up with Australian wages. Unfortunately for Argentina, from the 1950s and onwards a new trend of declining comparative wages seems to emerge and finally in 1975 there seems to be a sharp drop of wages that consolidates the downward trend beyond any doubts. After 1975, Argentine wages reach their lowest comparative values, often performing worse than during the 19<sup>th</sup> century.

Although it is not a perfect match, it is interesting to notice that, at least visually, the comparative values of wages seem to fit quite well with the trends described by Sanz-Villarroya (2005) for the GDP per capita of Argentina and Australia: an initial convergence period up until 1899 followed by a period of relatively constant comparative values followed by a quick divergence after 1975. Although that is something that can be noted, that is not enough to claim that there is an unquestionable relationship, although it is worth pointing that higher Argentine economic growth leading to higher growth of wages in Argentina are compatible trends.

As to what concerns to changes caused by the globalization Great Globalization of the 19<sup>th</sup> century up until the first World War, followed by a more closed interwar period and finally by a slow return to a more globalized world, it can be said that those forces were affecting both Argentine and Australian wages simultaneously. So unless one of the countries is more affected by such trends than the other, Figure 8 will not show any shifts in trend.

Now that the ratio of Argentine wages to Australian wages are known, by making use of the data on wage-rent ratios from Table 4 and the wage ratio of Argentina and Australia itself, it is possible to calculate the ratio of land rents between the two countries. Given that the data in Table 4 is grouped up in five-year periods, the wage ratios are average as well to match the periods. Since the data in Table 4 is the wage-rent ratio of one the countries as an index number in which the ratio equals 100 in a base year  $q$  (this time it is the year of 1911), it can be expressed mathematically as:

$$\frac{\frac{W_t^{arg}}{r_t^{arg}}}{\frac{W_q^{arg}}{r_q^{arg}}} = X_t \quad (1)$$

Where  $r_t^{arg}$  represents the land rent values of Argentina in period  $t$ , and  $X_t$  is the value found in Table 4, for instance,  $X_{1895-1899} = 337.1$ . Continuing with equation (1), we have the following:

$$r_t^{arg} = \frac{W_t^{arg}}{X_t} \frac{W_q^{arg}}{r_q^{arg}}$$

Similarly, for Australia it is possible to say that:

$$\frac{\frac{W_t^{aus}}{r_t^{aus}}}{\frac{W_q^{aus}}{r_q^{aus}}} = Y_t \quad (2)$$

Where the values of  $Y_t$  can be found on Table 4. For instance,  $Y_{1885-1889} = 216.3$ . Continuing to operate algebraically on equation (2) we reach a similar result to the one found for equation (1):

$$\frac{1}{r_t^{aus}} = Y_t \frac{r_q^{aus}}{W_q^{aus}} \frac{1}{W_t^{aus}}$$

Unfortunately, it is not possible from these equations obtain the absolute values of land rents for different years, since the values of rents and wages for the base period (when  $t = q$ ) and the wage values for each country are not available. But it is still possible to calculate the ratio of land rents of any given

year (rents of Argentina as a percentage of Australia's rents), or as it will be called for simplification on future calculations:  $\beta_t$ . Below we can express  $\beta_t$  as:

$$\beta_t = \frac{r_t^{arg}}{r_t^{aus}}$$

By substituting the values of  $r_t^{arg}$  and  $r_t^{aus}$  in the equation above, we get:

$$\beta_t = \left( \frac{w_t^{arg}}{X_t} \frac{w_q^{arg}}{r_q^{arg}} \right) \left( \frac{r_q^{aus}}{w_q^{aus}} \frac{Y_t}{w_t^{aus}} \right)$$

Which can be rearranged as:

$$\beta_t = \frac{Y_t}{X_t} \frac{w_t^{arg}}{w_t^{aus}} \frac{w_q^{arg}}{r_q^{arg}} \frac{r_q^{aus}}{w_q^{aus}} \quad (3)$$

It is impossible to solve equation (3) without knowing the values of the last two terms on the right of the equation:  $\frac{w_q^{arg}}{r_q^{arg}}$  and  $\frac{r_q^{aus}}{w_q^{aus}}$ . But from equation (1) we have that:

$$\frac{w_t^{arg}}{r_t^{arg}} = X_t \frac{w_q^{arg}}{r_q^{arg}}$$

Therefore:

$$\frac{w_q^{arg}}{r_q^{arg}} = \frac{w_t^{arg}}{r_t^{arg}} \frac{1}{X_t} \quad (4)$$

Similarly, we have from equation (2):

$$\left( \frac{w_t^{aus}}{r_t^{aus}} \right) \left( \frac{r_q^{aus}}{w_q^{aus}} \right) = Y_t$$

Which yields equation (5) as below:

$$\frac{r_q^{aus}}{w_q^{aus}} = Y_t \frac{r_t^{aus}}{w_t^{aus}} \quad (5)$$

Now by substituting equations (4) and (5) in equation (3) we have:

$$\beta_t = \frac{Y_t}{X_t} \frac{w_t^{arg}}{w_t^{aus}} \left( \frac{w_t^{arg}}{r_t^{arg}} \frac{1}{X_t} \right) \left( \frac{r_t^{aus}}{w_t^{aus}} Y_t \right)$$

Which can be rearranged as:

$$\beta_t = \frac{Y_t^2}{X_t^2} \frac{(w_t^{arg})^2}{(w_t^{aus})^2} \frac{r_t^{aus}}{r_t^{arg}}$$

Given that  $\beta_t = \frac{r_t^{arg}}{r_t^{aus}}$  and that  $\alpha_t = \frac{w_t^{arg}}{w_t^{aus}}$ , we have the following:

$$\left( \frac{r_t^{arg}}{r_t^{aus}} \right)^2 = \left( \frac{Y_t}{X_t} \alpha_t \right)^2$$

Which finally yields the ratio of land rents between Argentina and Australia as following the relationship shown below:

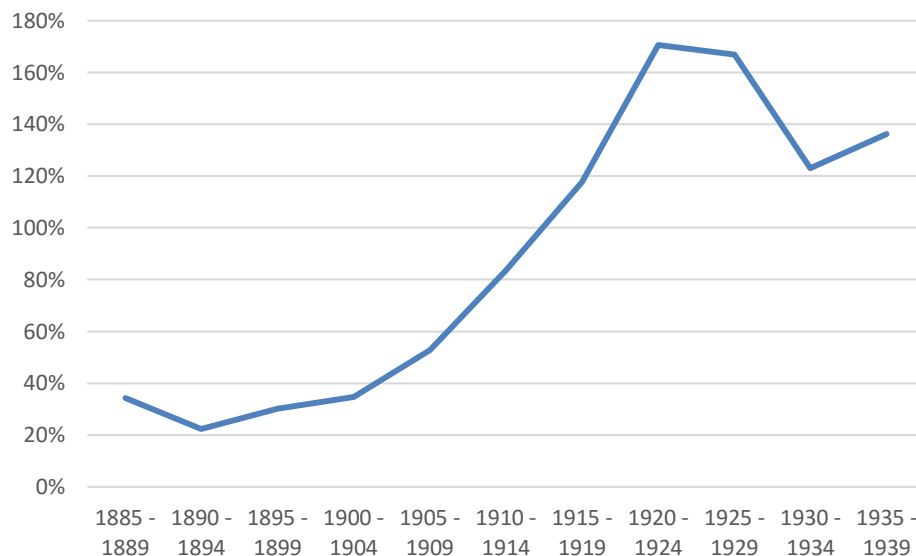
$$\beta_t = \frac{r_t^{arg}}{r_t^{aus}} = \alpha_t \frac{Y_t}{X_t}$$

The values of  $\beta_t$  are presented on Table 9 for the period that goes from 1885 to 1939, but it can be better visualized in the Figure 9 below. In the graph it is possible to notice that the rent levels of Argentina were significantly lower than the one from Australia in the beginning of the period analyzed but they increase very quickly from the 1890s onwards from only 22% of the value of Australian rents and

they do not stop growing comparatively to Australian rents until the 1920s, at which points it hits just over 170% of the value of Australian rents; it grew even during the first World War. Argentine land rents overtake the values for their Australian counterparts at some point between the first World War and the first half of the 1920s, after which period Argentine rents experience only a slight decrease and can be said to stabilize its value compared to Australia's.

