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Theory, History and Evidence of Economic Convergence in Latin America

by:

Paola Barrientos

December 2007

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Theory, History and Evidence of Economic Convergence in Latin America

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Theory, History and Evidence of Economic Convergence in Latin America

ABSTRACT

Economic convergence exists when two or more economies tend to reach a similar level of development and wealth. The study of convergence is an important topic because besides being useful for the debate between different theories, it can respond several inquiries such as if the distribution of income between economies has become more equal over time and if poor economies are catching up with the rich. Latin American countries are characterized by having few language barriers, similar culture, religion and common history. So convergence could be expected. However, literature about convergence in Latin America is scarce and preliminary analysis shows that divergence exists in the region. The thesis tries to fill in the gap by covering theoretical, historical and statistical evidence of convergence in the region during 106 years, from 1900 to 2005. The thesis uses a neoclassical growth model based on Solow and Ramsey models. After revising the economic history of 32 countries, several groups were identified and convergence was expected to occur. Different concepts of convergence are tested inside each group through graphs, single cross section regressions and panel data estimations. In general, the results show a success with the grouping. However, the groups that converged under all concepts are those composed by countries that have succeeded in industrializing and/or were able to build strong institutions that could tight welfare and economic growth in a globalization context. The speed of convergence for those countries is around 2%. It is also found that integration processes have not helped to accelerate convergence.

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Chapter 1

Introduction

The *economic convergence* term is used when two or more economies tend to reach a similar level of development and wealth. It is a topic that has been studied broadly by economists. On the one hand the study of economic convergence is used in the debate between the different theories of economic growth. The debate is usually between the neoclassical, endogenous and distribution dynamics models. The neoclassical models argue for economic convergence between similar economies, the endogenous models for no convergence at all, and the distribution dynamics models for economic convergence depending on how economies interact over time.

On the other hand, aside from the theoretical discussion, the study of convergence has a practical application in that it can respond to several inquiries. For example it answers to the questions of whether or not the income distribution between economies changes over time, if the differences in income across countries tend to disappear or increase, if poverty persists and whether those countries that were relatively poor at some point will later catch up with the rich countries. Certainly, it is important to detect income disparity between countries because it can retard the process of economic development.

Figure 1·1 reveals that the distribution of the world income, measured as the GDP per capita, has become increasingly unequal. The income gap between rich and poor countries has increased year after year. The figure also shows that, contrary to the world pattern, the OECD countries have been converging. This can be expected because the OECD countries are the most developed and may share more common characteristics between them than with the African countries for example.

However, not all countries with similar characteristics converge. As the figure shows,

the Latin American countries, which have few language barriers, similar culture, religion and common history, have diverged. The LA countries were more similar to each other than the OECD countries in 1950, but later the dispersion in their GDP per capita increased.

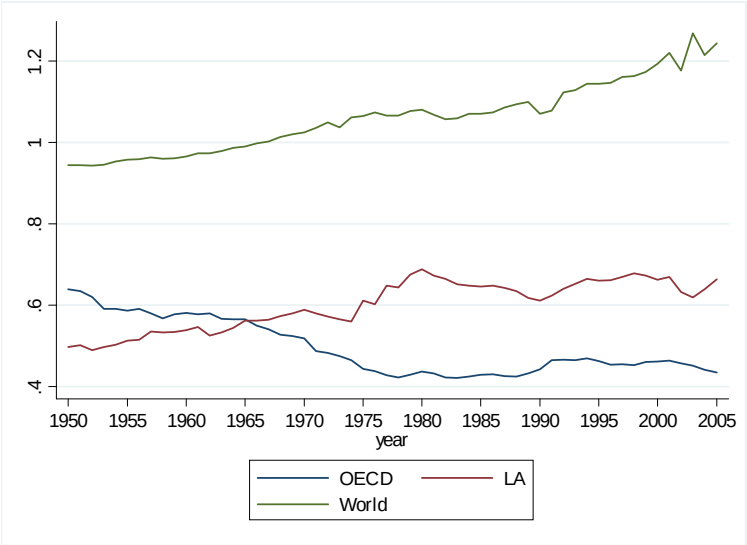

Figure 1·1: GDP per capita dispersion in the World, OECD and Latin America. Standard deviation of the logarithm of GDP per capita.

Nevertheless, when taking a closer look to the Latin American case, before 1950, the pattern of GDP dispersion changes. Figure 1·2 shows that LA's high dispersion is not only observed in recent years but it was also observed at the beginning of the 20th century. Moreover, when the income dispersion is graphed only for the 8 countries (Argentina, Brazil, Chile, Colombia, Mexico, Uruguay and Venezuela) that have complete data since 1900 until 2005, see Figure 1·3, the pattern of dispersion is reversed. The income dispersion among these economies, has diminished since 1900 and in 2005 the level for dispersion was even lower than the OECD countries.

So, income dispersion among the 8 Latin American countries (8LA) has diminished but among all the LA countries has increased. Furthermore, the pattern of dispersion for all LA countries has been varying over time. It seems that different stories can be told about

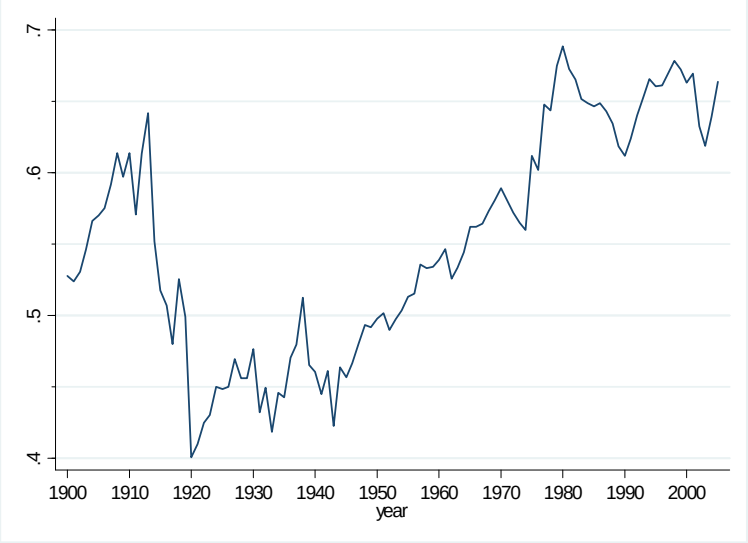

Figure 1·2: GDP per capita dispersion in Latin America. Standard deviation of the logarithm of GDP per capita.

convergence in Latin America and certainly, Latin American countries are not as similar as expected.

Literature about economic convergence in LA countries is scarce compared to other groups of countries. From the vast convergence studies outside Latin America, the majority are usually focused on investigating convergence among regions inside countries rather than cross-country studies. Similarly, the research found on Latin America is centered on national convergence studies. Only few studies are dedicated to studying convergence among countries. Almost none of the research connects convergence to the economic history of Latin America nor analyzes groups inside LA that are believed to be homogenous. Moreover research is usually conducted using only a small number of countries or few years.

This thesis will study economic convergence among LA countries from the beginning of the 20th century until 2005. The main purpose of this thesis is to explain why some LA countries have converged and why others have diverged. The study will answer the following questions:

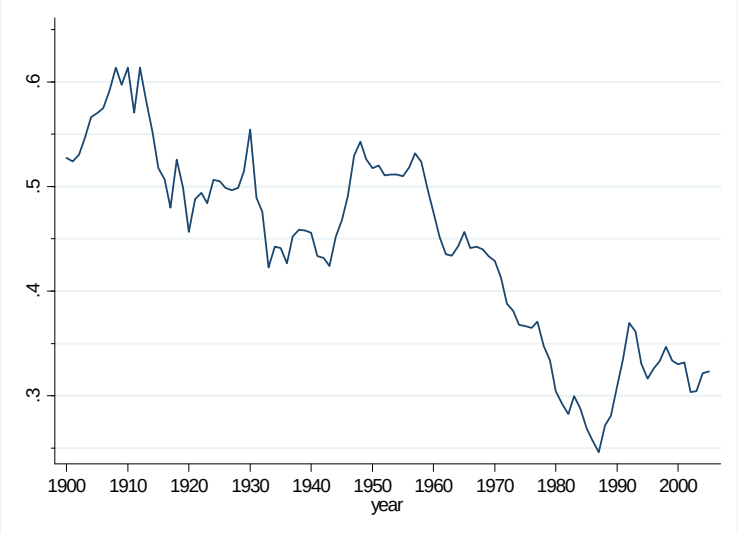

Figure 1·3: GDP per capita dispersion among 8 Latin American countries. Standard deviation of the logarithm of GDP per capita. The 8 Latin American countries are: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay and Venzuela.

- Has the convergence pattern changed in 106 years?
- Have economic shocks in LA influenced on the path of convergence?
- Is it possible to determine different periods of convergence?
- Under which periods have convergence accelerated? What are the empirical and theoretical reasons?
- Are there other groups besides the 8LA were convergence can be expected? Have these groups in fact converged?
- Which groups have converged the most? What are the empirical and theoretical reasons ?
- What are the reasons behind the apparent convergence among the countries in the 8LA? Should more convergence among them be expected?

- Why does it seem that all the countries have diverged but not those from the 8LA?
- In the future which countries may converge to which?
- Has economic integration processes in the region helped to accelerate the process of convergence?

In order to answer all the questions and comply the objective of the thesis, the study will cover theoretical, historical and statistical aspects of convergence in LA. The thesis will analyze different theories that study economic convergence with emphasis on the neo-classical growth theory, from which the basis model is extracted. The basis model is based on the growth model of Ramsey (1928) and optimal growth model of Solow (1956). The model has a solid theoretical framework, it is the most used in the literature, it is simple to test and it reaches concrete results about convergence. The model is able to test whether income distribution among different economies has become more equal and if there has been an upward mobility in the same distribution and how fast this has been.

Convergence will be tested in certain groups of countries were convergence is expected to occur. To identify those groups of countries the thesis will analyze carefully the most important facts of the Latin American economic history during 106 years. The convergence tests will be carried by non linear least square regressions and panel data estimations.

Therefore, the structure of the thesis is organized as follows. The first chapter will explain the theoretical background of economic convergence stressing in the model used in the study. The second chapter will present a review of previous literature about convergence. The third chapter will present and discuss the methodology to test convergence in LA. The fourth chapter will present the results of convergence in each of the groups identified after the carefully revision of the economic history of LA. Additionally the analysis will be extended to test convergence in the integration process that LA has witnessed. Finally, the conclusions will be presented.

Chapter 2

Theory of Convergence

This chapter introduces in detail, the theoretical growth model that will be used in the further estimations of convergence and compares it to other models that also study convergence. The purpose of this chapter is to make clear all concepts of convergence with an emphasis on those concepts that are used in this study.

The chapter contains four sections. The first section specifies the basic foundations of a neoclassical growth model (NGM), used in Barro and Sala-i-Martin (2004), which is based on the growth model of Ramsey (1928) and optimal growth model of Solow (1956). Furthermore, it discusses the differences between absolute and conditional convergence, and beta (β) and sigma (σ) convergence. The second section explains the main characteristics of other three models that also study convergence. The first one is the endogenous growth model. The second, the distribution dynamics model that derives convergence within clubs of countries that emerge over time. The third is the technology diffusion model which is based on microfoundations and derives the catching-up convergence concept. The third section explains briefly the link between the theory of economic integration and convergence. Finally, a summary of the most important points and concepts is presented.

2.1 The Neoclassical Growth Model

The neoclassical growth models try to predict stylized facts of economic growth and one of them is convergence. It seems, empirically, that conditional on relevant characteristics for economic growth, there is a negative relation between initial income levels and growth rates of income of a certain period. This means that rich countries tend to grow less than poor countries, once some conditions are settled. This kind of convergence is known as

conditional convergence and it is well forecasted by the NGM whenever economies have similar technologies and preferences.

The NGMs are based on an economy with a specific production function and a utility function that represents its preferences. Under some assumptions, the economy will eventually arrive at an equilibrium called the steady-state, where it cannot grow anymore. If the economy is approaching its steady-state, there is convergence but if it is moving away from the steady-state, there is divergence. The NGM used here, is able to calculate the speed of convergence at which the economy gets closer to its own steady-state. The procedure is explained below

2.1.1 Production Function

The production function is a Cobb-Douglas with labour augmenting technological progress[1]:

$$Y = F(K, LA) = K^{\alpha}(LA)^{1-\alpha}, \tag{2.1}$$

where Y is the output, K, L and A are the capital, labour and technology respectively, and α is the share of capital ($0 < \alpha < 1$). The technology A grows at a constant rate x.

The former equation can also be written in effective labor terms (since is homogenous of degree one):

$$\hat{y} = f(\hat{k}) = A\hat{k}^{\alpha}, \tag{2.2}$$

where $\hat{y} = Y/AL$ and $\hat{k} = K/LA$. In a closed economy, under equilibrium, savings equals investments, implying that $\hat{k}$ moves dynamically according the following equation:

$$\dot{\hat{k}} = A\hat{k}^{\alpha} - \hat{c} - (\delta + x + n)\hat{k}, \tag{2.3}$$

where $\hat{c}$ is the consumption in effective labor terms, δ is the depreciation rate of capital and n is the constant growth of the population (or labor).

[1] As usually a neoclassical production funtion, assumes constant returns to scale in capital and labour, positive but diminishing marginal product of inputs, essenciability of inputs and satisfaction of the Inada conditions.

2.1.2 Utility Function

Households are assumed to have infinite time horizon and they maximize the following utility function:

$$U = \int \left[\left(c^{1-\theta} - 1 \right) / (1-\theta) \right] e^{nt} e^{-\rho t} dt, \tag{2.4}$$

where c is consumption per capita, θ is the elasticity of marginal utility and ρ is the rate of time preference[2] The solution of the maximization problem yields to the dynamic equation for consumption (Ramsey, 1928):

$$\dot{c}/c = (1/\theta) \cdot \left[\alpha \hat{k}^{\alpha-1} - \delta - \rho \right]. \tag{2.5}$$

2.1.3 Steady-State Equilibrium

Definition 1 *The steady-state equilibrium is the situation in which various quantities grow at constant rates (Barro and Sala-i-Martin, 2004)*

The steady-state is reached when output, capital and consumption in terms of effective labor no longer grows ($\dot{\hat{y}} = \dot{\hat{k}} = \dot{\hat{c}} = 0$), so variables in terms of per capita grow at a constant rate, x, and level variables grow at rate $x + n$.

From Equation(2.3), the Steady-State is given by:

$$sf(\hat{k}^*) = (\delta + x + n)\hat{k}^*,$$

where $\hat{y}^* = f(\hat{k}^*)$ is the steady-state value of $\hat{y}$ and s is the saving rate ($s < 1$).

When an economy starts with a level of capital per unit of effective labor lower than the one in the steady-state ($\hat{k}(0) < \hat{k}^*$), the capital level will monotonically increase until it reaches its steady-state value. This means that its growth rate declines monotonically[3]. Since output varies together with capital, the output growth rate will also be monotonically declining when its level is below its steady-state level. In other words poor countries

[2] and by the transversality condition, that assures utility maximization in the long run, ρ is higher than $n + (1-\theta)x$.

[3] The proof is in Appendix 2D of Barro and Sala-i-Martin (2004).

will grow faster than rich countries, assuming that both have the same technologies and preferences, until they converge to the same steady-state.

2.1.4 The Logic of the Speed of Convergence

In order to quantify the speed of convergence it is necessary to log-linearize the Equations(2.3) and (2.5) around the steady-state. This consists in taking the first-order Taylor expansion of both Equations[4]. The result, which is saddle-path stable, is:

$$\log\left[\hat{y}(t)\right] = e^{-\beta t} \cdot \log\left[\hat{y}(0)\right] + (1 - e^{-\beta t}) \cdot \log(\hat{y}^*), \tag{2.6}$$

where β is the negative eigenvalue from the process of Taylor expansion and $0 < \beta < 1$. The condition $\beta < 1$ rules out leapfrogging or overshooting, where poor economies are systematically predicted to get ahead of rich economies at future dates and when $\beta > 0$ means there is convergence. Thus β can be interpreted as the speed of convergence.

After doing some transformations, Equation(2.6) can be written as:

$$(1/T) \cdot \log\left[y(T)/y(0)\right] = x + \frac{(1 - e^{-\beta T})}{T} \cdot \log\left[\hat{y}^*/\hat{y}(0)\right], \tag{2.7}$$

where the left-hand side of the equation is the average growth rate in the interval from 0 to T. Notice that the left hand side is not anymore in terms of effective units (in terms of $\hat{y}$). This is because the "effective" part, the technology, now appears in the right-hand part as the growth rate of technology x because of the transformations.

Equation(2.7) says that the average growth rate of output in the interval T is related negatively to the initial output $y(0)$ in relation to the steady-state output $\hat{y}^*$, and to the technology growth rate x, while keeping β and T constant. This implies conditional convergence in the sense that a poor country A will grow faster than a rich country B, understanding that country A is poorer because it is away from the steady-state than country B is and that both have the same steady-states.

[4] This is done in Appendix 2D of Barro and Sala-i-Martin (2004).