The rapid growth of Argentine rents (compared to Australia) is not a mere movement of convergence between the two variables, since the Argentine value far overshoots the Australian values. Not only that, but it is important to notice that a good part of that relative growth took place either during the first World War and immediately after it, a period in which world trade had been greatly cut back by the war and a wide spread adoption of protectionist measures. This means that, although international trade could have played a role by affecting land rents more in Argentina than in Australia, it cannot fully explain the shifts shown on Graph 9, especially after 1915.

Figure 9 - Argentina's Land Rents as a Percentage of Australia's Land Rents



Source: Own estimations based on Williamson (2002).

Now that both the ratios of Argentine real wages to Australian wages and Argentine land rents to Australian land rents are known for each year ( $\alpha_t$  and  $\beta_t$ , respectively), it is possible to calculate the ratio of the Argentine wage-rent ratio to the Australian wage-rent ratio for any specific period, which we shall call  $\lambda_t$ . The point of making such a calculation is that if  $\lambda_t > 1$ , this will mean that the wage-rent ratio of Argentina is larger than the Australian ratio, indicating that it had a more egalitarian distribution of income (at least between low-skill wage earners and land owners). If, on the other hand, it shows that  $\lambda_t < 1$ , this would indicate the opposite: Australia would most likely be the more egalitarian economy.

Therefore,  $\lambda_t$  can be obtained by the following way:

$$\lambda_t = \frac{\frac{w_t^{arg}}{r_t^{arg}}}{\frac{w_t^{aus}}{r_t^{aus}}}$$

Which can easily be reorganized as:

$$\lambda_t = \frac{w_t^{arg}}{w_t^{aus}} \frac{r_t^{aus}}{r_t^{arg}}$$

Although the specific values of each variable on the equation may not be known, the values of  $\alpha_t$  and  $\beta_t$  are and can easily be introduced to the equation above. Meaning that  $\lambda_t$  can be expressed and calculated as:

$$\lambda_t = \frac{\alpha_t}{\beta_t}$$

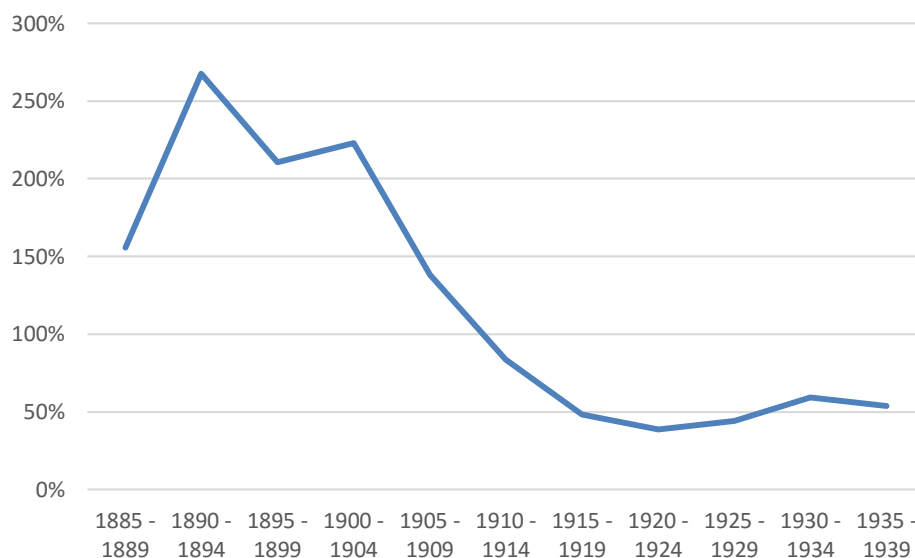
This means that the value of  $\lambda_t$  can be calculated and a direct comparison of Argentina's and Australia's inequality can be drawn using the data from Williamson (1995, 2002) for the period of 1885 until 1939, a period in which both economies experienced two very different trends: before the first World War both countries experienced sharp decreases in income concentration to an extremely globalized world economy open to trade and migration; but during the Great War and in the interwar period trade is put on hold and the world economy becomes a more closed environment, resulting in an stabilization in the changes in inequality in both Argentina and Australia. Table 5 shows the values of Argentina's wages as a share of Australia ( $\alpha_t$ ), Argentina's land rents as a share of Australia's ( $\beta_t$ ) and the ratio of the Argentine wage-rent ratios to Australia's wage-rent ratios ( $\lambda_t$ ) are shown for the period of 1885 until 1939. And Figure 10 displays the Argentine wage-rent ratio as a percentage of Australia's wage-rent ratios during the period of 1885 all the way down to 1939.

Table 5 - Argentina's Wages, Rents and Wage-Rent Ratios Compared to Australia

Period	Wages	Rents	Wage-Rent Ratios
<b>1885-89</b>	53.4%	34.2%	156%
<b>1890-94</b>	59.5%	22.2%	268%
<b>1895-99</b>	63.6%	30.2%	211%
<b>1900-04</b>	77.1%	34.6%	223%
<b>1905-09</b>	72.9%	52.8%	138%
<b>1910-14</b>	69.7%	83.4%	83%
<b>1915-19</b>	56.8%	117.6%	48%
<b>1920-24</b>	66.0%	170.6%	39%
<b>1925-29</b>	73.9%	166.9%	44%
<b>1930-34</b>	73.1%	123.1%	59%
<b>1935-39</b>	73.3%	136.1%	54%

Source: Own estimations based on Williamson (2002) and Williamson (1995)

Figure 10 - Argentina's Wage-Rent Ratio as a percentage of Australia's Wage-Rent Ratio



Source: Own estimations based on Williamson (1995 and 2002).

The figures from the last column of Table 5 can be interpreted as how many times an Argentine low-skill wage-earner earned more than an Australian low-skill wage-earner earned for every dollar earned by a land renter in their respective country. For instance, in the period of 1885-1889, the ratio of



wage-rent ratios is of 156%, which can be read as meaning that in this period Argentine wage-earners were being paid 1.56 times more than Australian wage-earners were paid for every dollar earned by a land holder. But besides this insight, the main point of this indicator, as mentioned before, is to check if its values are above or below the 100% mark. If that indicator is above 100%, this is an indication that the wage-rent ratios were higher in Argentina than in Australia, indicating that Australia had a more concentrated income. If the opposite is observed (indicator below the 100% mark), this would mean that Australia had a higher wage-rent ratio, which translates into higher income concentration in Argentina than in Australia. And this will be the aspect of the data on which this analysis will concentrate the most.

As it can be seen from Figure 10, the ratio of wage-rent ratios is above 100%, it increases slightly and from the 1890-1894 period it decreases all the way down to the start of the first World War and then remains relatively constant around the 50% mark. With the reasoning from the previous paragraph, it could be said that the story being told by Figure 10 is that Australia actually had higher inequality levels than Argentina at the beginning of the period and then from the period of 1890-1894 this trend started to revert: the difference in inequity levels started to reduce and at some point in the 1910-1914 period, Argentina actually became more unequal than Australia.

This comparison of wage-rent ratios by itself already show a very interesting result: it seems that Argentina has not always been more unequal than Australia (at least in absolute terms), the Latin American country would only become more unequal at the beginning of the 20<sup>th</sup> century, during the great globalization era described in O'Rourke, Taylor & Williamson (1996). This now raises the question: when studying the role of inequality and institutions in the diverging development paths of Argentina and Australia, what should be the most important factor? Absolute inequality? Or inequality relatively to the income level of the country (extraction ratios)? If it is said that absolute inequality measures are the main point, then the current analysis (assuming that the values used in the figures are a good proxy for inequality) seems to point to a very interesting result: The argument of (Sokoloff & Engerman, 2000) that Latin America (Argentina included) failed to rise to the ranks of developing countries due to its higher than average inequality is, ultimately, a flawed argument in light of these evidences.