If the period taken into account is quite long, and β is taken as given, the average growth rate of output will tend to approach the technological growth rate and the negative effect of the initial position, $y(0)$, will be diminished. So as $T \to \infty, (\frac{1-e^{-\beta T}}{T}) \to 0$. And when the period is quite short $T \to 0, (\frac{1-e^{-\beta T}}{T}) \to \beta$ (by l'hopital rule), the negative effect of $y(0)$ will be β.

When β increases, taking T as given, the term $(1 - e^{-\beta t})$ increases as well, which means that at high levels of β, the response of the average growth to the difference between $\log y^*$and $\log y(0)$ is greater.

2.1.5 Theoretical Behavior of the Speed of Convergence: an Unrealistic prediction

The speed of convergence determination, is also a result from the log-linearization and by assuming a constant saving rate as in Solow (1956), yields[5]:

$$\beta = (1 - \alpha) \cdot (x + n + \delta). \tag{2.8}$$

Here, β depends on parameters not connected to the utility function; it is increasing with the exogenous technology growth, population growth and the capital depreciation, and decreasing with the share of capital, α. In the extreme case when $\alpha = 1$, convergence is zero. This would be the case of the endogenous growth model with AK technology.

[5] When assuming a varying saving rate, β is:

$$\beta = \tfrac{1}{2}\left\{\zeta^2 + 4 \cdot (\frac{1-\alpha}{\theta}) \cdot (\rho + \delta + \theta x) \cdot \left[\frac{\rho + \delta + \theta x}{\alpha} - (n + x + \delta)\right]\right\}^{1/2} - \tfrac{1}{2}\zeta,$$

where $\zeta = \rho - n - (1 - \theta) \cdot x > 0$

This complex definition of speed of convergence varies with a lot of parameters linked and not linked to the utility function and with the behavior of the saving rate during the transition towards its steady state, which is:

$$s^* = \alpha \cdot (x + n + \delta)/(\delta + \rho + \theta x).$$

The transitional dynamic of the gross saving rate is monotonic; when the economy begins with a low value of $\hat{k}$, then the saving rate increases if $s^* > 1/\theta$, decreases if $s^* < 1/\theta$ and it is constant if $s^* = 1/\theta$.

The way parameters influence β depends on the interaction with the saving rate. A higher value of θ, the intertemporal substitution coefficient, increases the chance that the saving rate rises with $\hat{k}$ and therefore reduces the speed of convergence (because we are closer to the steady state). In (Barro and Sala-i-Martin, 2004), it is shown that when ρ, δ and/or x increases the speed of convergence increases as well, but when n increases the impact on β is not clear.

To have some idea of the theoretical speed of convergence one can substitute believable values for the parameters in Equation(2.8) . In Barro and Sala-i-Martin (1992) the exercise was done with values of growth rates for technology and population of 2% per year for each variable, capital depreciation rate of 5% per year, constant saving rates and a capital share, α, of 0.35. The result was $\beta = 0.059$ per year which means a half-life for the logarithm of output per effective worker of 11.8 years ($= \ln(2)/0.059$). A speed of convergence of 0.059 is a rapid rate compared to $\beta \approx 0.02$, which is the empirical estimate normally found by applied research (see chapter 3)

To get the empirical estimates of $\beta \approx 0.02$, according to the theory, would imply a capital share of 80%, which is extremely high. A more ample definition of it as human and physical is one way to explain the high share of capital. A capital share of 80% (and $x = n = 0.02, \delta = 0.05$) implies that economies tend to stay far from the steady-state for long periods: every 34.7 years an economy will be in half way closer to reach its steady-state.

Thus to explain through theory the 2% of convergence found empirically, requires high levels of share of capital, α. Under variable saving rates, this is possible if the intertemporal substitution parameter, θ, acquires high values and if the depreciation rate of capital, δ, is almost zero. Unfortunately these values are not realistic at all (Barro and Sala-i-Martin, 2004).

Relaxing Assumptions

In order to find an explanation of the high theoretical speed of convergence or a solution to "cool it down", different variations were introduced and some assumptions relaxed. For instance, when permitting for perfect factor mobility, unrealistic results were found. Among them were infinite theoretical speeds of convergence, and that the most patient country asymptotically owned everything and consumed almost all of the worlds output (Barro and Sala-i-Martin, 2004).

An additional variable was added, the costs of installing extra capital, which indeed

brought finite speed of convergence. These adjustment costs cannot by themselves explain the low speed of convergence observed empirically. Then, to relax the assumption of infinite horizons and to open the economy, both together, do not solve the problem either.

Barro, Mankiw, and Sala-i-Martin (1992) extended the neoclassical growth model by distinguishing between two types of capital: the first one is mobile and can be used for borrowing and lending from one country to another whereas the second one cannot be used as collateral (the second type can be interpreted as human capital is not mobile). Under these extensions, the theoretical value of the speed of convergence is close to the empirical of 0.02. The estimations are still based on high proportions of ample capital, $\approx 80\%$, but from this, some can be used as collateral and some not. The proportion that can be used as collateral is from $0 - 75\%$ which yields a convergence speed of 0.014 to 0.035.

2.1.6 Absolute vs. Conditional β-Convergence

Above, the concept of conditional convergence was explained, which in short says that when the growth rate of a country is positively related to the distance from its initial level of income to its own steady-state. In other words, countries grow more if they are initially further away from their own steady-state.

Meanwhile absolute β-convergence exists when poor economies grow faster than rich ones, regardless of whether they have a common steady or not. So poor countries tend to "catch up" when time passes.

Equations

The two concepts can be described through equations. For the **conditional convergence**, the average growth rate from Equation(2.7) can be written for each country i and include a random disturbance $u_{i0,T}$:

$$(1/T) \cdot \log\left[y_{iT}/y_{i0}\right] = x_i + \frac{(1 - e^{-\beta T})}{T} \cdot \log\left[\hat{y}_i^*\right] - \frac{(1 - e^{-\beta T})}{T} \cdot \log\left[\hat{y}_{i0}\right] + u_{i0,T}. \qquad (2.9)$$

If $\beta > 0$ there is conditional convergence.

absolute β-convergence still defines a negative relation between the average growth rate and the initial income per capita, but excludes explicitly the steady-state income and the technology growth rate:

$$(1/T) \cdot \log [y_{iT}/y_{i0}] = a - \frac{(1 - e^{-\beta T})}{T} \cdot \log [\hat{y}_{i0}] + u_{i0,T}, \tag{2.10}$$

where a is a constant, that may or may not include the steady-state and technology growth rate, and if $\beta > 0$ there is absolute convergence

Both concepts can refer to the same definition and can be measured by the same equation, in some cases. But in others they contradict each other and measuring can raise some problems.

Different Concepts When Different Steady-States

When economies reach conditional but not absolute convergence, means that a rich economy can grow faster than a poor if the rich is further below its own steady-state than the poor is in relation to its own steady-state. So both, rich and poor, have different steady-states. In this case the correct equation to measure convergence is Equation(2.9) because it will measure the convergence of each country to its own steady-state. If instead Equation(2.10) is used, it will be misspecified and the error term will be:

$$w_{i0,T} = u_{i0,T} + \frac{(1 - e^{-\beta T})}{T} \cdot \log [\hat{y}_i^*] + x_i$$

and if $\hat{y}_{i0}$ is related to $\hat{y}_i^*$, β as estimated will be **biased**. But if $\hat{y}_{i0}$ is not correlated to $\hat{y}_i^*$, β will still be correctly estimated though Equation(2.10) misspecifies the underlying process.

Equivalent Concepts When Similar Steady-States

Conditional and absolute convergence have the same definition for country A and B if both converge to the same steady-state. This will be the case if both have equal technologies

and preferences. In this case, when estimating Equation(2.10) the constant a will be:

$$a = x_i + \frac{(1 - e^{-\beta T})}{T} \cdot \log [\hat{y}_i^*] \tag{2.11}$$

and β is consistent.

2.1.7 β vs σ Convergence

The two concepts studied above refer to β-convergence. The βs from Equation(2.10) and Equation(2.9) try to measure the mobility of income within the same distribution. On the other hand σ-convergence studies how the distribution of income varies over time.

σ-convergence analyzes the dispersion of income of diverse economies and convergence occurs if the dispersion is diminishing over time. Usually it can be measured as the standard deviation of the logarithm of income per capita across different economies.

It can be seen from Appendix A, that when there is β divergence it does not necessarily lead to σ-convergence. But in order to have σ-convergence it is necessary to have β-convergence. Therefore, β-convergence is a necessary but not sufficient condition for σ-convergence.

2.2 Other Models

2.2.1 Endogenous Growth Models

The endogenous models differ from the NGM in that they do not assume diminishing returns to capital. For example the one sector AK model is based on the following production function:

$$Y = AK,$$

which can be compared to a Cobb-Douglass when the share of capital is 1, $\alpha = 1$. This can be interpreted as a taking a broad definition of capital that includes human capital.

This type of production function violates the Inada conditions and does not exhibit the diminishing returns to capital. Replacing $\alpha = 1$ in Equation(2.8), leads to $\beta = 0$. So it does not matter if a country is poor or rich, the poor will never catch up to the rich.

In general, the one sector models of endogenous growth fail to predict any kind of convergence, even when perfect or partial capital mobility is introduced. However variations in the AK model can explain convergence. That is the case when the saving rate, the depreciation rate and/or the population growth rate are allowed to be endogenous (determined by the level of capital in the economy). But as pointed out by Sala-i-Martin (1996a), these variations are often seen as implausible, not deeply explored or fail to explain convergence.

In the case of two sector models, Mulligan and Sala-i-Martin (1992) have showed that these models are able to predict conditional convergence in the same way that the NGM does.

2.2.2 Models of Distribution Dynamics

In the literature, this type of models is also referred to as polarization, persistent poverty (or poverty traps), stratification, and/or clustering models (Quah,1996; Quah, 1997; Azariadis and Stachurski, 2005; Durlauf and Johnson, 1995).

In the models of distribution dynamics, each economy has multiple locally-stable steady-states. Transitory shocks may have permanent effects whereas the NGM assume that economies have a unique, globally stable steady-state equilibrium and that the transitory shocks affect the income ranking of an economy in the short run but do not have lasting effects (Galor, 1996)

The idea of the models of distribution dynamics can be explained by figure 2·1, which shows hypothetical income distribution across countries. The GDP per capita is showed on the vertical axis and time on the horizontal. At time t_0 the income distribution has one peak, while later, say at t_1 there are two peaks: one for countries with high levels of income and another for low. Countries with middle income levels have disappeared. Some went to the low income group and others to the high income group. At least it is clear that the ones that were at t_0 among the richest ended up in the top group in t_1 and viceversa.

This process of changing distribution in income into two is called "emerging twin peaks". This means that at t_1, countries converge to two different groups, even though they were

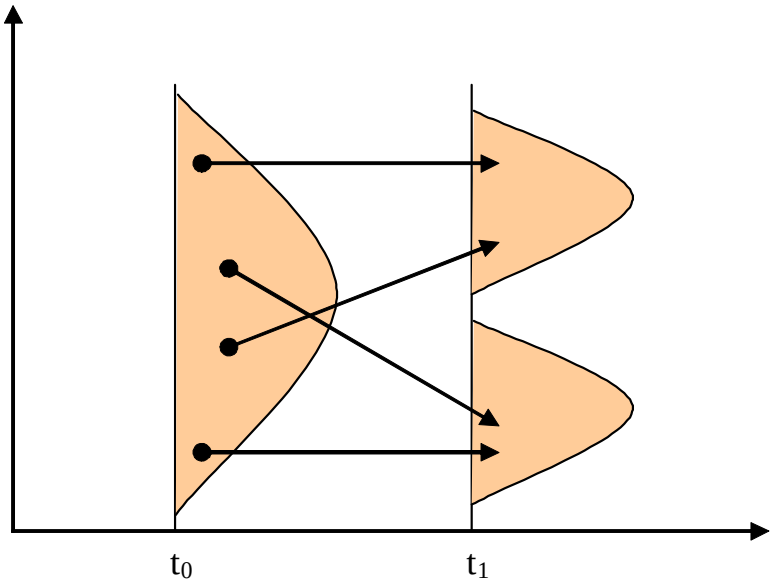

Figure 2·1: Distribution Dynamics. Hypothetical income distributions in two periods. One-peak income distribution in period t_0 and two-peak income distribution in period t_1. Taken from Quah (2007).

at t_0 in the same group. The number of groups at t_1 can also be more than two, in which case the process is called "stratification" and each group is called a "club".

From this analysis, the concept of "Club Convergence" arises. Club convergence among a group of countries exists, when they have a similar steady-state and when they depart from similar initial conditions (Galor, 1996). Quah (1996) emphasizes that what matters most is how a single economy performs relative to others, rather than to its own history.

According to Galor (1996) the NGM can generate both the conditional and the club convergence concept, particularly the neoclassical model of overlapping generations. He affirms that in practice both concepts can be estimated by the inclusion of empirical significant variables like human capital, income distribution and fertility in the NGM, along with capital imperfections, externalities, and non convexities.

2.2.3 Technology Diffusion Models

These models predict convergence based on microfoundations. It is argued that poor countries will "catch-up" slowly to the rich ones (leaders), because the followers can imitate the products invented by the leaders. This idea was introduced by Nelson (1966), where it was stated that the technological progress for a country is a function of the distance between its level of technology and the world leader:

$$\frac{\dot{A}_i}{A_i} = \lambda(A_{leader} - A_i)$$

By assuming that imitation and implementation costs are lower than innovation costs, when very little has yet been copied, the lagging countries can imitate and converge gradually to the leaders level of technology (Barro and Sala-i-Martin, 2004).When more products are being copied, the imitation and implementation costs will rise. Therefore convergence is created by a diminishing returns to imitation.

In practice, these models can be estimated in a similar way as the NGM. Once convergence is found, it is hard to distinguish whether the reason of its existence is the neoclassical hypothesis of diminishing returns to capital or the hypothesis of positive (but slow) rates of technological diffusion unless one can model how technology evolves in the leading countries (Barro and Sala-i-Martin, 2004).

The process of technology diffusion is still in debate. Some researchers argue that the technology diffusion is via foreign investments (Barro and Sala-i-Martin, 2004), trade (Romer,1990; Aghion and Howitt, 1992), flows of people (Barnebeck and Dalgaard, 2006) or the type of institutions and geography (Acemoglu et al., 2004).

2.3 Theory of Integration

Economic integration among countries is linked to economic convergence. The theory of economic integration studies the creation of a common market as a process that goes together with economic growth. The deepening of this process tends to be deepened, via

monetary and political integration, coupled with growth is related directly to the idea of convergence among countries and regions (Sotelsek, 2001).

However, the process of integration can have obstacles that delay the process of convergence. One obstacle is that the integration process may have a different impact in certain economic sectors and regions. Another is the possible absence of considerable efforts of harmonization of institutions and policies. These obstacles postpone one of the main objectives of the integration process, which is to increase the standards of living of its population and diminish the existent disparities in the standards of living of their citizens, (Sotelsek, 2001).

Conceptually, **economic convergence** can be defined broader than discussed so far as a process, spontaneous or with some intention, that leaves economies in a similar degree of development. **Economic integration** can be defined as a process that is intended to follow specific objectives and rules previously agreed to by its members that lead to economic convergence.

Alternatively, full economic convergence is the last resulting phase of economic integration. The integration process itself has three phases, (Heirman, 2001):

1. Convergence of basic instruments like common external tariffs and commercial regulation among its members and to other countries
2. Convergence in macroeconomic, fiscal and social policies
3. Convergence in real terms

These phases are connected to the stages of economic integration, which total six, and for every two stages, one phase of convergence is reached. The stages are:

1. Preferential trading area
2. Free trade area
3. Customs Union

4. Common market

5. Economic and Monetary Union and

6. Complete economic integration.

Currently, the only integration process that is in the last phase of convergence and last stage of economic integration is the European Union. Nevertheless, Walz (1999) tested the hypothesis that integration has promoted economic convergence among the European countries and found that it is rejected. It seems that the economic convergence created by the European Union is across regions rather than countries.

In LA the most advanced economic integration processes are still in the third stage of economic integration: custom unions. Consequently, they are in the second stage of convergence; in macroeconomics, fiscal and social policies. Still, this study will test for convergence in real terms among countries in each of the custom unions in Chapter 5.

2.4 Summary

This chapter has explained the main characteristics of the neoclassical growth model used in Barro and Sala-i-Martin (2004), which is the base model for further estimations, and has presented other important theories about convergence.

The theory of convergence, in general, has defined four concepts of convergence: absolute β , conditional β, σ and catch up convergence. Absolute β-convergence exists when per capita incomes of a number of economies converge to one another in the long run, independently of their initial conditions. Conditional β-convergence exists when per capita incomes of economies that have identical their structural characteristics (e.g. preferences, technologies, rates of population growth etc.) converge to one another in the long run independently of their initial conditions. Club convergence is β conditional convergence conditioned also on having similar initial conditions. σ-convergence across a group of economies exists if the dispersion of their real per capita GDP tends to decrease over time.

Finally the concept of catching up, means that poor economies will reach the rich economies when time passes, which is the same concept as absolute β convergence.