If, on the other hand, it is argued that extraction ratios are better indicators than sheer inequality measures of the long-term economic development, the results from Figure 10 do not provide such a readily available answer. While absolute measures of inequality may be higher in one given country relative to another, differences in income between the two could lead to a different conclusion when considering each country's extraction ratio. In other words, it is possible that a certain indicator of inequality may point that country A is more egalitarian than country B, but the extraction ratios of the two countries show that country A actually has a worse distribution of income to its standard of living.

The same could still happen in the comparison of income distribution between Argentina and Australia. The wage-rent ratios being used in this paper as indicators of income distribution seem to point that before the 1910-1914 period there was greater income concentration in Australia than in Argentina. But, due to the lower standards of living in Argentina at that time, it is still possible that Argentina had a higher extraction ratio than Australia. Unfortunately, the indicator of inequality being used (wage-rent ratios) cannot be directly compared to the respective IPFs of each country. So there is no way of unambiguously compare the inequality levels obtained in this study to an IPF and obtain the extraction ratio of both economies to tell which one truly had the most harmful income distribution

It is also difficult to tell the real intensity of change of income distribution by the values of wage-rent ratios. It is impossible to estimate how much a change of 1% in the wage-rent ratio corresponds to a Gini coefficient, although the directions of changes are the same. The evidence that we have seem to indicate that the dramatic changes in wage-rent ratios are unlikely to represent a one-to-one change in Gini coefficients or other inequality measures. For instance, as it can be seen in Table 4, the Argentine wage-rent ratio for the period of 1890-1894 had an index number value of 364.7, but by 1915-1919, this same index had dropped to 53.6, or about 15% of the value of the original number (O'Rourke, Taylor & Williamson, 1996). Although the globalization of the late 19<sup>th</sup> and early 20<sup>th</sup> century certainly did cause great changes in income distribution, it is not reasonable to expect that the Argentine Gini coefficient changed by the same magnitude. So it is important to note that, although wage-rent ratios in Argentina were more than 2.5 times higher than in Australia in the first half of the 1890s, this does not mean that inequality in Australia was 2.5 times higher than in Argentina – it is even difficult to gauge exactly by how many Gini points (for instance) Argentina's inequality would be leading Australia.

Being this the case, it is still possible that, despite the fact that Argentina had lower overall inequality than Australia, the Latin American country had always had higher extraction ratios and, therefore, Sokoloff & Engerman (2000) argument (although with changes to include the concept of extraction ratios) cannot be satisfactorily refuted with the evidence collected in this paper. But it still could be the case that both Argentina's absolute inequality and extraction ratios were lower than Australia's, which would indeed provide evidence contrary to Engerman and Sokoloff's argument. And, although it is true that it is not possible with the data available to reach an unquestionable result backed up with extraction ratio results to settle this issue, it is still possible to see how likely and credible this possibility really is.

This can be done by comparing IPFs of both countries, as it has already been done previously in this paper and can be seen in Figures 5 and 6. As it has already been previously pointed out, before the 1890s there is a gap between the Argentine and the Australian IPFs (whether using \$300 or \$400 Geary-Khammy 1990 dollars as the subsistence level) that would allow comfortably for the possibility of an Argentina with lower Gini values, but higher extraction ratios than in Australia. But after the mid-1890s, the gap between the two countries' IPF narrow down significantly (as it can be seen on the Table 6, where the IPF values were averaged out to match the five-year periods of comparison), giving less room for such a scenario, although not completely ruling it out.

Table 6 - Inequality Possibility Frontier for Different Subsistence Levels

	Subsistence level of \$300		Subsistence Level of \$400	
	Argentina	Australia	Argentina	Australia
<b>1885 - 1889</b>	0.792	0.840	0.756	0.820
<b>1890 - 1894</b>	0.797	0.834	0.762	0.812
<b>1895 - 1899</b>	0.816	0.826	0.788	0.802
<b>1900 - 1904</b>	0.808	0.833	0.777	0.810
<b>1905 - 1909</b>	0.824	0.841	0.799	0.822
<b>1910 - 1914</b>	0.827	0.847	0.803	0.830
<b>1915 - 1919</b>	0.814	0.843	0.785	0.825
<b>1920 - 1924</b>	0.827	0.847	0.802	0.829
<b>1925 - 1929</b>	0.835	0.851	0.813	0.834
<b>1930 - 1934</b>	0.828	0.842	0.804	0.823
<b>1935 - 1939</b>	0.833	0.852	0.811	0.836

Source: Own estimations using Maddison Project data (2016).

From this, the lower Argentine inequality compared to Australia in the period of 1885 up until 1895 as shown by the ratio of wage-rent ratios does not necessarily mean that the Argentine extraction ratio was also lower than Australia's. As a matter of fact, the IPF of Australia is much higher than Argentina's. And the period after the beginning of the first World War is marked by higher inequality levels in Argentina than in Australia, making it unnecessary to compare extraction ratios. But the period of 1895 up until 1914 is a period that deserves closer attention. In this period, the ratio of wage-rent ratios between Argentina and Australia seems to suggest that inequality levels were higher in Australia than in Argentina, but, at the same time, this is a period marked by a very small difference in IPFs between the two countries, meaning that, although still possible, it would be unlikely that Argentina had significantly higher extraction ratios than Australia. In that specific period, the maximum difference between Argentina and Australia is never much further beyond the 30 Gini points mark, indicating that for a given level of inequality for the two countries, there will be very small differences in extraction ratios.

The whole globalization process that the world went through during the late 19<sup>th</sup> century and early 20<sup>th</sup> century did cause very strong changes in income distribution throughout the whole world and Argentina and Australia were no exceptions; much to the contrary, they were particularly affected by it. So, even if argued that both absolute inequality and extraction ratios were higher in Australia than in Argentina for the 1895-1914 period, it is hard to tell if this is a result specific of that period of time, or if it was a reflection and continuation of an already pre-existing trend of a more egalitarian Argentina and a more unequal Australia than most researchers expected. But this analysis has its values in putting into perspective the little evidence that there actually is available on the topic of inequality for the late 19<sup>th</sup> century and as to what it actually indicates, just as well as it puts into perspective the theory that Argentina (as any other Latin American country) has always had much higher inequality levels to the point of explaining why it failed to keep in the ranks of developing countries, while Australia's success relied on its more egalitarian economy.

## **4. The Engerman and Sokoloff Theory and the Evidence for Australia and Argentina**

In the paper of Sokoloff & Engerman (2000) the argument that Latin America was more unequal than the successful North American settler economies of the United States and Canada without any actual indicators of inequality, which is not a particularly problematic issue, considering how scarce and reliable those indicators were back then (and still are). Which they choose instead to do is to focus on differences in other aspects and indicators of those countries that would reflect the levels of inequality in the countries analyzed, since those indicators would be the outcome of inequality.

In particular, especial attention is given to the following four factors: political participation, education, immigration and access to land. According to their paper, more unequal societies would give too much power to a narrow group of people that would have no interest in investing in any of those factors, which would ultimately result in bad performances in all those elements listed above, therefore, bad performance in those factors would be an indicator of inequality, not to mention that those the low performance of these factors themselves could also be a negative influence in the economic development of the country in themselves.

With this in mind, Sokoloff & Engerman (2000) collect data on those indicators for several countries within the American continent and indeed find evidence that Canada and the United States outperform all Latin American countries in those metrics during the 19<sup>th</sup> century and early 20<sup>th</sup> century. Even though Australia is not included in their study and it is not guaranteed that their theory would be also applicable to Australia, given that it was colonized much later than the Americas, the reasoning that those four indicators were the result of unequal income distribution would still be valid despite the period of colonization. But since the findings of the previous section show that income distribution of Australia may actually have been more concentrated than in Argentina, it would be interesting to see if how those four variables behave in Argentina and Australia. Therefore, this chapter can be divided into four sections: 4.1 will focus on political participation; 4.2 will focus on education; 4.3 will focus on the openness to immigration; and section 4.4 will focus on access to land, a topic which deserves some especial attention.