Once convergence is found, under the NGM, the theoretical reasons can be two: diminishing returns to capital and/or lower costs of technology imitation than innovation. Additionally, convergence can also be due to a result of an intended process, in the case of integration agreements. However economic convergence is expected only in the last stage of the integration process.

Chapter 3

Empirical Literature

This chapter presents a review of previous empirical research on convergence. The purpose of the chapter is to summarize the main results found in world wide studies and specially in LA.

The chapter has three sections. The first explains about the usual methodology used to test convergence and discusses the "typical" values found for the speed of convergence in different samples. The second section is focused on the LA case. The last section summarizes the main findings.

3.1 World Wide Studies

In general, empirical research about convergence has focused on the conditional convergence concept rather than the absolute, given that the latter is rejected by the fact that poor countries have not converged to the rich ones yet (De Long, 1988). The usual procedure is to run a regression derived from the NGM theory, where the dependent variable is the growth rate of the GDP per capita during a specific period and one of the explanatory variables is the initial GDP per capita of the period. The coefficient of the initial GDP per capita determines whether there was convergence or not[1].

There are two ways to test conditional convergence. One is to add to the regression explanatory variables that proxy for the steady-state,and the other is to group similar economies and test for absolute convergence assuming they have the same steady-state (no

[1]There are other methods as GMM (Caselli, Esquivel and Lefort, 1996) Chamberlein Matrix (Cashin and Loayza, 1995),(Cashin and Sahay, 1996) and (Loayza, 1994). Error Correction Models (Astorga et al., 2005), and Unit root test (Chumacero, 2002). For the dynamic income analysis: MonteCarlo simulations and sthochastic Kernel distributions analysis (Quah,1996), (Quah, 1997) and (Blyde, 2006) among others.

explanatory variables). The majority of the studies examine samples of economies inside a country (i.e. regions, states, cities, provinces, etc.) because they are more likely to share the same steady-state.

The existing research concentrates on convergence among industrialized economies. De la Fuente (2002) presents an extensive review of literature and summarizes the key features of convergence pattern in the following tables. Table 3.1 shows regional convergence in different countries and different samples. The first column shows the results with a single cross section and the second with panel data regressions. The results show higher speeds of convergence when estimating through panel data than through single cross section. However, the general pattern is that the speed of convergence is around 2%.

Table 3.2 shows the results for convergence tests among countries and regions with cross-section data. The last column, shows whether or not controls were added in the growth equation. It can be seen that only for the first case, of 98 countries, results with and without controls vary a lot. The other results show that when the grouping is done among similar countries, absolute and conditional convergence tend to be close. Again, the typical speed of convergence is around 2%.

3.2 Studies of Latin America

The research done in LA is scarce. It is hard to find as many studies as for the industrial countries. However, after an exhaustive revision of literature, only 11 studies analyzing convergence across LA countries were found

Table 3.3 summarizes the eleven studies. The first two studied convergence in a international context. They tested for convergence in several regions and one was LA (18 countries). Helliwell and Chung (1992) found that, during 25 years (1960-1985) and after controlling for several variables, the OECD and LA countries strongly converged, while African countries weakly converged and Asian countries did not converge. Similarly, (Dobson et al., 2003) found conditional convergence in LA and African countries, while less evidence was found in Asian countries during 1965-1995.

Sample and Period	Single Cross Section β [s.e]	R2	Panel Data β [s.e]
48 US states	0.017	0.89	0.022
1880-1990	[0.002]		[0.002]
47 Japanese prefectures	0.019	0.59	0.031
1955-1990	[0.004]		[0.004]
90 EU regions	0.015		0.018
1950-1990	[0.002]		[0.003]
11 German Regions	0.014	0.55	0.016
1950-1990	[0.005]		[0.006]
11 UK regions	0.03	0.61	0.029
1950-1990	[0.007]		[0.009]
21 French Regions	0.016	0.55	0.015
1950-1990	[0.004]		[0.003]
20 Italien regions	0.01	0.46	0.016
1950-1990	[0.003]		[0.003]
17 Spanish regions	0.023	0.63	0.019
1955-1987	[0.007]		[0.005]
10 Canadian provinces	0.024	0.29	
1961-1991	[0.008]		

Table 3.1: Previous studies of regional convergence. Taken from De la Fuente (2002).

Sample and Period	β [s.e]	R^2	Other variables
[1] 98 countries 1960-1985	-0.0037 [0.0018]	0.04	no
[2] 98 countries 1960-1985	0.0184 [0.0045]	0.52	yes
[3] OECD 1960-1985	0.0095 [0.0028]	0.45	no
[4] OECD 1960-1985	0.0203 [0.0068]	0.69	yes
[5] 48 US states 1963-1986	0.0218 [0.0053]	0.38	no
[6] 48 US states 1963-1986	0.0236 [0.0013]	0.61	yes

Table 3.2: Previous studies of convergence among countries and regions. Taken from De la Fuente (2002).

Study	Methodology	Obs	Result	Control Variables
Helliwell, Chung (1992)	Cross section regression/Graphs	18 countries (1960-1985)	Conditional convergence	Investments, population growth, human capital, scale effects
Dobson, Goddard and Ramlogan (2003)	Unit root with panel data	24 countries (1965-1995)	Conditional convergence	
Blyde (2005)	Panel data / distribution dynamics / inequality measures	88 Regions from MERCOSUR (1990-2000)	Conditional convergence / 2 clubs / increased income dispersion	Country dummies
Madariaga, Montout and Ollivaud (2003)	Cross section segression	4 Countries of MERCOSUR (1985-2000)	Absolute and conditional convergence	Agglomeration variables (as GINI, distance to the capital, frontier information)
Holmes (2005)	Unit root analysis / principal components / cointegration analysis	16 Countries of LAIA CACM (1960-2000)	Strong convergence for LAIA but weak for CACM	
Astorga, Berges and Fitzgerald (2005)	Panel data / error correction model	6 Countries (1900-2000)	Conditional convergence	Life expectancy, Illiteracy rate, Investments, public spending, terms of trade, world demand, dummies for external shocks, industrialization, integration, governance
Elías, V (2001)	Dispersion graphs	7 Countries (1960-1995)	Sigma convergence	
Dobson and Ramlogan (2002)	Cross section regression / panel data	19 Countries (1960-1990)	Absolute and Conditional convergence	Sectorial composition, country dummies, population growth, savings, human capital
Utrera (1999)	Cross section regression / unit root tests / distribution dynamics	20 Countries (1950-1992)	Conditional convergence / divergence (through other methods)	Investments, human capital, public expediture, sectorial composition, life expectabct, child mortality
Dabus and Zinni (2005)	Panel data	23 Countries (1960-1998)	Absolute divergence, conditional convergence, no club convergence	Human capital, investments, population and income ranking
Blyde (2006)	Distribution dynamics	21 Countries (1960-2004)	2 clubs	

Table 3.3: Previous research about convergence in Latin America

From the remaining nine studies, three focused on economic integration processes in LA. They tried to evaluate integration efforts under three economic blocs: MERCOSUR (*Mercado Común del Sur* - Southern Common Market), LAIA (LA Integration Association), and MCCA (*Mercado Común Centroamericano*-Central American Common Market). Convergence was found in MERCOSUR and LAIA but not in MCCA. Moreover, (Blyde, 2005) found two clubs in MERCOSUR, one large club for low and low middle income countries and a small for rich income countries

The last six studies were devoted to studying convergence among LA countries. In general they analyze few years and/or small number of countries, focussing on the most developed in LA. All studies found conditional convergence in their results. Nevertheless each study analyzed different countries, periods and introduced different control variables.

The longest period study is for 100 years, by Astorga et al.(2005), but only for 6 countries, Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. They found a similar speed of absolute and conditional convergence, with panel data and error correction models, of around 1.4%.They choose these countries because the are the larger economies in terms of GDP and population. Similarly Elías (2001) analyzed 7 countries, the same countries as before plus Peru, for 45 years. Through graphs of the σ coefficient, the author found that there was convergence of GDP per capita, capital, labour and productivity. However, divergence was found when comparing the 7 countries with USA.

Studies with more countries but fewer years found convergence but with different interpretations. Dobson and Ramlogan (2002) and Utrera and Koroch (1998), analyzed convergence for 19 countries and 30 years, and 20 countries and 42 years respectively Both found absolute and conditional convergence at a speed of around 1% in all cases. On the other hand, Dabus and Zinni (2005) found both, absolute and conditional convergence, but at very high speeds mostly after adding the control variables. The authors argue that once controls are introduced and extremely high speeds of convergence are found, compared to absolute convergence, is a signal of divergence. The reason is that when controlling by many characteristics, an hypothetical speed of convergence is being calculated and the real

would be absolute convergence, when countries are compared with out any controls. So they conclude that convergence of any type is absent in LA. Finally, Blyde (2006) uses distributional dynamic approach and found that countries are converging into two groups; one large for low and low middle income countries and another small for rich income countries.

The number of studies of national convergence in LA countries is greater but usually concentrated in only few countries, such as in Argentina (Garrido, Marina, Sotelstek, 2002), (Utrera and Koroch, 1998), Brazil (Magalhaes, Hewings and Azzoni, 2005) (Azzoni et al., 2001), Mexico (Calderón, 2006), Chile (Serra et al., 2006) , Colombia (Cardenas and Ponton, 1995), and Peru (Serra et al., 2006). Typically, the speed of convergence found is around 2% as in Elías and Fuentes (2001), where they analyzed 34 regions in Argentina and Chile and in Marina (2001) for the Argentinean case. Azzoni et al.(2001) found a speed of less than 1% for Brazil, and, higher rates were found by Anriquez and Fuentes (2001) for the Chilean case and by Cardenas and Ponton (1995) for the Colombian (around 4%).

3.3 Summary

After an exhaustive revision of literature it can be concluded that a lot of studies have focused on national convergence cases rather than cross country studies. Moreover, the research is centered in industrialized countries rather than the developing countries. However among the world wide studies it seems a typical finding is a speed of convergence about 2%.

The scarce studies about convergence in LA, do not disentangle the different periods in the economic history and its association with convergence. Their results are quite diverse and not robust. They study either short periods or a small number of countries and the controls that are introduced to approximate the steady-state vary greatly.

As Durlauf and Quah (1999) concludes, the choice of the steady-state's proxies depends on the interest of the researcher and that can lead to wrong results. Therefore the interpretation of the results can be quite different. Plus, too many controls say less about what real convergence means.

Chapter 4

Methodology

The preceding chapters showed the theoretical background of convergence and the empirical application. This chapter presents and discusses the methodology to test convergence in LA in a historical context. The purpose of this chapter is to establish the methodology followed to obtain the results in chapter 5, together with its theoretical assumptions and possible obstacles.

The chapter contains five sections. The first describes the model specification. It examines the equation and the variables to be estimated in order to test for β and σ-convergence. The second details the source of the data, the sample of study, and the calculations done to solve some measurement errors. The third, discusses the way the grouping is done. The fourth, compares the pros and cons of the different econometric tools together with possible problems such as endogeneity, the presence cross-country heterogeneity and unbalanced panel data. Finally, the chapter ends with a summary of the methodology.

4.1 Model Specification

The analysis of convergence consists of estimating growth Equations to quantify the speed of convergence, β-convergence, and analyzing graphs of the GDP dispersion among countries during time, σ-convergence. The present analysis takes into account several periods and groups of countries within which convergence is tested. The argument of testing convergence in certain groups (and periods) is that inside each group, countries tend to have similar steady-states and initial conditions so that convergence is expected ex ante. This section introduces the main Equations to be estimated and section 4.4 explains in detail the estimation tools.

4.1.1 β- Convergence

The model specification follows from the univariate Equation(2.7) studied before, and it can be written as [1]:

$$\gamma_{it} = a - b \cdot \log\left[y_{0it}\right] + u_{it}, \tag{4.1}$$

for $i = 1....N$ and $t = 1....T$

where,

- γ_{it} is the average growth rate for country i, at period t, calculated by: $\gamma_{it} = (1/\tau) \cdot \log\left[y_{it}/y_{0it}\right])$, where τ is the number of years included in period t, y_{0it} is the initial and $y_{\tau it}$ is the last GDP per capita of period t;
- a is the intercept of the equation;
- b is the regressor coefficient, calculated as $b = \frac{(1-e^{-\beta\kappa})}{\kappa}$, where β is the speed of convergence (if $\beta > 0$) and $\kappa$the average length of τ for period t;
- u_{it} is the disturbance term and $u_{it} \sim N(0, \sigma_u)$.

Equation(4.1) is estimated using different methods. First, it is estimated as a **single cross section regression** ($t = 1$) by Nonlinear Least Squares (NLS) method, and the parameter estimated is β instead of b. Therefore, the equation estimated with NLS is:

$$\gamma_i = a - \frac{(1 - e^{-\beta\kappa})}{\kappa} \cdot \log\left[y_i\right] + u_i. \tag{4.2}$$

Later, Equation(4.1) is estimated through **panel data methods**. The fixed effect method (FE) allows the constant term a to vary with each country and be related to the regressor (called the unobserved effect). Therefore, the equation estimated under FE is:

$$\gamma_{it} = a_i - b \cdot \log\left[y_{0it}\right] + u_{it}. \tag{4.3}$$

[1] It is assumed that $y = \hat{y}$

The random effect method (RE) adds a country specific unobserved effect, a_i, to the error term that behaves like a usual error term as well (Greene, 1999), except that for each country there is one unique sample extraction that appears in the regression identically in each period. Therefore the equation estimated under RE is:

$$\gamma_{it} = a - b \cdot \log\left[y_{0it}\right] + \varepsilon_{it}, \tag{4.4}$$

where,

- ε_{it} is the error term and is represented as: $\varepsilon_{it} = u_{it} + a_i$;
- $\varepsilon_i \sim N(0, \sigma_\varepsilon)$;
- $a_i \sim N(0, \sigma_a)$.

Pooled OLS (POLS) is similar to Equation (4.4) but assumes that $a_i = 0$. Therefore POLS estimates:

$$\gamma_{it} = a - b \cdot \log\left[y_{0it}\right] + u_{it}. \tag{4.5}$$

All panel data methods report b instead of β. Thus, β. is calculated as:

$$\beta = -\frac{\ln(1 - b\kappa)}{\kappa}, \tag{4.6}$$

4.1.2 σ-Convergence

σ-convergence exists among a group of countries if the dispersion of their real GDP per capita levels tends to decrease over time:

$$\boldsymbol{\sigma}_t < \sigma_{0t}$$

where,

- $\boldsymbol{\sigma}_t$ is the standard deviation of $log(y_{\tau it})$ across countries during the last year of period t;

- σ_{0t} is the standard deviation of $log(y_{0it})$ across countries during the the first year of period t.

So by simply looking to the GDP per capita dispersion graphs it can be determined whether there was σ-convergence or divergence.

4.2 Data Description

The analysis covers 32 countries, listed in the appendix, for the period 1900-2005. The potential number of observations is 3.392, but because not all countries have complete data, the number of real observations is reduced to 2.183.

The main variable chosen is the GDP per capita measured in constant 1990 International (Geary-Khamis) dollars. This measure allows the comparison of standards of living of each country; it takes into account the purchasing power parity of currencies in each country and the international prices of commodities (Maddison, 2003).

The source of information is mainly from the Madison Data Base (M) (Maddison, 2003) updated with the World Bank Data Base (WB)(World Development Indicadors).

The World Bank GDP is measured in constant 2000 international dollars and is available from 1960 to 2005. Meanwhile the Madison GDP data is measured in constant 1990 international dollars and is available from 1900 to 2001 (earlier data is found for only few LA countries). So the M data base was updated with the WB data. The WB data base was transformed to terms of constant 1990 International Dollars, from 1990 to 2005, by a converter factor[2]

There were some cases where the treatment was slightly different. In the case of Cuba with the WB, the GDP available was in constant 2000 Local Currency. Here, the converter factor was calculated with that kind of data and kept constant for the year 2001. In the case of 10 small Caribbean countries, M had no data at all, the converter factor was taken

[2]The converter factor was calculated as the ratio of the GDP from the M data base to the GDP of the WB data base:
C(1990) = M (1990)/ W (1990).
The factor was calculated for each year and was kept constant.from 1995.

constant, for the year 1995, from another country that heavily influenced these economies and assumed to have a similar converter factor[3].

In addition, the data base went through one more transformation. In the type of regression to be estimated, Equation(4.1), it is important to avoid abnormal values and a solution is to use circa values, which are three year annual averages of the GDP per capita. From this data the dependent variables were calculated as the geometric annualized average growth of each period[4].

4.3 The Grouping

In order to answer the questions stated in the Introduction, this study, uses economic history facts to group countries into similar periods with similar characteristics, such that convergence is expected and consequently tested. This section explains the estimation methodology of Equation(4.1), from which β-convergence is tested for all groups.

The grouping is done by collecting countries that tended to follow similar economic patterns and were affected by the same external shocks. The point is that inside these groups, similar steady-states are expected. In order not to divide the groups in an arbitrary way, the analysis is based on Thorp (1998). From her analysis, this study substrates 3 important periods: 1900-1930, 1931-1974, and 1975-2005. Moreover in each period, two to three groups of countries are identified. Additionally, the four custom unions now existing in LA and the 8LA are also studied. Therefore, in total 18 groups are analyzed: collecting all LA countries's in each period composes 3 groups, 8LA in each period another 3, 2 groups for the first period, 2 groups for the second, 3 for the third period, 4 from the 4 custom unions since their inception and 1 for 8LA over all periods.