### **4.1 Political Participation**

Australia started off as British penal colony that was essentially run in autocratic manner under the rule of an appointed British officer, but as time passed, the inhabitants of Australia slowly started to gain greater and greater participation within the government of the colony. In 1850 it is passed a piece of legislation in Great Britain allowing Australian colonies to create their very own legislative councils in which two thirds of the councilmen would be elected by popular vote and the remaining positions would be nominated by the British government. In order to be allowed to vote, the voter had to be a man above the age of 21 that met certain property requirements, although these voting rights were not extended to the indigenous population (Australian Electoral Commission, 2016; McLean, 2013). But according to McLean (2013), those property requirements had been meant to assure that political power would fall

disproportionately in favor of Squatters and other land owners (even if they had obtained their lands illegally). But according to the same author, due to certain miscalculations from the people who designed those requirements and the unexpected discovery in gold reserves in Australia that ended up raising the price of all properties, more people than expected qualified to vote. The result was a more representative election and a quick succession of expanding political rights.

The quick expansion of voting rights that followed can hardly be attributed by this simple accident of fate, a point that McLean (2013) acknowledges. According to him, Australia was bound to experience greater popular participation in politics, but this event did actually accelerate the process. And indeed in the following years each colony would relax voting restrictions based on property values and would soon replace them by the simple requirement of being 21 years of age or older. Many advances were to follow and even be adopted in other countries, such as the “Australian ballot”, a system of voting put into practice in 1857 in Victoria, Tasmania and South Australia (Australian Electoral Commission, 2016a) and would even be used in the implemented in the United States in the 1890s (Burnham, 1986), for example. In this system a ballot paper with the name of the running candidates were provided by the government itself, and all that the voter needed to do was to check the candidate for which he intended to vote. This system not only made voting easier, but it also assured that the vote cast into the ballot was secret.

In 1896, South Australia would be the first colony to extend voting rights to women and indigenous people above the age of 21. The year after Australia became a Federation (although still not formally independent from Great Britain, from 1901 onwards it was for all practical purposes an independent nation), universal suffrage for men and women was granted. Unfortunately, this right was not granted to indigenous people that still did not have such right, but this expansion of voting rights in Australia was nonetheless an extremely progressive change for the time in which they took place (Australian Electoral Commission, 2016a).

After the formation of the Australian Federation, data for voter turnouts in national elections become available and it is possible to see that right from the start, the voter turnouts in Australia were quite high: in the first national election for the house of representatives in 1901 had a voter turnout of almost 57% (Australian Electoral Commission, 2016b). As a matter of fact, Australian voter turnouts would always remain well above the 50% rate, reaching up to almost 83% in a referendum in 1916, until in 1925 a bill was passed making voting mandatory. After this voter turnouts sky-rocketed and then remained well above the 90% mark up to this very day, with the rare exception of the 2014 Senate election in which voter turnout was of 88.5% (Australian Electoral Commission, 2016a, 2016b).

On the other hand, Argentina had a much slower progress in its voting rights. Universal male suffrage was only established in 1912 by the Sáez Peña Law, which also made voting mandatory and introduced secret ballots (Mouzelis, 1986). Before that Argentina had literacy, and wealth requirements to be granted the right to vote, and it would not be until 1947 that women would get the right to vote. But despite these facts, Argentina, as pointed by Engerman & Sokoloff (2000), was one of the Latin American countries with the highest portion of the population casting their votes, losing only to Costa Rica and Uruguay (the last one also is a country considered to be a settler economy with relatively high economic performance for the time). But despite a better performance relative to other Latin American countries, political participation in Argentina was still much smaller than the ones observed in Canada and the United States (Sokoloff & Engerman, 2000).

Relative to Australia, Argentina also does not perform well at all. Although the data from Engerman and Sokoloff (2000) is not perfectly comparable to the data available from Australia, it is still possible to draw direct comparisons between the two. While the Argentine data refers to the proportion of the population that did vote on any given year, the Australian data only shows the proportion of the registered voters that did actually cast their ballots, which means that it does not reveal what percentage of the population was not registered as a voter.

The first comparison that can be made is from the year of 1916, in that year Argentina had already approved mandatory male suffrage, without any literacy or wealth requirements, but yet only 9% of the population were counted as voting (Sokoloff & Engerman, 2000, Table 2). Meanwhile, in the same year there was a referendum in Australia in which the voter turnout was of 82.75% (Australian Electoral Commission, 2016b). Although it is true that that particular referendum had above normal voter turnout rates for Australia (such rates usually fluctuated between 50 and 70% before voting became mandatory), those numbers can already start to cast some light on the issue.

A more appropriate year to compare might be the year of 1937, in that particular date, although women had still not be granted their right to vote, both Argentina and Australia already had made voting mandatory and neither of them voting restrictions, so the data can be somewhat comparable. It is estimated that in Argentina 15% of the population cast their ballots (Sokoloff & Engerman, 2000), while in their senate and house of representative elections, Australians had a 96% voter turnout (Australian Electoral Commission, 2016b), a figure that was not at all unusual when compared to other elections. Such a high voter turnout rate for Australia may have been indicative of a higher political participation of its population in comparison to Argentina, especially if one is to consider that in the year of 1937, roughly 55% of the population was between the ages of 20 and 59 (Australian Bureau of Statistics, 2014). Although no evidence was found that people aged 60 or above (which amounted around 10% of the population) were not expected to vote in Australia or that they were somehow not considered in the calculation of the voter turnout rates of Australia, it is being made here the assumption that they were not counted, simply to make a conservative estimation of the percentage of the Australian population that did vote. And even when not considering those older than 60, it still looks like a larger portion of Australians did vote than Argentinians.

These results are still very well aligned with what it would be expected from the Engerman and Sokoloff (2000) theory. According to their theory, a powerful elite would have no interest in expanding voting rights and having their influence on the government diluted, and a more unequal distribution of income within society would greatly favor such elites. Not only that, but a less representative political system means that the government is getting less diverse inputs and may not be well suited to make the decisions that are best for the society as a whole, and instead will only favor the interests of a small minority, greatly damaging the government's ability to adapt to new situations and develop the necessary institutions to a long-term development path.

## 4.2 Access to Education

The next factor to be analyzed is education. According to the argument of Engerman and Sokoloff, the richest sections of society do not have any particular interest in having public funds being directed to education, simply because they can afford their own private education and would much rather have those resources spent on something else. On the other hand, the rest of society would like the public provision of education, but when income distribution is too skewed in favor of the rich, they may find it difficult to have their demands heard over the ones from the elites.

Since the economies of the late 19<sup>th</sup> century and the early 20<sup>th</sup> century were not economies in which there was particular demand for high human capital and education was still only slowly expanding on the world, figures for literacy rate for Australia and Argentina can actually provide a very good comparison of the access of education between the two countries. In Engerman & Sokoloff (2000), the figures for literacy rates for several different countries of the Americas are displayed and it is possible to observe that Argentina performs quite well in comparison to other Latin American countries (with the exception of Uruguay, which has slightly higher literacy rates than Argentina). But even then, Argentina is well behind United States and Canada.

But by using figures from Roser (2016) for Argentina and the World average (this data actually presents very similar figures when compared to the ones from Engerman and Sokoloff, so there is no reason to expect any conflicting results) it can be seen that Argentina performed much better than the world average, and its literacy rates were extremely high for the period. But as Table 7 below shows, Argentina still underperformed compared to Australia, especially at the turn of the 20<sup>th</sup> century. Although there is no data available for the same periods to be compared, the available data still is quite revealing of the differences in education between the two countries. To put those differences in perspective, the literacy rate of Argentina in the year of 1900 was of 51% (Roser, 2016), which is only slightly higher than the Australian literacy rate of 45% of 50 year before that (Steckel & Floud, 1997).