Groups have thus been formed by conditioning on having similar features. In each

[3]The converter factor from USA was taken for Antigua and Barbuda, and The Bahamas; from Great Britain for Barbados and Belize; from Haiti for Dominica St.Kitts and Nevis, St. Lucia, St.Vincent and the Grenadines; from Colombia to Guyana, and finally from Dominican Republic to Grenada.
The converter was taken constant for the year1995 and then multiplied by the World Bank data, which in most of the cases was available from 1975 to 2005.

[4]For the σ-convergence analysis the normal values were analyzed

group, absolute and conditional convergence are then tested. Testing convergence per group is convenient because it gives less demand on the limited data of the determinants of growth, mostly at the beginning of the 20th century. According to Sala-i-Martin (1996b), one should restrict the convergence study to a set of economies for which the assumption of similar steady-states is realistic because in this way the steady-state is hold constant.

Additionally, when dividing the analysis by groups that vary across time, one could refer to club convergence as well. Club convergence analysis points out that the initial conditions determine the club to which each country converges. In practice, one way to test the existence of club convergence is by setting certain threshold of the initial conditions, and if the initial conditions of certain economies are above the threshold they converge to one club and if they are below they converge to another (Chumacero, 2002). In the present analysis, something similar is done: the threshold is determined by economic shocks given in history. Since it is possible to look back to history it is easy to identify convergence clubs according to how each country responded to different economic shocks together with their internal characteristics. Countries that responded in a similar way could be in the same group. However, the most used technique to test for club convergence is Monte Carlo simulations or Sthochastic Kernel distributions, which is not done in the thesis.

4.4 Econometric Tools

As mentioned above, Equation(4.1) is estimated for several groups by single cross section and panel data regressions. On the one hand, single cross section regressions show a complete picture of each group and period. They can capture the long term convergence and its procedure is simple and straight forward. Panel data estimations instead divide the analysis into subperiods, which may capture short-term adjustments around the trend rather than long-term convergence, the existence of business cycles tends to bias upward the estimates of speeds of convergence. Moreover, panel data estimations rely on strong assumptions (Barro and Sala-i-Martin, 2004).

On the other hand, panel data regressions present advantages as well. Panel data meth-

ods can handle unobserved characteristics for each country, such as culture, traditions, institutions, etc. On the contrary, single cross section regression ignores these characteristics and can produce biased coefficients. Furthermore, the time variation that panel data introduces may produce robust results of convergence in the sense that it tests convergence in short spans of time and takes into account information for countries that may lack data for some years.

Consequently, both methods are used. The single cross section regression helps for the general view and the panel data goes into more details. Most importantly, when absolute convergence is found under both methods, it means that the results are robust. So it is a way of testing robustness of the estimations.

4.4.1 Single Cross Section Regressions

The single cross section regression (Equation 4.2) is estimated by NLS method instead of OLS for several reasons. First, when using NLS, different speeds of convergence can be directly compared across samples with different lengths without using transformations (as the parameter estimated is β and not b). Second, NLS is correct and the standard errors of the parameters are the right ones [5].

It is possible that countries disturbances are correlated (i.e. $E[u_i u_j] \neq 0$). Thus the estimations allow for this type of correlation by calculating the robust heteroskedastic standard errors.

The results could be biased and inconsistent if there were endogeneity problems, or in other words if the regressor (the initial condition of each period) was not **exogenous**. There are three potential sources of endogeneity: Omitted variables, measurement error and/or simultaneity (Wooldridge, 2002). Regarding omitted variables, since the grouping

[5] Eq.(4.2) can also be regressed by OLS on the following linear relation:

$$\gamma_i = a - (1-b) \cdot \log[y_i] + u_i,$$

where $1 - b = \frac{(1-e^{-\beta T})}{T}$

If $b < 0$ NLS in no longer correct. Therefore b should be postive, which is the case for the further estimations.

is done according to economic history and inside each group similar economies are gathered, a lot of controls are implicitly included. To illustrate this point lets take the first period, in which two groups of countries are identified: the mineral and the agricultural. Countries that are included in the mineral group, have been controlled implicitly by the mineral sector characteristics which, at that period and for those countries, are the most important determinants of growth. Moreover, the lag of GDP can be enough to capture all the dynamics needed to explain growth. It includes past growth rates, which means that past growth accounting variables and past growth sources variables are included[6].

Measurement error in the GDP per capita at the beginning of each period (the regressor) can be present due to poor calculations and they may be temporary. This problem is diminished by smoothening the data such that the temporal errors tend to disappear.

Finally, simultaneity is not possible because the average growth rate of a period of 30 years, for instance, cannot determine the initial conditions of that period, unless the growth rate of the period was expected 30 years before, which is not likely.

In conclusion, the NLS method is used without controls for the steady-state since the group of countries are assumed to have similar steady-states. So, the NLS estimations measure the **absolute β-convergence** within each group.

4.4.2 Panel Data Estimations

Panel data estimations allow for time variation and need special treatment of the data. In all cases the number of periods is lower than the number of countries, so the asymptotic properties of panel data estimators are fulfilled ($T < N$) (Wooldridge, 2002). Furthermore, the spans of time periods (of each t) are long enough to minimize the problem of capturing short-term adjustments around the trend rather than the long term convergence (in average 12 years). Additionally the regressions will allow for aggregate time effects.

The difference between RE and FE method depends on the assumptions on a_i in Equa-

[6] Growth accounting variables are the variables used to calculate the GDP, growth source variables are the determinants of growth (Barro and Sala-i-Martin, 2004).

tions 4.4 and 4.3 respectively. If the unobserved characteristic of each country, a_i, is uncorrelated with the initial condition of each period ($E(a_i \mid y_{0i}) = 0$), the RE method is better, and if it is correlated ($E(a_i \mid y_{0i}) \neq 0$), the FE method is the appropriate (this can be tested by the Hausman test).

Similar to single cross section regressions, panel data regressions rely on exogeneity of the regressor (the initial condition). The difference is that single cross section regressions rely on contemporaneous exogeneity while panel data rely on strict or sequential exogeneity [7]. Both, FE and RE methods, are based on strict exogeneity and POLS on sequential exogeneity. If any of the assumptions fail, the results can be biased and inconsistent.

In this case the regressor (the initial condition) is sequentially exogenous. The average growth rate of a period of 30 years (the dependent variable), for example, cannot determine the initial conditions of the same period, as explained above, or the initial conditions of past periods but it can determine the initial condition of the next period. Therefore POLS is appropriate.

The difference between POLS and RE is that the former discards information about the structure of the error term (a_i) if it turns out to exist and to be significant (Wooldridge, 2002). Fortunately this can be tested by the test introduced by Baltagi and Li (1990) which is an extended Breusch -Pagan test for unbalanced panels. Under the null σ_a is 0, so POLS is correct (the test is carried out during the estimations and the great majority show that POLS is better)

There is no difference between POLS and FE when the POLS estimations allow for serial correlation between units (using clusters) and country specific dummies are included in the regression. Equation(4.5) would look like:

$$\gamma_{it} = a + ca_i - b \cdot \log [y_{0it}] + u_{it}, \tag{4.7}$$

[7] Strict exogeneity exists when the error term is uncorrelated to the future, present and past values of the regressor (conditioned on the unobserved effects); sequential exogeneity when the error term is uncorrelated with present and past values of the regressor (so it is allowed to be correlated with the future values); and contemporaneous when the error term is uncorrelated with present values of the regressor.

where the estimated b and its standard error are the same as the ones estimated by FE.

Therefore, the estimation of Equation(4.5) is interpreted as **absolute β-convergence** and the estimation of (4.7) as **conditional β-convergence** since dummies for each country are included and they control specific country unobserved characteristics that do not vary over time, like geography location, institutions, culture, traditions, weather, and most importantly the steady-state of each country.

Unbalanced Panel Data

The available panel data for this analysis is not balanced; some countries do not present information for all years (usually the first years). This can be a problem if the reason of missing information is related to the error term, but when the reason is connected to the regressor, panel data estimators are still valid. Here, the reason of the absent data is due to the development of each country. At the beginning of the century, only strong economies had data (some countries were still colonies). Therefore, missing information is due to low levels of GDP at the beginning of each period (the regressor) and panel data estimators are valid.

4.5 Summary

This chapter has presented and discussed the methodology to test convergence in LA. The appropriate methodology consists of, firstly, grouping the countries according to their common characteristics of development, and then, testing convergence inside each group of countries. Absolute β-convergence will be estimated by cross section regression through NLS and by panel data through POLS. The difference between NLS and POLS is that POLS takes into account time varying information and doesn't exclude countries that lack of data while NLS . Therefore the speed of convergence with NLS is usually higher because it takes into account less countries and usually the countries that take into account are the ones that are richer, because that is why they have data. Conditional β-convergence will be estimated by panel data by controlling for specific unobserved characteristics of each

country. σ-convergence will be analyzed by graphs of the GDP per capita dispersion of each group.

Chapter 5

History and Evidence of Convergence in Latin America

This chapter analyzes the history and evidence of convergence in LA. The purpose of this chapter is to apply the methodology developed from the theoretical framework and link it to the most important historical facts and data of the LA countries to test for convergence.

The chapter starts with a general picture of the LA economic performance and its position compared to the most advanced economies especially to its neighbor United States. Then, the chapter illustrates the regional development performance and analyzes the evolution of convergence in 106 years among all LA countries and among the 8LA.

Later each of the three periods defined by common characteristics from the economic history is explained in detail. For each period, first, a short summary of the main characteristics and findings is presented. Second, the description of each period and groups of countries encountered in each period is explained . The idea is to clarify the reasons of why convergence could be expected in each group. Finally, the convergence results are presented.

The convergence results are grouped into the catching-up countries, σ-convergence and absolute and conditional convergence analysis. The catching-up countries analysis consists in looking to the data and identify the countries that catched up, those countries that were poor at the beginning of the period but that on average for the whole period, grew faster than the rich countries. The problem with this simple analysis is that it only takes into account countries that have complete information for the whole period. So this is done just for description. The σ and absolute β and conditional β-convergence analysis is done

	Period 1 1900-1930		Period 2 1931-1974		Period 3 1975-2005		Total 1900-2005	
	g	y	g	y	g	y	g	y
	s.d	*s.d*	*s.d*	*s.d*	*s.d*	*s.d*	*s.d*	*s.d*
LA	2.1%	1,790	1.8%	2,854	1.2%	4,744	1.6%	3,551
	0.076	*928*	*0.063*	*1855*	*0.049*	*3117*	*0.059*	*2673*
Japan	1.9%	1,532	3.8%	4,097	2.2%	17,355	2.8%	7,248
	0.049	*292*	*0.119*	*2917*	*0.017*	*3401*	*0.083*	*7117*
USA	1.8%	5,342	1.9%	10,460	2.0%	22,892	1.9%	12,647
	0.055	*755*	*0.074*	*3373*	*0.019*	*4025*	*0.057*	*7605*
OECD	1.5%	3,182	2.5%	5,727	2.1%	14,893	2.1%	8,142
	0.055	*1348*	*0.077*	*3434*	*0.031*	*6261*	*0.060*	*6481*
World	1.7%	2,469	2.2%	3,322	1.0%	5,826	1.6%	4,452
	0.063	*1451*	*0.065*	*4338*	*0.112*	*6239*	*0.092*	*5358*

Table 5.1: Average growth and GDP per capita for Latin America, Japan, USA, OECD and the World, per period. Where g is the average growth rate of GDP per capita per period, measured in %, and y is the average GDP per capita per period, measured in International $. *s.d* is the standard deviation for each variable.

by using the econometric tools explained in the previous chapter.

A similar analysis, but with less details, is done for the integration processes in LA. The most advanced integration processes are four custom unions that can also be interpreted as grouping by geography.

5.1 International Context

The average growth for 106 years (1900-2005) has been 1.6% for LA, 2.1% for the OECD countries and 1.6% for the World (See Table 5.1). The only LA country that grew more than the OECD countries, during 106 years, is Venezuela: 2.2%[1]. However, LA has experienced rapid growth rates, particularly during the first period, from 1900 to1930,when LAs average growth rate (2.1%), surpassed the OECD (1.5%), USA (1.8%), Japan (1.9%) and the Worlds(1.7%) growth rates (Table 5.1).

[1] Actually the highest average growth rates observed in the table is for St.Kitts and Nevis, followed by Puerto Rico and St.Vincent and the Grenadines. But they lack data for most of the years

The rapid LA growth during the first period was based on their high quantities of primary exports and capital inflows to the region. Nevertheless, the first period average growth rate was also characterized by its high volatility, exceeding the volatility of other regions and the world in general.

Later, in the second period, from 1931 to 1974, LA grew less, in average 1.8%, which was lower than the rest of the world (2.2%), Japan (3.8%), USA (1.9%) and the OECD countries (2.5%). Finally, during the last period, from 1975-2005, LAs growth rate was lower than ever (1.2%) and lower than the OECD, Japan and USA average growth rates yet slightly better than the worlds average growth rate (Table 5.1)

In comparison with the closest neighbor, USA, LA has performed badly. The average GDP per capita from LA for more than 100 years is equivalent to only 28% of the American GDP per capita during the same period and 12% of the American GDP per capita in 2005. The dispersion of the average GDP per capita of LA and the US has increased in 106 years. After the WWII started, LA and US diverged greatly and after the WWII ended the dispersion coefficient went down (Figure 5·1) but continued increasing later. Clearly during the last decades, LA lost ground with respect to USA, with the highest dispersion in 2005.

Nonetheless some LA countries have done better than the average. At the beginning of the century, Argentina and Uruguay were relatively high income countries and to a lower extent Chile (See Table 5.2). After 1930, almost all countries declined their position with exception of Mexico, Venezuela, Peru, Jamaica and Brazil. The latter grew a lot during the Brazilian miracle in the 60s and 70s. In this second period, Venezuela reached the highest position that a Latin country had reached due to its oil boom. Later, however, Venezuela fell in position drastically. The Caribbean countries are among the countries with the best position in the last period, especially The Bahamas and Trinidad and Tobago.

Country	Period 1 1900-1930	Period 2 1931-1974	Period 3 1975-2005	All Periods 1900-2005
arg	0.66	0.53	0.35	0.51
bhs	.	.	0.57	0.57
blz	.	.	0.14	0.14
bol	.	0.16	0.11	0.13
bra	0.16	0.19	0.23	0.19
brb	.	.	0.44	0.44
chl	0.46	0.40	0.31	0.39
col	0.23	0.23	0.21	0.22
cri	0.27	0.24	0.23	0.24
cub	0.24	0.19	0.12	0.16
dma	.	.	0.08	0.08
dom	.	0.11	0.12	0.12
ecu		0.18	0.18	0.18
grd	.	.	0.14	0.14
gtm	0.24	0.23	0.15	0.20
guy	.	.	0.14	0.14
hnd	0.22	0.14	0.08	0.13
hti	.	0.09	0.05	0.07
jam	0.11	0.20	0.16	0.18
kna	.	.	0.15	0.15
lca	.	.	0.09	0.09
mex	0.32	0.26	0.28	0.29
nic	0.22	0.19	0.09	0.15
pan	.	0.22	0.23	0.23
per	0.20	0.25	0.17	0.21
pri	.	0.33	0.46	0.40
pry	.	0.15	0.14	0.15
slv	0.16	0.15	0.11	0.14
tto	.	0.49	0.51	0.50
ury	0.55	0.45	0.30	0.44
vct	.	.	0.08	0.08
ven	0.23	0.67	0.41	0.47
LA	**0.33**	**0.27**	**0.21**	**0.25**
Japan	0.29	0.37	0.76	0.46
OECD	0.60	0.55		0.59

Table 5.2: Relative GDP per capita in relation to USA. Ratio of the average of the GDP per capita of each country to the average of the GDP per capita of USA.

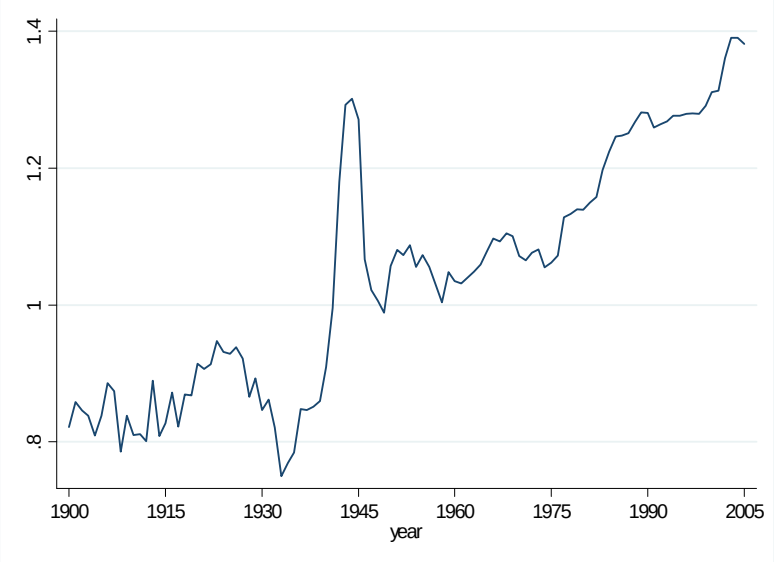

Figure 5·1: GDP per capita dispersion between Latin America and USA. Standard deviation between the LA average of the logarithm of the GDP per capita and the logarithm of the US GDP per capita.