Table 7 - Literacy Rates (1900 - 1950)

	<b>Argentina</b>	<b>Australia</b>	<b>World</b>
<b>1900</b>	51%	80%	21%
<b>1910</b>	60%		26%
<b>1920</b>	68%		32%
<b>1930</b>	75%		33%
<b>1940</b>	82%		42%
<b>1950</b>	88%	98%	36%

Sources: Roser (2016) for Argentina and world data and Steckel & Floud (1997)

But it would be wrong to conclude from these figures that the differences in human capital levels between the two countries were due exclusively to their differences in education policy. Both Argentina and Australia were countries that received massive inflows of immigrants during the 19<sup>th</sup> century and the

first half of the 20<sup>th</sup> century. As a result of this, a large portion of the education level of the Argentine and Australian population were actually determined by their immigrants, and not necessarily income distribution.

For instance, in the year of 1900, almost 23% of the Australian population consisted of foreigners and 18% of the total population had actually been born in the United Kingdom (England, Scotland Wales or Ireland) (Australian Bureau of Statistics, 2014). This is of particular importance, because by that same year, literacy rates in the United Kingdom were estimated to be of 97% (Steckel & Floud, 1997). Even though in 1850 and in 1800, the UK's literacy rates were of 61.3% and 52.2% respectively, there still is the possibility that a selection bias could exist among immigrants, resulting in a disproportionately share of the illiterate portion of the British population choosing to migrate to Australia. But, as it is pointed out by McLean (2013), there seems to have been no difference in educational level between the immigrants arriving in Australia and the already pre-existing Australian population. Even back during its time as a primarily penal colony, the prisoners sent to Australia had a similar human capital profile than the one seen in Great Britain, which can be explained by the fact that the prisoners sent to Australia were not sent there based particularly by the kind of crime for which they were convicted, but instead according to the skills that they could offer to the colony. Not only that, but many of the prisoners sent to Australia had only been convicted of political crimes that today would not be considered in any way a felony (McLean, 2013).

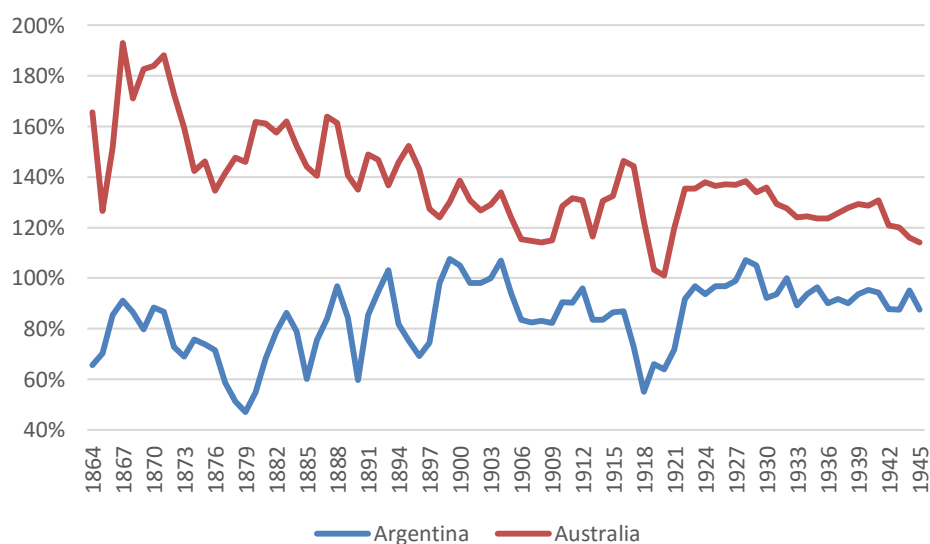
On the other hand, most of the Argentine immigrants came from either Italy or Spain, two countries with much lower educational level. With data from arrival and departure of foreigners traveling by boat in the second and third class (passengers of the first class were not required to go through the same bureaucratic procedures, not allowing to tell which first class passengers were foreigners) into or out of Argentina, Willcox (1929, Table V, p. 543-546) was able to estimate that Argentina experienced a net migration of almost 3 million people between 1857 and 1924; an extremely high number if one is to consider that the Argentine population in the year of 1924 was of 10 million people (Mitchell, 2007a). Of those 3 million immigrants, it is estimated that 45% of them came from Italy and another 35% came from Spain (Willcox, 1929). But unlike Great Britain, the literacy rates of Italy and Spain in the year of 1870 were only of 32% and 30%, respectively (Roser, 2016). Although there was found no evidence of there being any selection bias in the process of selecting those with the lowest human capital from the Italian and Spanish population into migrating to Argentina, it can be seen from this that Australia was most likely receiving immigrants with a higher educational level than Argentina, which could explain to a large extent their differences in education.

The differences in the origin of the immigrants going to Argentina and Australia certainly have several factors behind it, but there is one evident factor that does help explain the story: the relative wages of each of the two countries receiving the immigrants to the wages of the countries of origin of those immigrants. As it can be seen from Figure 8, Argentina's wage throughout the whole period of 1864 to 1988 was lower than the wages for low-skill laborers in Australia. It can also be seen from Figure 11, built from the data from Tables AA1 and AA2 in the appendix using the same method used to calculate Argentina's real wages compared to Australia's, that while Australia consistently had higher wages than Great Britain in the period that ranges from 1864 up until the end of the second World War, Argentina's real wages were only occasionally higher than Great Britain's real wages. This means that, from the point of view of a British migrant looking for work abroad, there is little reason to consider Argentina as a good destination for migration: there is no reason *a priori* to expect to earn significantly higher wages than



those available at home to justify migrating across the Atlantic Ocean. On the other hand, before the second World War, Australian wages were substantially and consistently higher than the ones available at home. Meanwhile, the wages of Spain and Italy were much lower than Argentina's (and by extension Australia) and, as it is shown by Williamson (1999, Table 4), Argentine wages were more than twice the value of the average wages of Italy, Spain and Portugal ranging from 207% of the wages of those Southern European nations in the 1870s to 268% in the 1890s and finally down to 201% in the 1930s. This would explain why so many people migrated from Great Britain to Australia, but not to Argentina; while it was still beneficial for Italians and Spaniards to migrate to Argentina given the levels of Argentina's wages compared to their own.

Figure 11 - Argentine and Australian Wages as a Percentage of Great Britain's Wages (1864-1945)



Source: Williamson (1995, Tables A1.1 and A1.2).

### 4.3 Openness to Immigration

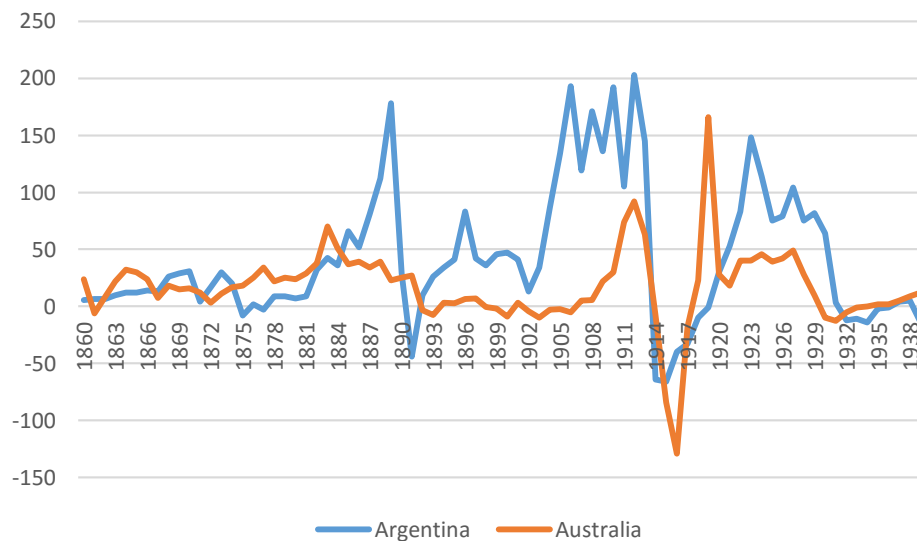
The next factor that Engerman & Sokoloff highlight is immigration and the receiving country openness to it. According to them, the more open position of immigration in Canada and the United States was in big contrast to the policies of the rest of the Americas, where countries failed in getting lands into the hands of small holders. Although they admit in their paper that both Argentina and Brazil had taken steps to stimulate immigration, Engerman and Sokoloff (2000) prefer to focus on how the successful North American economies had benefitted from their open immigration policy.