5.2 Regional Context

LA has followed clear patterns along its economic history concerning their development efforts and their exposure to external shocks. The most important facts resulted into three periods of development. The division is characterized by a strong external shock, which made each period different to each other. The first period ranges from 1900 until 1930 - when the Great Depression whipped LA economies- and it is characterized by LA intensively exporting primary products. Therefore it is called *Export-led as Development Tool*. An inward-looking model was the response to the Great Depression, so the second period is called *Import Substitution Industrialization* which goes from 1931 to 1974 - when the oil crises occurred. Finally the third period, *Debt led growth, Structural Reforms and the Paradigm Shift* rages from 1975 to 2005, when LA experienced the debt crises of 1979 to 1980, responding with several "structural reforms". From these reforms and from an accumulation of several factors during history, the need for a change in development to one

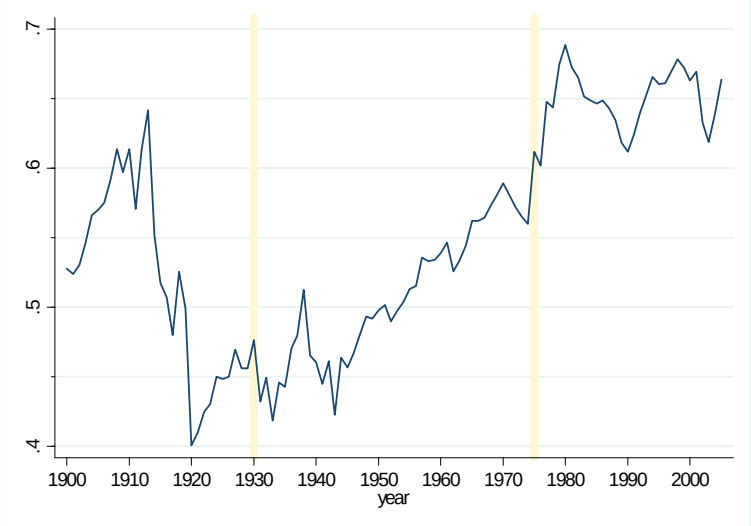

Figure 5·2: Sigma convergence among all Latin American countries per period. Standard deviation of the logarithm of GDP per capita among 32 countries.

with a more social outlook in a globalization context arose. This is called *The Paradigm Shift.*

5.2.1 σ-Convergence

The pattern of dispersion for all the LA countries and the 8LA economies has been quite different. In the historical division context it can be seen, from Fig 5·2 and 5·3, that while the first period exhibited a decreasing dispersion in GDP per capita among all LA countries, it was the one with the highest dispersion among the 8LA. Contrary, the last period had the highest dispersion for all LA countries but the lowest for the 8LA countries.

In this way, Figure 5·2 illustrates σ-convergence during the first period, σ-divergence during the second and σ-divergence or null during the last period for all LA countries. Similarly Figure 5·3 describes the σ pattern for the 8LA: σ-convergence is seen during 106 years. Periods 1 and 2 particularly show a clear decline in the dispersion and, although period 3 does not show the same decline, the level of dispersion is the lowest of all periods.

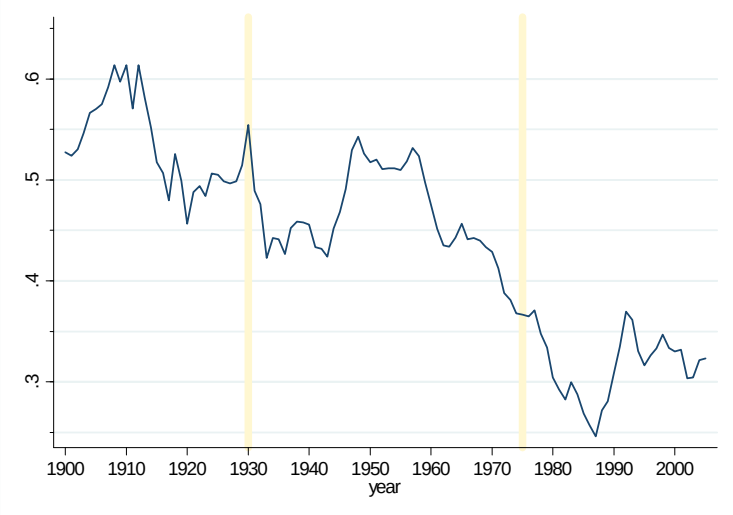

Figure 5·3: Sigma convergence among 8 Latin American countries per period. Standard deviation of the logarithm of GDP per capita. The 8 Latin American countries are: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay and Venzuela.

5.2.2 Absolute and Conditional β-Convergence

All Latin American countries

The results of the estimations of absolute and conditional β-convergence are shown in Table 5.3. The first period estimations include 13 countries, the second 23 and the last period 32. The first column illustrate the results of the NLS estimation of Equation(4.2) and although the spans of time and number of countries are different, the results can be directly compared. The only period when countries converged in an absolute way was the first period, at a speed of 1%. The second and third period exhibit divergence.

The second and third column of Table 5.3 show the panel data estimations, which have been controlled by time effects[2] of the absolute and conditional β-convergence from Equation(4.5) and (4.7) respectively. Clearly the adjustment of the data improves when the country specific effects are added (see the R^2). The results cannot be compared directly so

[2]Since the division of subperiods for the panel data is done arbtirarily, the estimations for absolute convergence are controlled by time-dummies.

they are converted through Equation(4.6) to yield an estimate of the speed of convergence β and presented in Table 5.4.

The results show absolute β-convergence for the first and the third period at speeds of 0.5% and 0.7%[3], but the second period show absolute divergence. After taking into account each countries specific characteristics, conditional β-convergence is found for the second and the third periods but not for the first. The speed of conditional β-convergence for the second and the third was around 6%.

The absolute speeds of β-convergence are higher with NLS than with Panel data because, as said in section 4.4, the NLS estimation excludes time varying information and countries that lack of data for the first years of each period. The point of estimating through both methods is to check for robustness. In this case, the period less robust is the third but still absolute β-convergence is found with panel data, and that is the result the thesis relies on more.

Preliminary Conjectures From the results some conjectures can be drawn. The fact that during the first period, the export growth phase, there was absolute and not conditional β-convergence, means that countries were converging due to common external factors rather than their own characteristics. Once each country's non time varying characteristics are controlled for, the LA countries diverged.

During the second period of industrialization countries diverged in an absolute way but converged conditionally. The reason may be that during the second period countries went on their own way of development by industrializing or not, such that each country's own experience was more important in determining convergence than the external common factors as it was for the first period. Therefore once each country specific characteristics are controlled for, they converged.

Lastly, during the third period, countries converged in an absolute and conditional sense, meaning that common external factors were determining the path, like the debt

[3]The κ is 9 years for the first period, 6 for the second and 7 for the third.

crises, but also that each country's own experience was important for convergence, such as the link with the paradigm shift of each country.

These are only preliminary conjectures. More links between the convergence results and historical events are introduced in the following sections, were each period is carefully analyzed.

8LA

Regarding the 8LA countries, it can be seen that during 106 years the 8LA converged, in an absolute sense, at a speed of around 1%.(0.9% with single cross section and 1% with panel data) and conditionally at a speed of 2.4% (see Table 5.4). According to the NLS results, the 8LA converged most during the third period, at a rate of 3.3% (in an absolute way), which is confirmed by the Panel data regression (but at a rate of 1.8%). The 8LA also converged conditionally at speeds of 5.2% during the first period, 4.4% during the second and 3.7% during the third.

Preliminary Conjectures As a preliminary conjecture, it can be said that the fact that in all periods, 8LA converged in an absolute and conditional way suggests that both country characteristics and external factors helped to shape this pattern.

5.3 First Period (1900-1930): Export-led as Development Tool

The first period starts in 1900 and ends with the Great Depression crises of 1929-1930. The main characteristics of the LA countries in this period is that their development was owed to their exports of primary products. The groups of countries detected in this period are two: the agricultural group, composed by countries that were specialized in exporting agricultural products, and the mineral group, composed by countries that exported mineral products.

σ-convergence was found for the whole period and for each of the two groups, showing that the distribution of income inside each group and in general, has changed to be less

disperse. absolute β-convergence was found for the whole period and for the mineral countries, while conditional β-convergence was found only for the agricultural countries.

The presence of absolute β-convergence and the absence of conditional β-convergence, as it is found for the whole period and for the mineral countries, imply that countries converged due to external common factors rather than country-specific factors. On the contrary, the agricultural countries converged only after controlling by each country characteristics, implying that the agricultural countries are quite heteronegous.

Since for the whole period and for each group, absolute and σ-convergence were not found simultaneously, it can be said that countries did not really have a common steady-state, although, during period one and for the mineral group, countries converged. The reasons for the observed absolute β-convergence, are several. First, period one converged due to the strong convergence of the mineral countries. Second, mineral countries converged, because WWI benefited them. Finally, the poorest of the mineral group, Venezuela, experienced impressive growth rates because they discovered oil.

5.3.1 Description of the period

During the first period, the world export demand was high and the capital flows were fluent. These two facts determined the way LA developed. The economic growth of the industrial "center" (the developed countries) increased their demand of primary products (raw material), which was available in LA. LA exported the needed primary products without any aggregate value and at the same time, LA imported more elaborated goods produced in the "center" (Thorp, 1998).

The main source of income for LA countries was from their exports. So countries development was dependent on their export market and export goods characteristics. Countries were extremely vulnerable to world income and to fluctuations in primary products prices, since their exports were concentrated in either agricultural or mineral products. The type of goods produced was a determining factor in each country's development.

Agricultural production was vulnerable to natural disasters and minerals were vulner-

able to recessions in the "center", because minerals were used in construction, machinery, and chemicals production. Moreover, both types of production had different spillovers. For instance, the mining sector was characterized by using less land and less labor, it needed more capital and technological intensity and had different transport needs than the agricultural sector. Therefore, the kind of product determined in some way the "club" to which countries were converging.

WWI (1914-1918) accelerated the shift in trade and investment structures in LA. The demand for LA's exports increased and according to Furtado (1981), the war stimulated the industrial growth in LA, especially in the mineral countries. After WWI the growth rates were higher for the mineral countries (4% for the period 1920-1924 and 5% for the period 1925-1929, see Table B.4 in the appendix) than the agricultural countries. (2% for the period 1920-1929, see Table B.3 in the appendix).

On average the growth rate for the first period was 2,1%, which was mainly due to the high growth rate of the mineral countries. The mineral countries grew on average 2,4% while the agricultural 1,7%. However, the agricultural countries had a higher average GDP per capita: 1,934 International $ compared to 1,638 $.

5.3.2 Description of the Groups

Agricultural

The agricultural countries were the following eleven: Brazil, Colombia, El Salvador, Nicaragua, Costa Rica, Guatemala, Honduras, Ecuador, Cuba, Argentina and Uruguay. They were mainly producing coffee, bananas, cacao, sugar meat and/or wheat.

Those mainly producing coffee were Brazil[4], Colombia[5], El Salvador and Nicaragua. Brazil and Colombia were the leaders in coffee, and according to Thorp, Colombias quality of coffee was better than the Brazilians because it was produced by many small producers.

Costa Rica and Guatemala were mainly producing coffee and bananas while Honduras

[4]Brazil was also producing rubber before 1900 but later coffee dominated more and brought higher growth rates, railroad expansion, and development of other sectors (Thorp, 1998)

[5]Colombia also produced gold (Antioquia region) besides coffee.

was producing bananas and precious metals. In general Central American countries experienced higher production of bananas after the American multinational company, United Fruit, came to the region (in the 1920s and 1930s).

Cuba produced mainly sugar but also tobacco. Sugar is a more elaborated product than raw material, it requires a process to convert sugar cane into sugar. Therefore, investment in physical capital is needed and this is reflected in Cubas GDP per capita. The only available data is for one year: 1929, and by comparing to the others, show that Cuba was among the 5 richest of the agricultural countries in that year (see Table B.3).

Argentina and Uruguay were mainly producing meat and wheat. Both were characterized by having received a lot of immigrants that established in their countries (in other countries, immigrants did not stay). Argentina was the richest of all countries in GDP per capita terms and Uruguay was the second rich (see Table B.3). Argentina had a lot of infrastructure. They constructed railways, ports and was one of the countries with most trade affluence. Uruguay experienced the benefits of being close to Argentina. Both Argentina and Uruguay had similar patterns of growth.

Mineral

The mineral countries numbered four: Chile, Mexico, Peru and Venezuela. They exported mainly petroleum and copper. Petroleum was produced by all except by Chile, and copper was produced by all except by Venezuela. Before 1917, Venezuela was mainly producing coffee and cacao, but after that year petroleum became the most important source of revenue. Mexico was the most diversified export country in LA. They also exported, lead, zinc, silver, gold, coffee, rubber and cotton. They discovered its oil in 1910. Chile and Mexico were the richest after Argentina and Uruguay.

The mineral countries were more volatile than the agricultural. For instance, Peru experienced the highest yearly growth rate (in 1916 it grew at 24%) and the lowest as well (in 1921-36%). Venezuela had the lowest GDP per capita of the mineral countries in 1907 (793 International $, and the highest in 1929: 3,426 $

5.3.3 Convergence Results

Catching-up Countries

According to theory, if poor countries, at the beginning of a period, are growing at faster rates than the rich during the period, they are catching up. So, by simply looking to data it can be identified which countries catched up. The problem with this simple analysis is that it only takes into account countries that have complete information. for the whole period. So this analysis objective is only for terms of description.

Period 1 From the countries where data is available for the whole period, those growing the fastest in average, were Venezuela (4.9%) and Peru (2.4%) and the poorest countries at the beginning of the period, in 1900, were Brazil (678 $) and Peru (817 $). Therefore the country catching up during the first period was Peru.

Mineral From the mineral countries, the poorest country, besides Peru was Venezuela (821 $), and Venezuela was also the one growing the fastest. Therefore, the country catching up the most was Venezuela.

Agricultural From the agricultural countries group, the ones with fastest growth rates were Uruguay (1.9%) and Brazil (1.8%) and the countries with the lowest GDP per capita in 1900 besides Brazil was Colombia (973 $). So Brazil was the country catching up.

σ-convergence

Period 1 The GDP per capita dispersion fell in Period 1 (Figure 5·4), mainly after WWI started (1914). The high degrees of dispersion observed at the beginning seem to come from the high dispersion degrees experienced by the agricultural group. The agricultural countries started with a higher GDP per capita dispersion but ended with a similar dispersion level as the mineral countries. So the agricultural countries experienced a more drastic σ-convergence than the mineral countries, which is reflected in period 1s σ-convergence.

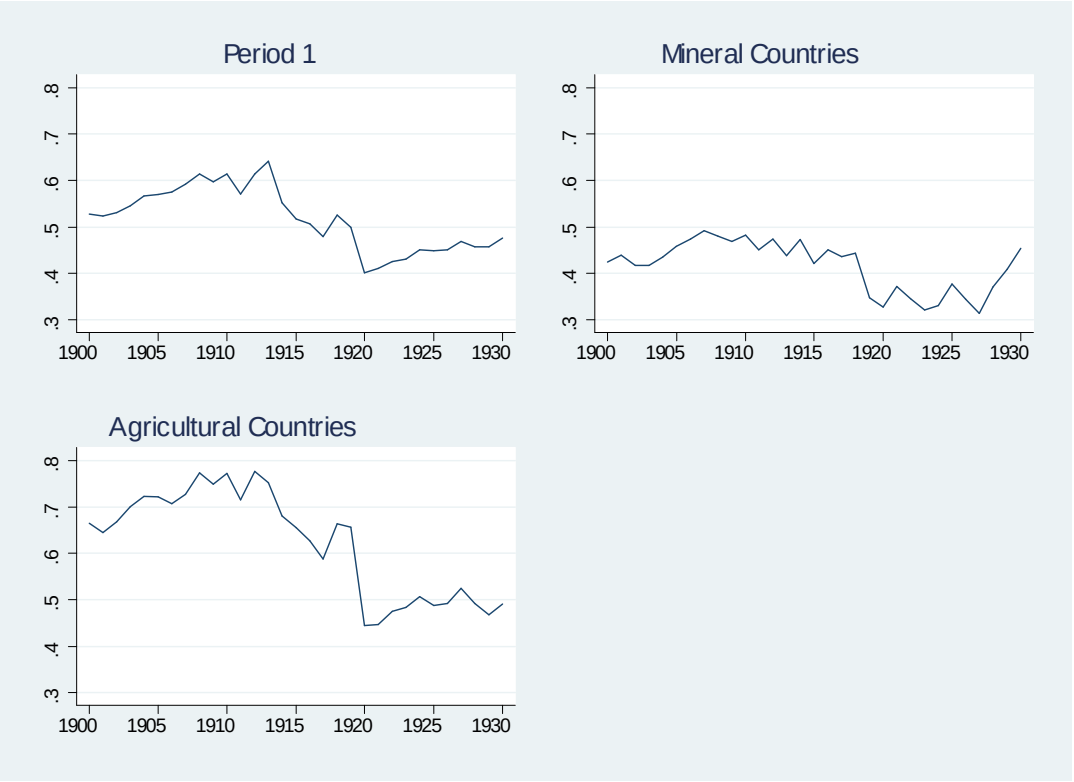

Figure 5·4: Sigma convergence in period 1, mineral and agricultural groups. Standard deviation of the logarithm of GDP per capita among countries in each group.