Even though it might have been true that the Spanish colonists had greatly limited immigration to their colonies with the intent of avoiding an influx of people that could shift the balance of power away from the colonial power, the argument that elites would try to limit immigration to keep control over their political influence does not seem to hold very well for the 19<sup>th</sup> century period. Not only Argentina received

a massive influx of immigrants, an influx even larger than Australia did, but both in the 19<sup>th</sup> century in Argentina and Australia there were immigration subsidy programs supported (and paid for) by their respective landed elites that were searching for cheap labor to employ at their lands (McLean, 2013; Timmer & Williamson, 1998). Australian squatters were notorious for favoring particularly the transportation of British convicts into Australia so that they could be used to work for a cheap price at their lands.

When comparing the data on immigration between Argentina and Australia, the Engerman and Sokoloff theory would create the expectation of a more open Australia, than Argentina. But as it can be seen from Figure 12 below, Argentina actually received more immigrants than Australia, especially after the turn of the 20<sup>th</sup> century. A detail that is worth pointing out in the Figure below is that the first World War did cause a drop in the inflow of migrants in both countries followed by a surge in the immigration once the war was over, but the data for Australia also accounts for the soldiers who left to fight the war and their return, meaning that the Australian numbers for that occasion do not perfectly reflect migration movements (Mitchell, 2007b). The immigration rates in Argentina were much higher than the ones observed in Australia, especially after the Baring crisis of 1890 and the first few years of the 20<sup>th</sup> century (Williamson, 1999), in which immigration to Australia almost grinds to a stop.

Figure 12 - Net Migration to Argentina and Australia, 1860-1939 (in thousands)



Source: Mitchell, 2007a; and Mitchell, 2007b

#### 4.4 Access to Land

The final point to be covered is the access to land, and this is indeed a topic that is worth greater attention than the other three factors discussed by Engerman & Sokoloff (2000). There is a large agreement in the literature that the development model of settler economies not only proved itself to be extremely successful, but also as a result of vast amounts of readily available free lands for new settlers to start their very own small farms. Argentina and Australia are two countries that are overwhelmingly described as being settler economies due to their vast territories, small population and exports of staple products (more notoriously wool for Australia and meat for Argentina).

The history of Australia at first does seem to fit quite well into this description. After finding out its economic potential after the discovery of prime pastures for grazing sheep for their wool in the 1820s, Australia started to receive greater attention from Great Britain. Many people migrated to Australia on their free will and many of them started raising sheep in those recently discovered pastures. Since all land of Australia was considered to be property of the British Crown, the only way, at first, for those new settlers to gain property rights over a run of land was to have it granted to them by the Governor of the colony. This system was quickly changed for one in which land could be bought from the colonial government (McLean, 2013).

But due to the lack of resources to provide property rights enforcement, the original intentions of the colonial government was to concentrate new settlers in a tightly packed region around the previously existing settlement in New South Wales. With this in mind it was created in 1827 the Nineteen Counties, which were the areas in which newly arrived immigrants were intended to be settled (Alston, Harris & Mueller, 2012). The lands sold by the colonial government were almost exclusively from within the Nineteen Counties and the minimum price of those lands were considered by many to be too expensive. This desire to concentrate settlers in a small region and ignore the vast amounts of lands were further reinforced after 1829 due to the writings of Edward Gibbon Wakefield (at the time a British convict that came into contact about the stories of Australia through his fellow convicts in Britain) advocating a systematic colonization of Australia. The plan, which became very popular, had the goal of promoting high immigration rates to Australia and high urbanization in order to lower wages and emulate Britain's industrial development (McLean, 2013).

But due to the lack of resources of the colonial power to enforce that new settlers did not set themselves up beyond the Nineteen Counties, most of the new Australian settlers promptly disregarded those limitations and started grazing sheep illegally in lands that they did not officially own, which is why sheep herders in Australia became known as Squatters. This naturally raised the potential for disputes between the new settlers, but due to the abundance of land and the mutual desire of avoiding any confrontation that would raise the attention of the authorities, there were barely any violent conflicts between Squatters. In this scenario Squatters preferred much more to negotiate and resolve their conflicts peacefully between themselves, each one enforcing the other's *de jure* property rights (Alston, Harris & Mueller, 2012).

Changes in property rights over land would happen in the following years in Australia, including the "selection" land reforms of Victoria and New South Wales in the years of 1860 and 1861, respectively. This particular reform gave the power to new settlers to select (hence the name for which those reforms would be known) at will small lots of lands and putting in check the hold of previous Squatters on large

runs of lands that they had leased, but were to become available for selection at the end of the period. Although this reform certainly had helped improving the distribution of land in Australia, it was met with great resistance from Squatters that made use of all loopholes possible and strategies to prevent larger redistribution of their lands. It is even pointed out that in the middle of the 1880s only some 27% of the selectors had remained in the lands that they had selected (Alston, Harris & Mueller, 2012). The authors even argue that this is the result of the inability of the Australian government to enforce those property rights and to create well organized district maps combined with the Squatters' obvious advantage in violence over selectors, guaranteeing that they chose to leave rather than fight for land.

This brief illustration of the Australian policy to land can actually show that land distribution had not always been completely egalitarian, as it might have been expected from a settler economy with so much freely available land, and that there were certain tensions between small land holders and larger land holders. But this does not offer a good enough picture of the issue. In a study by Frankema (2010), the Gini coefficient for the distribution of land holdings in Australia for the year of 1910 is estimated to be of 0.734, which is a much higher number than the one for the United States (a fellow settler economy) for the same year: 0.571. But even though Australian land distribution is much worse than the American one, it was still lower than the Argentine figure for 1914 (0.803).

When considering the history of land expansion in Argentina in the 19<sup>th</sup> century, it is no surprise to see that land would be more concentrated than in Australia. While in Australia the expansion of land use was a rather calm process (from the settler's point of view) raising at best some tensions with other settlers and facing occasional confrontations with the indigenous people of Australia, the land expansion in Argentina was far more violent.

The differences in the level of violence in the expansion of land use for both countries seem to arise mainly from the resistance put forward by the indigenous people. There were reports of attacks and confrontation in Australia between settlers and the indigenous people, but the Australian tribes did not pose great threats to settlers, which often chose to deal with them themselves, without having to rely on government intervention. In Argentina, on the other hand, the Indian population proved itself to be an extremely difficult opponent to beat and remained as a main obstacle to the expansion of land for decades.

In order to illustrate this point, figures for the total rural area of the province of Buenos Aires from Bértola, Gelman & Santilli (2015) can show that in 1839, the total rural area of the province was around 130 thousand Km<sup>2</sup>, that number went down to 100 thousand Km<sup>2</sup> in 1855 and then went back up to around 140 thousand Km<sup>2</sup>. The large drop in rural area from 1839 and 1855 can be explained by territorial loss through war at the hands of the native Indians of the region, which would in 1859 go one step further and even force the government of Buenos Aires to surrender to them in the year of 1859 (Zimmerman, 1945).

The threat of violence from the indigenous population in Argentina was far larger than anything witnessed in Australia. In Argentina the borders had to be strongly protected against attacks and military presence was a necessity for the Argentine case. This can be seen by the fact that in the year of 1869, around 54% of the Argentine government spending was dedicated to the military (Conde, 2009), although it is worth noting that the Argentine army had also been engaged in foreign wars during the 19<sup>th</sup> century. As a matter of fact, the indigenous threat was so great that the Argentine land expansion was greatly limited by it. The largest expansion in land use in Argentina would only happen after 1885, after the

military campaigns called “Conquest of the Desert”, a campaign considered by many to have been an act of genocide. It could even be said that the main aspect of a settler economy in Argentina only became true after 1885, because only then was land truly available to new settlers.