Agricultural Looking in detail, the agricultural group showed an increasing divergence until around 1910 (see Figure 5·4), then the dispersion decreased reaching the lowest dispersion coefficient around 1920 and from there the dispersion was kept constant. The reason is that Argentina and Uruguay were growing very fast until around 1910 (see Table B.3) so that the gap from the rich and poor was big. Later, Argentina and Uruguay went into a deep recession, from 1910-1914 Argentina and Uruguay experienced a negative growth rate of -2% in average, and Brazil did very well, from 1915-1919 it experienced a growth rate of 3%. After 1920 Argentina recovered and the gap increased slightly and kept constant until the end of the period.

Mineral The mineral group experienced the highest levels of dispersion among its countries around 1907 and the lowest 20 years later (around 1927). During the first 5 years of the period all mineral countries were growing at a rate around 2%, and they continued to do so during the next five years. The exception was Venezuela, which grew at negative growth rates, thus widening the gap with the richest. Later, Venezuela discovered its oil and grew very fast, from 1920 to 1929 its growth rate was around 12%.

Absolute and conditional β-convergence

The first column of table 5.3 show the NLS estimation for absolute β-convergence, where the whole period has converged at 1%, the mineral group converged at a fast speed of 5.6% and the agricultural countries diverged. The second and third columns illustrate the absolute and conditional β-convergence results with panel data. The speed of convergence under panel data is in Table 5.4[6]. The whole period converged in an absolute way at a rate of 0,5% and diverged after conditioning by country characteristics. The mineral countries converged only in an absolute way at a rate of 3.2% while the agricultural countries converged only in a conditional way at a rate of 4.5%.

The absolute speeds of convergence are higher with NLS than with Panel data because,

[6]The value of κ is 9 for the mineral group and 14 for the agricultural group

Groups of countries		Single cross section		Panel data			
		Absolute		Absolute		Conditional	
		β [s.e.]	R^2	b [s.e.]	R^2	b [s.e.]	R^2
All periods	8 LA	0.0088 [0.0042]	0.62	0.0112 [0.0031]	0.31	0.0286 [0.0058]	0.46
Period 1 1900-1930		0.0097 [0.0115]	0.12	0.0048 [0.0089]	0.08	-0.0916 [0.3425]	0.62
	8 LA	0.0097 [0.0115]	0.12	0.0081 [0.0098]	0.19	0.0736 [0.0774]	0.57
	Agricultural (9)	-0.0016 [0.0029]	0.11	-0.0050 [0.0044]	0.23	0.0639 [0.1478]	0.88
	Mineral (4)	0.0564 [0.1287]	0.40	0.0377 [0.0335]	0.28	-0.0930 [0.375]	0.59
Period 2 1931-1974		-0.0027 [0.0054]	0.01	-0.0011 [0.0046]	0.09	0.0778 [0.0125]	0.56
	8 LA	0.0121 [0.0082]	0.35	0.0086 [0.0056]	0.18	0.0553 [0.0177]	0.53
	Industrialized (6)	0.0198 [0.0099]	0.71	0.0147 [0.0047]	0.32	0.0059 [0.0369]	0.13
	Non-Industriliz (17)	-0.0107 [0.0040]	0.13	-0.0067 [0.0046]	0.09	0.0853 [0.0134]	0.60
Period 3 1975-2005		-0.0098 [0.0051]	0.16	0.0074 [0.0058]	0.01	0.0777 [0.0135]	0.67
	8 LA	0.0328 [0.0212]	0.37	0.0207 [0.0091]	0.34	0.0490 [0.0334]	0.88
	Good Institutions (7)	0.0296 [0.0206]	0.28	0.0219 [0.0130]	0.28	0.0477 [0.0489]	0.81
	Painful (9)	0.0087 [0.0022]	0.14	0.0074 [0.0054]	0.14	0.0756 [0.0234]	0.80
	Vulnerable (16)	-0.0199 [0.0053]	0.54	0.0005 [0.0068]	0.04	0.0767 [0.0308]	0.61
Regional Blocs							
1960-2005	MCCA (5)	-0.01051 [0.0087]	0.13	-0.01769 [0.0109]	0.38	-0.01347 [0.0430]	0.86
1969-2005	CAN (4)	0.00367 [0.0234]	0.01	0.00107 [0.0103]	0.00	0.05056 [0.0222]	0.94
1975-2005	CARICOM (12)	-0.02042 [0.0054]	0.55	0.00194 [0.0075]	0.05	0.07496 [0.0332]	0.64
1986-2005	MERCOSUR (5)	-0.00378 [0.0090]	0.05	-0.00373 [0.0089]	0.25	0.07694 [0.0729]	0.80

Table 5.3: Convergence estimations. The constant term and the country-specific effects are not presented here. The single cross section estimations come from Eq. (4.2). The panel data estimations come from Eq. (4.5) for absolute convergence and from Eq. (4.7) for conditional convergence. Panel data estimations are controlled by time-effects. Positive values of B and b mean convergence, and negative divergence.

as said in section 4.4, the NLS estimation excludes time varying information and countries that lack of data for the first year of the period. The point of estimating through both methods is to check for robustness. In this case, the groups of countries that experienced absolute β-convergence are confirmed by both methods and are, therefore, robust.

The presence of absolute and not of conditional β-convergence, as it is found for the whole period and for the mineral countries, imply that countries converged due to external common factors rather than country-specific factors. On the contrary, the agricultural countries converged only after controlling by each country characteristics, implying that the agricultural countries are quite heterogenous and to measure convergence it is necessary to control by each country characteristics.

Since for the whole period and for each group, absolute and σ-convergence were not found simultaneously, it can be said that countries did not have the same steady-state, although during period one and the mineral group, countries converged. The reasons for the observed absolute β-convergence are several. First, period one converged due to the strong convergence of the mineral countries. Second, mineral countries converged, because WWI benefited the whole group. Finally, Venezuela discovered oil.

Therefore, the conjecture made in the previous section 5.2.2 about the first period can be accepted. The conjecture was that countries were converging due to common external factors rather than their own characteristics. This is also the case for the mineral but not for the agricultural groups. So, the division of groups helped to detect the group that was leading to the general results of period 1.

5.4 Second Period (1931-1974): Import Substitution Industrialization

The second period starts after the US stock market crash of 1929 that lead to the Great Depression and ends with the Oil Crises of 1974. The LA countries, in this period, were characterized by applying an inward-looking model of development that consisted in substituting imports and since imports where characterized by being highly industrialized, LA went into a process of industrialization. The groups of countries detected inside the

Groups of countries		Single cross section regression	Panel Data	
		Absolute	Absolute	Conditional
All periods	8 LA	0.88%	1.04%	2.40%
Period 1 1900-1930		0.97%	0.47%	-19.32%
	8 LA	0.97%	0.77%	5.16%
	Agricultural (9)	-0.16%	-0.52%	4.52%
	Mineral (4)	5.64%	3.25%	-20.14%
Period 2 1931-1974		-0.27%	-0.11%	6.33%
	8 LA	1.21%	0.82%	4.40%
	Industrialized (6)	1.98%	1.37%	0.57%
	Non-Industriliz (17)	-1.07%	-0.69%	6.82%
Period 3 1975-2005		-0.98%	0.72%	6.25%
	8 LA	3.28%	1.81%	3.70%
	Good Institutions (7)	2.96%	1.90%	3.62%
	Painfull (9)	0.87%	0.72%	5.73%
	Vulnerable (16)	-1.99%	0.05%	6.18%
Regional Blocs				
1960-2005	CACM (5)	-1.05%	-2.23%	-1.59%
1969-2005	CAN (4)	0.37%	0.11%	3.62%
1975-2005	CARICOM (12)	-2.04%	0.19%	6.07%
1986-2005	MERCOSUR (5)	-0.38%	-0.38%	5.85%

Table 5.4: Speeds of Convergence. Calculated from Table 5.3 and Equation 4.6.

period, are two, the industrializers and non-industrializers. As their name indicates, the industrilizers were able to industrialize while the others failed to do it.

Regarding convergence, σ and absolute β-convergence was only found for the industrializers group and conditional β-convergence was found for the whole period and for each of the two groups. The presence of conditional β-convergence and the absence of absolute β-convergence means that countries did not share a steady-state and convergence only occurred after each country unobserved characteristics are controlled for. This is the case for the whole period and for the non-industrializers.

On the contrary, the industrializers had the same steady-state. With or without controlling for each country specific unobserved characteristics, the industrializers converged. The reason of their convergence is due to the industrialization process. They were able to succeed, despite all the distortions that the ISI brought, in innovating some industries making the technology transmission to be more fluent.

5.4.1 Description of the period

The Great Depression brought a change in prices and henceforth a change in demand from LA and the rest of the world. The Great Depression provoked a fall in economic activity in the industrialized countries, which in turn reduced their demand for primary products and reversed the capital inflows to LA. This situation deteriorated the terms of trade of all primary products[7], leading to an increase of the LA real import prices. The natural mechanism would suggest a decrease in real export prices which should have stimulated the demand again, but due to the extreme circumstances of the Great Depression, world demand could not recover. Instead, the LA countries demand shifted from imported (manufactured) goods to domestic manufactured products, because the former were expensive

This process stimulated the import substitution phase of LA. As detailed by Thorp

[7]The terms of trade of primary products (ToT_{PP}) is the ratio of the export price of primary products (XP_{PP}) and import price of manufacturated products (MP_{MP}):
$ToT_{PP} = \frac{XP_{PP}}{MP_{MP}}$
So when the demand for primary products decreased their prices went down and deteriorated the ToT_{PP}.

"..it was risky to rely for growth on traditional primary commodity exports and on the importing of most goods vital for expansion...there was a consensus around the need for industrialization". Therefore, the Great Depression pushed many LA countries into a process of import substitution strategy by default (Cardoso and Helwege, 1992).

The process of industrialization via import substitution was reinforced by the WWII (1939-1945). Although the WWII brought an increase of LA exports, there were constraints on LA imports. Consequently, the scarcity of imports and the deterioration of the terms of trade of primary products encouraged new efforts to substitute imports but these efforts were limited in turn by scarcity of imported inputs and capital goods (Thorp, 1998). Additionally the consensus on the importance of industrialization via Import Substitution (ISI) found theoretical and institutional support in the United Nations Economic Commission for Latin America (ECLA).

Ideology of ISI

The ideology of ISI was based mainly in 6 arguments (Cardoso and Helwege, 1992).

1. *Volatility of primary product prices*. The primary product markets were unstable and the concentration of exports on this sector was extremely risky. Agricultural products were too dependent on natural conditions (they were exposed to natural disasters) and mineral products were too sensitive to recessions in industrialized countries (minerals, such as copper, were used in construction and in new equipment), and this was worsened by speculative stockpiling.

2. *Declining terms of trade* (commodity good prices < manufactured good prices). The elasticity of income demand was higher for primary products than manufactured products (primary products were too sensitive to income changes). So after the Great Depression and WWII, commodity prices decreased more than manufactured. On the other hand the manufactured goods prices from the industrialized countries included profits from innovation, making their prices higher than the primary products. Moreover, technological progress on manufactured goods led to higher salaries rather than lower prices. Produc-

tivity gains from technology innovation in primary products, on the other hand, were not translated into higher salaries, because there was unemployment, but translated to a reduction on prices. Therefore increases in productivity in the traditional primary sectors, benefited overseas consumers rather than producers.

3. *Dynamics of natural resources.* The LA countries were characterized by being abundant in natural resources and labor but not in capital. Yet capital still needed to be accumulated to increase profits from natural resources. Therefore it was necessary to attract investments and capital to the region by government intervention.

4. *Infant industry.* With the help of the government, new enterprises would be created, which would gain experience in new sectors and become competitive.

5. *Spillovers from industry.* Industrialization would bring spillovers and would create other industries with assistance from the government.

6. *Elasticity pessimism.* The argument was that the ISI would alleviate the balance of payment deficit by reducing imports. There was a belief that real devaluations would have little effect on exports. Besides, exports experienced barriers in foreign countries.

The implementation of ISI

The ISI was implemented by national governments and consisted in promoting industries and restricting imports.

The governments in general promoted all kind of "industries", rather than a selection of strategic sectors. The way to promote new industries, usually managed by the public sector, was by lowering interest rates, giving easy credits and controlling prices. Capital inflows were attracted through loans to the public sector and in some cases Transnational Companies worked together with the governments and their repatriation of profits was limited.

Regarding imports, essential goods were allowed (food, capital goods, and intermediate good), but there was a limit on imports of final goods. This was done by having different policies for each type of imported goods. Governments applied multiple exchange rates,

protective tariffs, import licenses and different import quotas that could favor the essential goods imports and reduce final goods imports.

The results of ISI

As a result of the protection of the national markets, some problems arose. The exporting sector was discouraged because in order to produce, they were forced to buy high cost domestic intermediate products, and the restriction of the imports demand overvalued the exchange rates[8], making their prices less competitive. Moreover, fiscal revenues from the commodity product sector went down and the public spending rose, creating a fiscal gap, which in some cases was monetized and later created persistent inflation. The ISI was detrimental for sectors that were not intensive in capital like the agricultural sectors and the artisans. This fact forced people to move from rural areas to urban, creating a larger urban informal sector. Finally, the low interest rates given by the government to promote investments discouraged saving whilst helping inefficient firms, and corruption increased greatly.

On the other hand, there were positive aspects of the ISI. For those countries where industrialization was strong, innovations were made in terms of organization, technology and R&D (together with investment in education) like in Brazil, Argentina and Mexico. Another positive side was that some enterprises were ready to export. Overall, more manufactured goods were produced.

5.4.2 Description of Groups

Industrializers

The industrializers were six countries: Argentina, Brazil, Chile, Colombia, Mexico and Uruguay. Only these few countries succeeded in getting capital goods and creating intermediate input industries, but still had some problems.

[8]The Real exchange rate (R) of a LAC currency is: $R = \frac{p^*}{p} \cdot e$, where e is the exchange rate of a LAC currency in terms of other currency, $p^*$is the international prices and p is the national prices. With import restrictions, national prices rose, and since LAC countries didn't adjuste their exchange rates, it resulted in a overvaluation of their currencies, which in turn damaged the export sector.

Due to their larger domestic markets, Brazil and Mexico managed better than the other countries in the region. Both created successfully automobile industries. In fact, Brazil experienced the highest growth rates and went through a process of high persistent growth rates, called the "Brazilian Miracle", from 1970-1974 Brazil grew at 7%, see Table B.5).

Efficient steel production was established in Argentina and Brazil. Chile had political and social structure problems but still promoted the production (and export) of forestry, fishing, mining and engineering sectors. In 1960 Chile tried to produce automobiles but failed due to its small market size. Colombia industrialized its coffee and was the only country without an overvaluation, inflation or high levels of debt, but problems of violence during the 40s and 50s affected the industrialization process. Finally, Uruguay, was already industrialized by 1945 but in mid-1950 they went under stagnation.

Non - Industrializers

The non-industrializers are the countries that failed to industrialize. In total they are seventeen countries: Ecuador, El Salvador, Guatemala, Nicaragua, Peru, Venezuela, Paraguay, Bolivia, Costa Rica, Honduras, Dominican Republic, Haiti, Panama, Jamaica, Puerto Rico, Trinidad and Tobago and Cuba.

The reasons for these countries not to industrialize were diverse. Some stayed as primary exporters because of their strong dominating primary export sector, which in the majority of the cases was overprotected by the government, or because the government created inefficient industrial sectors that were not able to succeed. Others were based on different models as Cuba that was based in a centrally planned model and the Caribbeans that were based on a model of promotion of exports and industrialization by invitation.

The primary exporters were eight: Ecuador, El Salvador, Guatemala, Nicaragua, Peru, Venezuela, Paraguay and Bolivia. These countries were characterized by having a strong primary export sector that dominated attempts to industrialize. On the continent, Venezuela, Peru, Bolivia, Ecuador and Paraguay were not well prepared for industrialization, with Bolivia and Paraguay the worst cases in terms of results. Further north, El Salvador,

Guatemala and Nicaragua concentrated on the export of cotton.

Bolivia's strong and powerful tin sector took advantage of a weak state to concentrate resources[9]. After the revolution in 1952 the tin sector was nationalized and the government had immense difficulties managing it (the growth rate from 1955-1959 was -3%, see table B.7) and lastly in the 60s some investment went to mining and petroleum sectors (the growth rate from 1960 to 1969 recovered to 3%). Paraguay was dominated by a few families, protected by the military regime of Stroessner, that were producing the traditional goods (meat and tobacco), making it hard to change economic structures. Paraguayans experienced negative growth rates for 15 years (in five-year periods) from 1940 to 1954, on average -2%.

Venezuela, attempted to industrialize late and the result was the creation of an inefficient industrial sector with strong rent seeking characteristics, which brought a lot of distortions (Thorp, 1998). The Venezuelan economy was highly dependent on its oil with characteristics of Dutch Disease.

Ecuadors protectionism carried out in the 60s only benefited the traditional elite groups and failed to industrialize the economy. Peru had good export prospects, so industrialization through import substitution was low.

El Salvador, Guatemala and Nicaragua concentrated their efforts in the cotton sector, which required moving peasants from their own lands, making them worse off (Williams, 1986). During this period Guatemala and Nicaragua grew at 1.4% and El Salvador at 1.9%. All three countries had very low levels of GDP per capita, especially El Salvador and Honduras. In fact, El Salvador had the lowest GDP per capita from all LA countries.

Based on a model of central planning, Cuba tried to diversify their sugar-concentrated economy to corn, rice, cotton, tomatoes and soybeans but the lack of skilled labor and shortages of materials pushed them back to the production of sugar again.

The countries under the export promotion and industrializing by invitation were the Caribbean. Headed by Puerto Rico, the Caribbean tried to search for different markets

[9] A lot of the debt was directed to pay expensive railroads for the sector

than sugar. They gave concessions to foreign firms but employment was not created and by the 60s foreign firms left. However some of the countries experienced high levels of growth. From 1950, when data starts being available for almost all Caribbean, to 1975, Puerto Rico grew at 5%, Trinidad and Tobago at 4% and Dominican Republic at 3%. They show high levels of GDP per capita mainly due to their small size.

5.4.3 Convergence Results

Catching-up Countries

Period 2 From the countries where data is available for the whole period, those growing the fastest in average, were Brazil (2.8%) and Mexico and Venezuela (2.5% each) and the poorest countries at the beginning of the period, in 1931, were El Salvador (924 $) and Brazil (1004$). Therefore the country catching up during the second period was Brazil.

Industrializers From the industrializers, the poorest country, besides Brazil was Colombia (1,448 $) and fastest growing countries were Brazil and Mexico. Therefore, the country catching up the most was Brazil.

Non-Industrializers From the non-industrializers group, the countries with fastest growth rates besides Venezuela were Costa Rica (2.3%) and Peru (2.1%) and the countries with the lowest GDP per capita in 1931 besides El Salvador was Peru[10] (1,228$). Therefore the country that catched up was Peru.

However, these results are not reflecting all the countries information. A lot of countries that lack data for the first years but have information for the majority of the years are ignored in this analysis. This is solved by analyzing the other convergence concepts

[10] Probably Honduras, Haiti, Guatemala, Jamaica and others were poorer than Peru, but data is not available.

σ-convergence

Period 2 Across all countries, the GDP per capita dispersion along the second period increased. (Figure 5·5). It seems that the growing dispersion is due to the non industrialized countries dispersion. The second period does not exhibit σ-convergence.

Industrializers Clearly the GDP per capita dispersion has diminished for this group. The industrilizers group experienced at the beginning of the period, high levels of dispersion among its countries but later the dispersion diminished. They exhibit σ-convergence. The reason is that all countries in this group experienced high growth rates which allow them to converge.

Non-Industrializers The non-industrializers were less diverse at the beginning but they ended up diverging. Looking to the data of the non-industrializers group in a five-year period (Table B.7), shows that the poor countries (except Peru) worsened their situation. A lot of them experienced continuos negative growth rates, the worst cases being Honduras (from 1930-1944 in average -3%), Haiti (from 1955-1969, -2%) and Paraguay (from 1940-1954, -2%). So the reason of divergence in this group is because some poor countries did very poorly and that widened the gap between rich and poor countries.

Beta Absolute and Conditional β-convergence

The NLS estimations of table 5.3 show absolute β-convergence only for the industrializers at a rate of 2%. The speeds of absolute and conditional β-convergence with panel data are calculated in table 5.4[11]. Absolute and conditional β-convergence is found for the industrializers at rates of 1.4% and 0.6% respectively. The result of absolute β-convergence for the industrializers is robust since it is found by NLS and Panel data estimations and the rates are not too different. The whole period and the non-industrializers diverged in an absolute way but converged in a conditional way at rates of 4% and 7% respectively.

[11] κ is 10 for the industrializers and 6.3 for the non-industrializers.

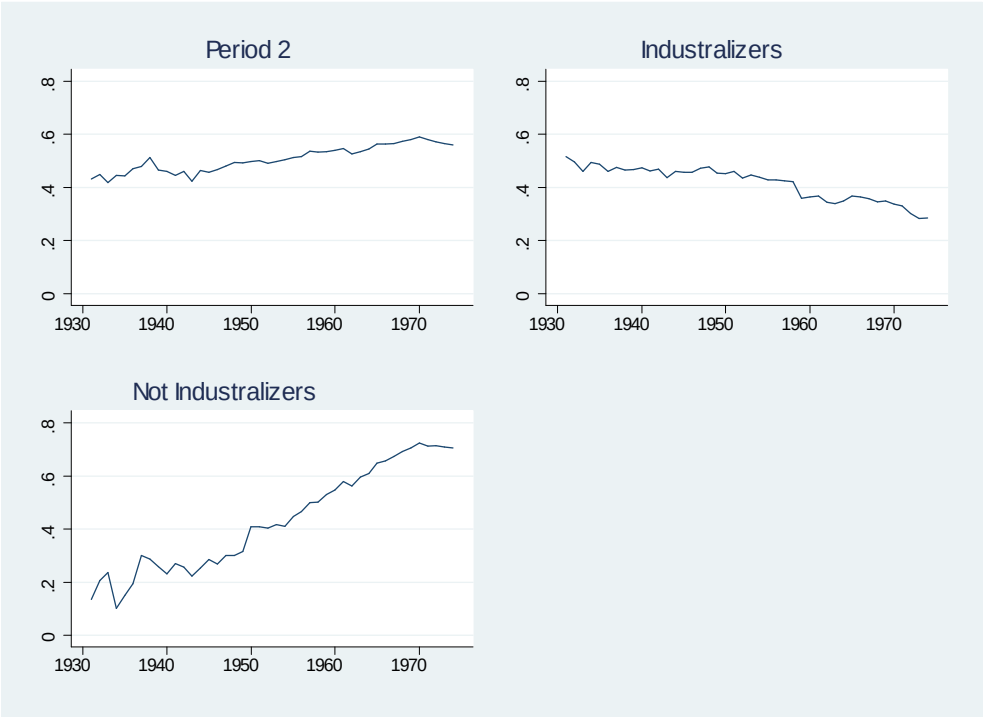

Figure 5·5: Sigma convergence in period 2, industrilizers and non-industrializers groups. Standard deviation of the logarithm of GDP per capita among countries in each group.

Period 2 and the non-industrializers group do not share a steady-state, since absolute and σ-convergence were not found simultaneously, so country controls need to be added to measure convergence.

On the contrary, the industrializers had the same steady-state. With or without controlling for each country specific unobserved characteristics, the industrializers converged. The reason of their convergence is due to the industrialization process. They were able to succeed, despite all the distortions that the ISI brought, in innovating some industries making the technology transmission to be more fluent.

Therefore, the conjecture of section 5.2.2 about the second period can be accepted. The conjecture was that during the second period countries went on their own way of development by industrializing or not, such that each country's own experience was more important in determining convergence than the external common factors as it was for the first period. Moreover, thanks to the grouping, it was detected that the industrilizers converged among them but the non-industrializers diverged.

5.5 Third Period (1975-2005): Debt led growth, Structural Reforms and the Paradigm Shift

This period starts after the great increase in oil prices in 1974 and ends in 2005, where availability of data ends. This is the hardest period to evaluate because LA countries have experienced several changes, each one different from the other, making it difficult to divide the groups. However, the characteristics chosen to guide the division of groups are those that occurred at the end of the period, because in some way they are a result of what happen along the period.

At the end of the period countries tried to link growth with welfare in a globalization context. So countries are divided into three groups: those that were able to provide the link, the good institutions group, the ones that suffered serious consequences of the debt crises; the painful group and the Caribbean countries which are different from the other groups and are quite vulnerable to external factors, the vulnerable group.

Regarding convergence, σ-convergence was found until 1990 for the whole period and for the good institutions group. After 1990 and for the other groups the GDP per capita dispersion was constant in general. Absolute and conditional β-convergence was found for all groups, which shows that all groups shared a steady-state.

5.5.1 Description of the period

The oil shock of 1974 allowed LA to depend more heavily on lending from abroad. The mechanism is described by Cardoso & Helwege (1992) as follows: *"..Oil exporters deposited their earnings in the commercial banks of developed countries, but higher oil prices caused a recession in OECD countries and reduced the demand for credit. Left with excessive liquidity bankers eagerly lent to the Third World at very low interest rates.."* . Therefore LA countries found it reasonable to accumulate debt and did not prevent the coming debt crises.

The debt crises started in 1979 and 1981 when Unites States and other OECD countries kept their money supply tight and increased the interest rates radically. Since countries acquired loans at floating interest rates, their debt obligations increased a lot[12]. The adjustment and consequences of the crises differed from country to country. Some applied orthodox and other heterodox policies. The orthodox policies are characterized by being very radical. They follow the Neoliberal Package (explained below). The heterodox policies are more flexible, based usually on trying not to harm the workers but maybe not efficient when solving problems as the imbalance of payments or inflation. However, in general the adjustment left common problems that reinforced each other such as capital outflows, fiscal deficits, inflation, overvaluation and balance of payment crises.

Adjustment and Consequences of the Debt Crises

The adjustment of the debt crises was very painful for LA countries. Overvaluation of the LA currencies from the previous period led to a current account deterioration (exports

[12] The average real interest rate on LDC debt rose from -6% in 1981 to 14.6% in 1982 (Thorp, 1998)

were lower than imports). The overvaluation was possible to maintain by the capital inflows coming from borrowing (during the 70s). Once the debt crises started, the LA risk increased, since they were not able to pay their debt, and a massive capital outflow occurred. Governments were not able to continue their policies and had to make drastic changes. Some countries, such as Brazil and Mexico, responded to the balance of payment crises by restrictive fiscal policies to reduce the demand for tradables, which deepened their recessions. In fact, after the adjustment almost all countries experienced negative growth rates. The average growth rate for the five-year- period from 1980 to1985 was nearly -1%.

In general, governments printed more money to cover or keep their fiscal deficits constant. With all the borrowed money, governments were used to spending more than their incomes[13]. Since printing money can cause inflation pressures and damage real wages, some governments indexed the nominal wages to prices to keep real wages constant. Speculators, trying to earn from the indexation, raised prices at higher rates than salaries. Sooner or later inflation exploded into hyperinflations and governments were no longer able to manage it.

Hyperinflations have devastating consequences; they damage the lower classes, reinforce overvaluations, increase country risk and the currency credibility. In fact, a lot of the LA countries became extremely dollarized. (i.e. Peru, Bolivia, Ecuador)

Countries were desperate to stabilize and gain access to foreign credit again and the "neoliberal policy package" was an option (or an obligation imposed by the creditors) to reach stabilization. Some countries took the package as such, and others took some elements of it.

[13]During the 70s there was a strong presence of militar regimes and a lot of expenses was directed to militar equipment (i.e. Chile, Bolivia and Paraguay). Others like Mexico, Argentina and Venezuela redirected resourse to intensive hydroelectric projects. Colmbia, Mexico and Venezuela financed a lot of investments with the loans (Thorp, 1998)

The Neoliberal Policy Package

The Neoliberal policy package, also known as the "Washington Consensus" was focused on fiscal orthodoxy, liberalization, and reducing the role of the State. The main institution prescribing these policies was the IMF, which suggested to cut budget deficits by reducing expenses and increasing taxes), privatize, liberalize imports and exchange controls (devaluate), eliminate price controls (to reflect the real costs), and increase interest rates (Cardoso and Helwege, 1992). These reforms are summarized for each country and year in the Table (C.1) in the appendix.

Consequences of the Package

Although countries sooner or later followed the structural reforms, the results were not as good as expected. The suggested devaluation can solve, in theory, the current account imbalance by shifting import costs and promoting exports, but in practice, the export sector of several countries failed to react postitively to the exchange rate depreciation. Moreover, higher prices of imported goods reinforced inflation and consequently overvaluation.

As predicted by the IMF the state had no role anymore. With higher interest rates it was hard to promote Investments, and due to the tendency of overvaluation and weak export sector neither was it possible to promote exports. Furthermore, governments had to close factories resulting in high rates of unemployment and a larger informal sector.

However, during the 90s some countries experienced a modest improvement in their growth rates (like Argentina, Chile, Uruguay, Peru, Bolivia, etc.) as a result of exports of natural resources but still their terms of trade deteriorated. Remittances increased, specially in Mexico, Colombia, El Salvador and Jamaica. Investments and savings increased but according to Thorp not enough to sustain a serious development effort. The informal sector was concentrated in the microenterprises.

Regarding welfare results, income distribution worsened in all countries outside of the Caribbean except in Uruguay and Costa Rica (in Colombia it was constant). Poverty, which worsened during the 80s, hardly improved during the 90s (Thorp, 1998).

Clearly the policy package was lacking of sectorial policies and programs to diminish social problems and inequalities. This situation pressured a rethink about the link between growth and equality.

The New Paradigm Shift

Some trends of thought support the idea that good institutions create complementaries between productivity growth and equality (Neo-structuralists from ECLAC). Others maintain that policies that are linked to the political constituency will create a combination of economic and social development. When the population participates in the process of making decisions, the feeling of ownership helps to monitor and accomplish their obligations better. Thorp calls these new currents the New Paradigm Shift, which started at mid 80s, as a response to the poor welfare results.

Thorp points out that the rise of the paradigm shift is a result of the increasing capital flows, the debt crises and the costly adjustment process. However, it is hard to attribute the results to either globalization or policy shifts. Instead, Thorp proposes to look at the institutional context and each country's experience to derive some conclusions about the significance of globalization and the shift in paradigm in terms of growth and social welfare.

For this purpose, Thorp analyzes the factors that have conditioned the industrialization process, rural development and deepened unequal distribution of wealth. These conditioning factors are the economic, political and social structures that tend to reinforce each other but are not deterministic, for example the types of institutions, the interaction between the public and private sector, and the threats and opportunities that rise. Thorp analyzes each country's set of conditions and finds common behaviors.

5.5.2 Description of Groups

Good Institutions

The group of good institution is composed of seven countries: Chile, Argentina, Uruguay, Mexico, Colombia, Costa Rica and Brazil. Although some of the countries in this group

have had weakened institutions, such as Argentina, they have managed to reach either acceptable growth rates, good welfare standards or both. Therefore Argentina is included in this group, because even after their crisis in 2001, they still have the highest HDI level of South America[14].

On the one had, Chile, Argentina, Uruguay and Mexico were able to use the paradigm shift in a creative and effective way thanks to the prior conditions they met. Chile is the best example. Although their degree of inequalities and poverty is still high, they have managed to build strong institutions, and good relations among the public and private sector. The State promoted exports and investments. Even though they have applied radical orthodox policies and hosted radical violent military regimes, they have built a political consensus. They truly committed to the rules of the free market game, gaining investors confidence. Moreover Chile has developed a process of consultation to identify poorly designed policies. In general Chile had historically stronger institutions than elsewhere in LA.

Argentina and Uruguay had a similar experience to Chile. Both went under military regimes but Argentina did not learn from this experience as Chile did while Uruguay built its political consensus from it. Argentina had a lot of political problems and adopted both orthodox and heterodox policies (as Mexico). In the 90s it implemented the "convertibility plan"[15], whose purpose was to establish strict discipline on the monetary and fiscal policy and was the keystone for entry into the international system. This attracted investments and together with the privatizations carried on, the quality of public services improved. Between 1990-1994 Argentina grew at 5% (see table B.5). Nevertheless, in 2001 Argentina went into a crisis. The weak fiscal policy, big fiscal deficits from the provincial governments were reflected in an increasing public debt burden, and the growing overvaluation led to a debt crisis on adjustment of exchange rate, behaving as a delayed version of the debt crisis explained in section 5.5.1. Moreover, both Uruguay and Argentina were part of MERCOSUR, which helped them to promote dynamic firms. Uruguay was the only

[14] IDH, PNUD 2006

[15] the "convertibility plan" established, in 1991, a currency board with a fixed exchage rate (to the US dollar) dictated by law.This brought confidence on the national currency and reduced uncertainty

country to have improved their welfare indicators during this period and was known by the democratic process of using popular consultation to approve policies.

Mexico, according to Thorp, used the paradigm shift as well, particularly because of their strong international orientation (the NAFTA-North American Free Trade Agreement[16])

On the other hand, Brazil, Colombia and Costa Rica, progressed not because of the paradigm shift, but because they had been coherent with their policies earlier. Colombia, for example, managed to build very strong and qualified institutions that managed the economic issues very well, they did not borrow too much nor had hyperinflations. In fact, Thorp points out that Colombia is the only country where liberalization coincide with a growing state, reflected in the rapid growth of social spending. Nevertheless, corruption and drugs were serious social problems. Costa Rica is characterized by their democratic values, good relations with the private sector and high standard of education. The adoption of the "Package" was costly as Thorp mentions, because they were already stable but after the debts crises their social indicators even diminished slightly. Finally Brazil, due to its size was allowed to integrate to the global market in its own way and speed as everybody wanted to have access to Brazils huge market.