But this difference in violence between the Argentine and the Australian experience is likely to have had a very large impact in the land distribution of the two countries. According to the model developed by Dye & La Croix (2010), the cost of violence and conflict can play a big role as to how the settlement dynamics of a country play out. While in Australia the cost of violence from facing the natives could have been considered lower compared to Argentina, this meant that settlers could choose to set up their homes and businesses beyond the area of control of the government. Meanwhile, due to the higher threat of violence in Argentina, settlers would only be willing to accept to settle down within the area under government control and follow its rules in exchange for the governments more efficient protection services.

As a result of this, economies with fewer threats are more likely to make use of the vast amounts of lands available and settlers will organize themselves without government supervision in any way that better suits their very own demands. On the other hand, if the settlers choose to locate themselves within the region controlled by the government, they become subject to its rule and may have to conform with a suboptimal arrangement. This seems to have been the case of what happened in Argentina: the dictator Rosas was known for distributing large amounts of lands to his strongest political supporters, resulting in an extremely unequal distribution of land (Zimmerman, 1945).

The higher concentration of land in Argentina than in Australia as pointed out by Frankema (2010) does seem to be aligned with Engerman & Sokoloff argument of Argentina being plagued by higher inequality than other nations, as well as the expected outcome of the violent territorial expansion in that country. But despite this initial evidence of greater concentration of land, Bértola, Gelman & Santilli (2015) make an interesting remark that stops us from reaching the conclusion that that also meant a more unequal distribution of income. Although their study is focused only in the province of Buenos Aires, and not Argentina as a whole, and it covers the years of 1839, 1855 and 1867; Bértola, Gelman & Santilli (2015) find evidence that the income distribution in Argentina might not have been so unequal after all.

According to them, census data from Buenos Aires point to the fact that the vast majority of the Buenos Aires population (the largest Argentine province in terms of population) consisted of wage earners. As a matter of fact, the share of the population that earned wages was so high that it was estimated that 91% of that province’s population were earning wages in 1867. Not only that, but the income distribution between those salaried workers were very similar between them. So while it was true that land owners were on the top of the income distribution and that the top 1% of the income earners in Buenos Aires had incomes equivalent to 19% of the total income in 1867, a vast majority of the population earned very similar incomes. Or in other words, while income was concentrated in the hand of the very few, the rest of the income was very well distributed (Bértola, Gelman & Santilli, 2015).

With the large population growth experienced in Buenos Aires in the period studied by them, Bértola, Gelman & Santilli (2015) find evidence that the share of wage earners increase far more than the number of land owners, with wage earners going from 76% of the population in 1839 to the aforementioned 91% of the population in 1867. As a result of the larger participation of laborers in the population, the portion of the Buenos Aires income in the hands of laborers increased from 44% in 1839 to almost 67% in 1867. But considering that the differences of income found within wage earners in

Buenos Aires were quite small throughout the period of their study, Bértola, Gelman & Santilli (2015) find a strange and yet interesting result. While the increase in laborers would reduce the value of wages, reducing the wage-rent ratio, the increase in laborers in Buenos Aires was of such a size and the large equality among wage earners was maintained in such a way, that they observed a decreasing trend in inequality in Buenos Aires from 1855 to 1867, even though the inequalities between wage earners and land owners had increased. The results of the Gini coefficient estimations for Buenos Aires are available at the Table 8 below:

*Table 8 - Gini Coefficients for Buenos Aires*

	<b>1839</b>	<b>1855</b>	<b>1867</b>
<b>Gini</b>	0.421	0.561	0.356

Source: Bértola, Gelman & Santilli (2015)

Assuming that these results are correct, there are a few interesting observations that can be drawn. The first of which is that the Gini coefficient for Buenos Aires in 1867 is much lower than the coefficients reported for the world (using both van Zanden et al. and Bourguignon & Morrisson estimates), Latin America and North America plus Australia for the year of 1870 (see Table 1). This would suggest that Buenos Aires had a far more egalitarian distribution of income than the average of the world, which could be considered evidence contrary to the idea that inequality was high in Argentina (even though it is not known the distribution of income in the remaining provinces of Argentina). And this result of greater equality in Buenos Aires holds even though it is known that there were big differences in income inequality between land owners and wage earners.

There are two more interesting possible scenarios that must be considered when trying to understand the movements in inequality in the 19<sup>th</sup> century and early 20<sup>th</sup> century when data proves to be limited and no single indicator can provide a definite answer. In a polarized economy such as the one of Buenos Aires, it is still possible to experience a better distribution of income, even if land inequality is extremely high. The other more counter intuitive result is that as laborers came into the Buenos Aires economy, the overall level of wages went down, which could be expected to decrease the wage-rent ratio at the same time that Gini was reducing. This means that Gini would point to an improvement in equality, while factor prices would indicate greater inequality.

## **5. Conclusion**

With the institutional theory of economic development as a background, this paper has made a comparison of Argentina and Australia in the late 19<sup>th</sup> century and early 20<sup>th</sup> century, a period through which the world experienced great globalization (O'Rourke, Taylor & Williamson, 1996), in which it is estimated that Argentina and Australia experienced big shifts in their income distribution (Williamson, 1998), and in which it is believed that the economic development of the two analyzed countries started to diverge (Sanz-Villarroya, 2005). The institutional theory would credit the diverging paths of growth

between Argentina and Australia to their differences in income distribution, with the higher inequalities of the first one holding it back when compared to the second, so this particular comparison has given greater attention to the income inequality between the two countries, which is no easy exercise to make when considering not only the complicated nature of issues of inequality in themselves, but also the fact that data for the period regarding such information is not so easily available.

So by comparing the two countries the objective of this paper has not been on trying to find out what was the factor behind the divergence between Argentina and Australia. The goal of the paper, instead was to assess the data on inequality available for the two countries to check if the pattern of higher Argentine inequality was indeed true and then assess the credibility of the thesis that differences in inequality might have explained the differences in economic development of the two countries. The contribution of the paper, as it will be discussed in better detail in the following paragraph, was to compare the little evidence on inequality available of Argentina and Australia in light of the institutional theory. By doing so it was found that the evidence points to a story more complicated than the one described by Sokoloff & Engerman (2000).

The first point to make is that there is far more literature on inequality of Argentina than on Australia, which makes any comparisons more difficult due to a more limited availability of indices for both countries. But even for Argentina there is plenty of missing data and many works such as the one of Bértola et al. (2009) have to rely on strong assumptions to make their calculations for Argentina. Nonetheless there are indices that can be used to cast some limited light on the differences in inequality of the two countries. One such index is the wage-rent ratio that can actually compare the two countries by creating a ratio of such ratios. This indicator has very limited application since it can at best tell which one country has the highest inequality levels, but not by how much (and that is assuming a pre-industrial society in which income inequalities can be captured by the differences between wages of low-skill workers and land owners).

A look at wage-rent ratios of Argentina and Australia actually seems to indicate that up until the 1905-1909 period, the wage-rent ratios in Argentina were actually higher than in Australia, which would be an indication that Argentina had a more egalitarian distribution of income than Australia up to that point. This result provides evidence contrary to the claims of Sokoloff & Engerman (2000) that the falling behind of Latin American countries is due to the fact that they always had higher inequality than the rest of the world. This result would indicate that Argentina was less unequal than Australia at least for a brief period of time (there is no data available for Argentina before). But even then this result may not hold as it has been shown by Bértola, Gelman & Santilli (2015) with the example of Buenos Aires between 1855 and 1867 for an economy to have Gini coefficients indicating lower income concentration while wage-rent ratios would indicate the opposite.

Similar findings that Latin American countries did not really had higher inequality than other successful countries (Western Europe and other countries) was found by Williamson (2009), but this time using Gini coefficients. In that paper it is raised the well placed concern over extraction ratios, as explained in Milanovic (2009), that inequality is more damaging to poorer societies than to wealthier ones. This raises an interesting discussion point: within the institutional school, what would be the most important inequality that would affect the country's long-term development? The absolute measure of inequality (which could be measured by a Gini coefficient, for example)? Or the extraction ratio?

If the absolute level of inequality is what really matters, then the comparison of wage-rent ratios seem to indicate that lower levels of inequality in Argentina go contrary to the claims that it was the higher inequality of Argentina that hindered its development. If on the other hand, it is the extraction ratio that matters, then the answer is not as clear-cut. Although not completely possible to calculate an extraction ratio of Australia and Argentina for the period of the study, it is still possible to calculate the IPF of both countries and have an idea of how likely it would have been for Argentina to have had lower absolute inequality than Australia, but still higher extraction ratios. Due to the extremely similar income levels of the two studied countries from the mid-1890s onwards, it seems unlikely that at least for the period of between the mid-1890s until the first World War, even though it would still be possible.

But the possibility that Argentina might have actually had a better income distribution than Australia might not have been too far off. As it is shown by Bértola, Gelman & Santilli (2015), Buenos Aires had a surprisingly low income inequality compared to previous results, even though there were plenty of inequalities in the distribution of wealth, especially lands. This would suggest that it would have been possible for Argentina to have an extremely polarized society and still have an egalitarian income distribution according to most indicators. This also raises the question of what would be the most relevant factor influencing the long-term growth of a country: Would it be income distribution? Wealth distribution? Or Land distribution?

We have also compared the differences between Argentina and Australia as to what concerns some of the factors listed by Sokoloff & Engerman (2000) as being the outcomes of inequality proving the existence of higher inequality in Latin America. Those factors were access to political participation, access to education, open immigration and access to land. Although it was seen that Australia did perform better than Argentina in three of those factors, Argentina actually had higher immigration rates than Australia. Although not perfectly fitting their theory, these results do not necessarily confirm that Engerman & Sokoloff's analysis was right in focusing in those factors, especially when the evidence gathered in this paper seems to suggest that: not only Argentina might very well have been more egalitarian than Australia while it was underperforming in education, access to politics and access to land; but that it was still possible for having an extremely high land concentration of land and wealth and still have lower income inequality (a scenario that could very well be applicable to Argentina, since the example came from Buenos Aires).

The evidence here collected does seem to indicate that greater attention to understanding differences in inequality needs to be paid, especially for Australia, for which there is very little data available. Not only there is evidence pointing to an Argentina more egalitarian relative to Australia than it would have been expected, casting doubts that it is high inequality being the culprit behind low economic growth (as prescribed by the institutional theory), but there is evidence that inequality levels of income and wealth may not behave similarly. This last point begs the question: Is it income or wealth inequality that influence long-term economic growth as prescribed by the institutional theory? Or is it the case that it is neither and that instead it is another more specific, but yet related indicator?



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## Appendix

Table AA 1 - Real Wages (UK's real wages of 1905 = 100)

	<b>Argentina</b>	<b>Australia</b>	<b>UK</b>		<b>Argentina</b>	<b>Australia</b>	<b>UK</b>
<b>1864</b>	42	106	64	<b>1889</b>	81	135	96
<b>1865</b>	45	81	64	<b>1890</b>	58	131	97
<b>1866</b>	53	94	62	<b>1891</b>	82	143	96
<b>1867</b>	52	110	57	<b>1892</b>	91	141	96
<b>1868</b>	51	101	59	<b>1893</b>	101	134	98
<b>1869</b>	55	126	69	<b>1894</b>	86	153	105
<b>1870</b>	61	127	69	<b>1895</b>	79	160	105
<b>1871</b>	59	128	68	<b>1896</b>	74	153	107
<b>1872</b>	51	121	70	<b>1897</b>	79	135	106
<b>1873</b>	51	118	74	<b>1898</b>	102	129	104
<b>1874</b>	59	111	78	<b>1899</b>	114	138	106
<b>1875</b>	59	117	80	<b>1900</b>	106	140	101
<b>1876</b>	58	109	81	<b>1901</b>	99	132	101
<b>1877</b>	48	116	82	<b>1902</b>	99	128	101
<b>1878</b>	43	124	84	<b>1903</b>	100	129	100
<b>1879</b>	41	127	87	<b>1904</b>	107	134	100
<b>1880</b>	46	136	84	<b>1905</b>	94	124	100
<b>1881</b>	58	137	85	<b>1906</b>	92	127	110
<b>1882</b>	67	134	85	<b>1907</b>	89	124	108
<b>1883</b>	75	141	87	<b>1908</b>	89	122	107
<b>1884</b>	71	137	90	<b>1909</b>	88	123	107
<b>1885</b>	56	134	93	<b>1910</b>	95	135	105
<b>1886</b>	71	132	94	<b>1911</b>	94	137	104
<b>1887</b>	79	154	94	<b>1912</b>	97	132	101
<b>1888</b>	93	155	96	<b>1913</b>	92	128	110

Source: Williamson (1995), Table A2.1.

Table AA 2 - Real Wages (UK's real wages of 1927 = 100)

	<b>Argentina</b>	<b>Australia</b>	<b>UK</b>
<b>1914</b>	71	111	85
<b>1915</b>	64	98	74
<b>1916</b>	60	101	69
<b>1917</b>	51	101	70
<b>1918</b>	44	98	80
<b>1919</b>	60	94	91
<b>1920</b>	62	98	97
<b>1921</b>	76	127	106
<b>1922</b>	88	130	96
<b>1923</b>	90	126	93
<b>1924</b>	89	131	95
<b>1925</b>	93	131	96
<b>1926</b>	94	133	97
<b>1927</b>	99	137	100
<b>1928</b>	106	137	99
<b>1929</b>	105	134	100
<b>1930</b>	95	140	103
<b>1931</b>	102	141	109
<b>1932</b>	109	139	109
<b>1933</b>	100	139	112
<b>1934</b>	103	137	110
<b>1935</b>	106	136	110
<b>1936</b>	99	136	110
<b>1937</b>	100	137	109
<b>1938</b>	100	142	111
<b>1939</b>	102	141	109
<b>1940</b>	103	139	108
<b>1941</b>	101	140	107
<b>1942</b>	101	139	115
<b>1943</b>	105	144	120
<b>1944</b>	119	145	125
<b>1945</b>	112	146	128

Source: Williamson (1995), Table A2.2.

Table AA 3 - Real Wages (UK's real wages of 1975 = 100)

	Argentina	Australia	UK		Argentina	Australia	UK
<b>1946</b>	20	37	47	<b>1968</b>	31	59	75
<b>1947</b>	24	39	49	<b>1969</b>	32	61	78
<b>1948</b>	29	40	47	<b>1970</b>	33	63	84
<b>1949</b>	30	40	48	<b>1971</b>	34	67	86
<b>1950</b>	29	41	49	<b>1972</b>	32	68	91
<b>1951</b>	27	42	49	<b>1973</b>	34	73	96
<b>1952</b>	25	50	48	<b>1974</b>	38	82	98
<b>1953</b>	26	51	50	<b>1975</b>	37	78	100
<b>1954</b>	29	51	53	<b>1976</b>	24	78	101
<b>1955</b>	29	51	55	<b>1977</b>	23	76	97
<b>1956</b>	30	50	57	<b>1978</b>	23	76	103
<b>1957</b>	30	51	58	<b>1979</b>	26	74	104
<b>1958</b>	32	51	58	<b>1980</b>	29	75	103
<b>1959</b>	24	52	61	<b>1981</b>	27	76	103
<b>1960</b>	25	53	62	<b>1982</b>	25	79	105
<b>1961</b>	28	53	66	<b>1983</b>	31	76	109
<b>1962</b>	27	54	65	<b>1984</b>	37	79	113
<b>1963</b>	27	54	67	<b>1985</b>	32	77	116
<b>1964</b>	30	55	70	<b>1986</b>	32	75	121
<b>1965</b>	33	55	73	<b>1987</b>	30	72	125
<b>1966</b>	33	55	72	<b>1988</b>	28	70	129
<b>1967</b>	33	57	73				

Source: Williamson (1995), Table A2.3.