Painful

The Painful group, is composed of nine countries: Peru, Bolivia, Ecuador, Paraguay, Venezuela, Nicaragua, El Salvador, Guatemala and Honduras. This groups is characterized by having weak institutions that lead to bad results either in terms of growth, welfare or both.

Bolivia and Peru did not meet the prior conditions that link growth with welfare. Their structural problems exposed them dramatically to the perils of globalization and they applied orthodox policies. Peru had institutional weakness, lack of experience and lack of democracy to sustain the reforms. Bolivia, took a lot of time to recover from the

[16]Is a trade bloc between USA, Canada and Mexico

battle with hyperinflation, which was impossible without severe repression. Moreover their levels of poverty are among the highest in the region.

Ecuador, Paraguay, Venezuela, Nicaragua, El Salvador, Guatemala, Honduras, are characterized by having had bad experiences with the "paradigm shift". They lacked institutions that could pursue opportunities or neutralize threats, didn't take into account the huge social costs of the paradigm shift, had social conflicts with guerrilla forces (Guatemala and El Salvador), and problems of contraband (Paraguay). As an oil country, Venezuela mismanaged several oil booms, provoking a banking crisis in 1991. Although they liberalized there was a lack of political support and proper communication of the reforms, resulting in resistance. Venezuela, Ecuador and Paraguay faced strong opposition in abolishing all protection. And after 34 years of a military regime[17], Paraguay could not build an efficient system of Government.

The central American economies were severely affected by the crises, (except Costa Rica) because they had a lot of oppression and corrupt military and civilian regimes. They tried to undertake market reforms but due to its political fragility they couldn't succeed. Moreover, poverty and exclusion are a common denominator for these countries.

Vulnerable

Finally, the vulnerable group include sixteen Caribbean countries: Bahamas The, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Panama, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago.

The Caribbean countries were more severely affected by the adverse trends of the 1970s and 1980s than the rest of LA. While one or two countries could benefit by developing financial services (the Bahamas, for example), most acquired debt and vulnerability to capital flight and international interest rate changes. These economies are characterized

[17] Stroessner was president of Paraguay from 1954-1989

by being too vulnerable to external shocks. They are quite open[18] and primary products producers. Their agricultural sector performed so poorly that they are net food importers. Although Cuba is different from the other countries, it is still extremely vulnerable to external factors. When the Soviet Union collapsed, their exports were reduced dramatically. Additionally Caribbean countries are exposed to natural disasters. Equality and human development in the Caribbean countries is characterized by the case of Haiti. Between 1991 and 1997 Haiti lost 31 places in the United Nation Human Development Index (HDI) ranking; Cuba and Jamaica lost 24.

5.5.3 Convergence Results

Catching-up Countries

Period 3 The fast growing countries were Chile, (2.8%), Trinidad and Tobago (2.2%) and Dominican Republic (2%) and the poorest countries at the beginning of the period, in 1975 were St.Vincent and the Grenadines (945$), Haiti (1,032 $) and Honduras (1,570 $). Therefore none of the poorest countries catched up.

Good Institutions From the good institutions group, the poorest countries were Colombia (3,622 $) and Brazil (4,190 $) and fastest growing countries besides Chile were Colombia and Uruguay (1.5%). Therefore, the country catching up was Colombia.

Painful From the Painful, the poorest country besides Honduras was Paraguay (2,220 $) and the fastest growing countries were Ecuador and Paraguay (1.1%). Therefore Paraguay was catching up among the countries in the tail.

Vulnerable From this group, the country at the tail in 1975, besides St.Vincent and the Grenadines and Haiti was Dominican Republic (2,111$) and the fastest growing was

[18] In the 1990s 19 of the 26 Caribbean states had a ratio of Exports and Imports to the GDP over 100 percent (Thorp, 1998)

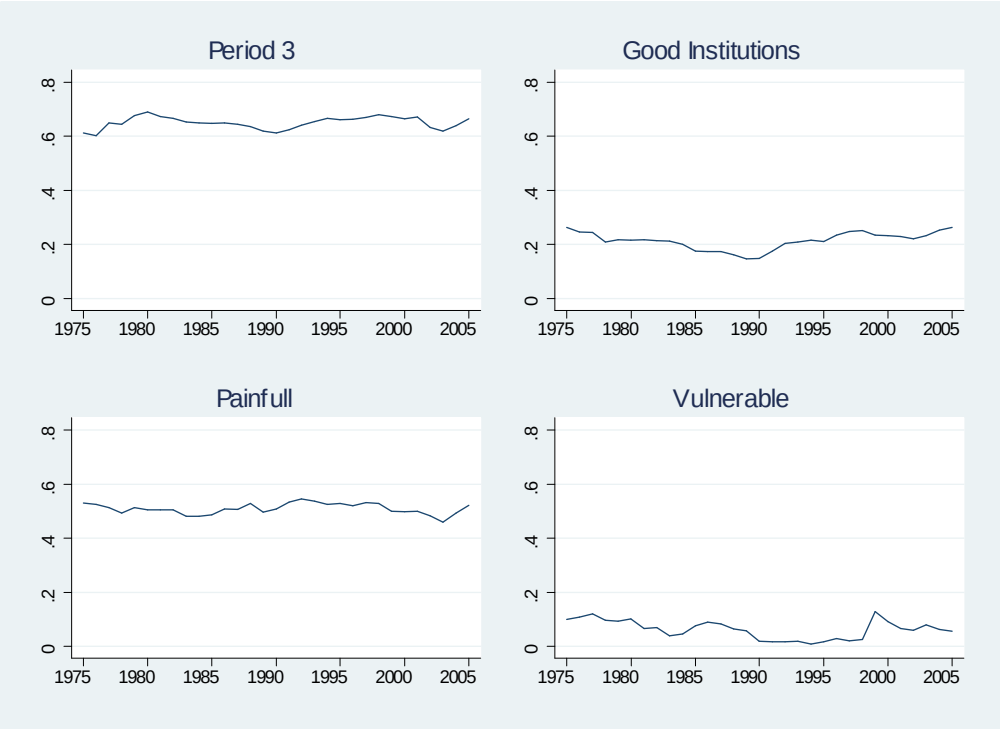

Figure 5·6: Sigma convergence in period 3, good institutions, painful and vulnerable groups. Standard deviation of the logarithm of GDP per capita among countries in each group.

besides Trinidad and Tobago and Dominican Republic Panama (1.6%). Therefore the country catching up is Dominican Republic

σ-convergence

Period 3 Across all countries, the GDP per capita dispersion along the third period seems to be overall constant (Figure 5·6). It is hard to determine whether there was σ-convergence or not. It seems that countries σ-converged until 1990 and σ-diverged afterwards until 2003 where they again showed a decrease in their dispersion. The reason of convergence until 1990 is due the adjustment of the debt crises.

Good Institutions The good institutions group experienced slight σ-convergence until 1990 and then σ divergence. The reason is that almost all countries experienced negative

growth rates after the debt crises, except Colombia. On average growth rates for the period 1980-1984 were -2%. For the next five year period, 1985-1989, almost all countries recovered with positive growth rates, except Argentina (-3%). After 1990 the richest countries recovered such that the dispersion levels increased again.

Painful The Painful group have the highest dispersion levels and during the whole period it is fairly constant. After the debt crises all countries, except Paraguay went into recession (negative growth rates). But some countries did worse than the others and took a lot more time to recover. For instance Nicaragua experienced from 1975 to 1994, in average, a negative growth rate of -12%. Almost all countries experienced negative growth rates from 1980-1989, except Ecuador and Paraguay (see Table B.14 in appendix).

Vulnerable The Vulnerable countries, the Caribbean, are characterized by being quite homogenous, their GDP dispersion is very low. However it seems that there was σ-convergence until 1995, and from there the dispersion rate increased reaching the highest dispersion in 1999 and then lowered again.

The lowest dispersion was of 1994 and was due to the fact that the richest countries experienced negative growths. The Bahamas and Barbados had negative growth rates, of around -3% during 1990-1994. Around 1999 their GDP dispersion was the highest, because some countries did very well but others poorly, like Haiti, which around 2000 had the periods lowest GDP per capita

Absolute and conditional β-convergence

From table 5.3, the first column shows the results of the absolute β-convergence estimated by the NLS method. The good institution group converged at a speed of 3%, the painful at nearly 1% and the Vulnerable diverged. The speeds of convergence estimated by panel data are in Table 5.4. All groups together converged in an absolute and conditional way[19].

[19] κ is 14.5 for the Good Institutions group, 9.3 for the Painfull group, and 6.8 for the Vulnerable.

The results of absolute β-convergence differed with the method for the case of the third period and the vulnerable group. Since a lot of changes happened during the third period, it is better to rely on the panel data estimations because they take into account time-varying information. Therefore, the third period and the vulnerable group converged in an absolute way at 0.7% and 0.05% respectively. The good institutions speed of absolute β-convergence was close to 2% and of conditional β-convergence was 3.6%. The Painful speed for absolute β-convergence was 0.7% and for conditional 5.7%. The vulnerable speed of conditional β-convergence was around 6%.

All groups in the third period and the third period itself have the same steady-state, since absolute and σ-convergence were found simultaneously. Therefore, the conjecture made in the previous section 5.2.2 about the third period can be accepted and applied for each of the groups. The conjecture was that common external factors were determinant of the path of convergence, as is the debt crises, but also each country's own experience in reference to their behavior with respect to the usage of the paradigm shift.

5.6 Integration Processes

The integration processes that are more advanced in LA are four custom unions: the MCCA (*Mercado Común Centroamericano*-Central American Common Market), CAN (*Comunidad Andina*-Andean Community), CARICOM (Caribbean Community) and MERCOSUR. (*Mercado Común del Sur* - Southern Common Market).

Regarding convergence, σ-convergence was found only for Caribbean union-CARICOM. Absolute and conditional β-convergence was found for the Andean union-CAN and Caribbean union -CARICOM. The southern cone union-MERCOSUR only presented conditional β-convergence. These results suggest that neither the MERCOSUR nor CACM members have the same steady-state while CARICOM and CAN are more homogenous and have similar steady-states.

5.6.1 Description of Groups

A custom union is a free trade area with a common external tariff. Members set up common external trade policy, but in some cases they use different import quotas. In LA there are four custom unions

MCCA

The Central American countries union was created during the ISI, in 1960, and is composed by five countries: Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica.

CAN

The Andean countries union was also created during the ISI, in1969, and nowadays has four members: Bolivia, Ecuador, Colombia and Peru. Chile and Venezuela were members as well, but Chile withdrew in 1976 and Venezuela in 2006.

CARICOM

The Caribbean countries union was created in 1975, and groups a lot of islands and english speakers members: Antigua and Barbuda*, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat*, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname*, and Trinidad and Tobago.(the * countries are excluded from the analysis due to lack of data).

MERCOSUR

Finally, the southern cone countries union was founded in 1986 and currently has five members: Argentina, Brazil, Paraguay, Venezuela and Uruguay. Venezuela entered in 2007.

5.6.2 Convergence Results

σ-convergence

Figure 5·7 shows the σ-convergence pattern for all custom unions for which data was available. The line shows the year of creation. It seems that the Caribbean countries have σ-converged drastically after the CARICOM creation. Before the union's creation the Caribbean countries seemed to diverge a lot. Therefore, it may be concluded that the creation of the union helped to diminish the dispersion among its members.

On the other hand, the Central American countries had constant levels of dispersions but after the MCCA the dispersion shot upwards. Similarly, the Andean countries, after their union CAN creation, seemed to have continued with their increasing dispersion.

The southern cone countries kept a constant level of dispersion after the MERCOSUR creation. It looks as if the pattern of divergence was diminishing but after the union's creation, the pattern stopped and was kept constant.

Absolute and conditional β-convergence

The results of absolute and conditional β-convergence, during the year of each union's creation until 2005, are in tables 5.4 and 5.3. It can be seen that the Central American countries members of the union MCCA have diverged under both absolute and conditional concepts. So they do not share a steady-state.

The Andean countries union, CAN, show robust absolute β-convergence and conditional β-convergence. With NLS the absolute β-convergence was at a speed of 0.4% and with panel data 0.1%. The conditional β-convergence was around 4%.

The Caribbean countries union, CARICOM, do not show robust results of absolute β-convergence because single cross section estimations show that the union members have diverged and with panel data that they have converged. However, the panel data estimations are preferred, which exhibit a low absolute β-convergence of 0.2% and a conditional β-convergence of 6%.

The southern-cone countries union, MERCOSUR, exhibit robust results of absolute

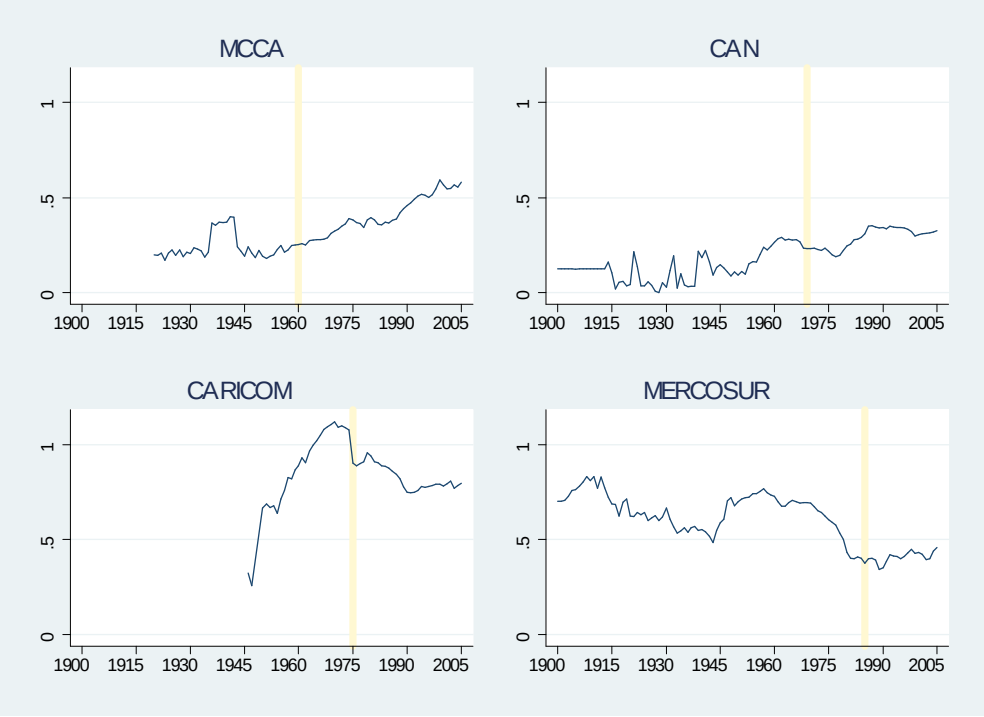

Figure 5·7: Sigma convergence in the Custom Unions of Central American (MCCA), Andean (CAN), Caribbean (CARICOM) and Southern Cone (MERCOSUR) countries. Standard deviation of the logarithm of GDP per capita among countries in each group.

divergence and conditional β-convergence. The conditional β-convergence was estimated to be around 6%, suggesting that the union's members are heterogenous and do not share a common steady-state.

Linking the convergence findings to the theory presented in section 2.3, in order to reach economic convergence the four LA custom unions need to be further deepened. Economic convergence will be expected in the last stage of economic integration and the LA processes of integration are just in the third stage.

Another implication of the results is that the custom unions are also showing grouping by geography, and it seems that geography is not a determinant of groups where convergence should be expected. Only the Andean and Caribbean seem to have a common steady-state. The southern cone countries do not share a common steady-state and, surprisingly, the Central American countries, which are closer to each other exhibit different steady-states.

5.7 Summary

This chapter has analyzed the history and evidence of convergence in LA. Before presenting the results the chapter did a brief analysis of LA development and its convergence with the world, particularly the US. It was found that LA growth has been volatile and discrete and its development has worsened with time. Growth rates were higher at the beginning of the 20th century than in recent years. Relative to the US and other countries, LA was in a better position during the first 30 years. The few LA countries that were doing well compared to the US at the beginning have lost ground during the last decades.

A great part of the chapter was devoted to understanding the different historical economic facts of each of the three periods and each of the groups of countries. In total 18 groups were analyzed statistically: a group of the 8LA across 106 years, a group of 8LA in each of the three periods, a group for all LA countries, one for each of the three periods; two groups in period 1, the agricultural and mineral; two groups in period 2, the industrializers and non-industrializers; three in period 3, good institutions, painful and vul-

nerable; and four groups from the integration processes in LA, MCCA, CAN, CARICOM and MERCOSUR. Convergence was expected to occur inside each group, since they had similar processes of development (with or without intention).

The results of the convergence analysis are summarized in Table 5.5 where the first column is for σ-convergence, the second for absolute β-convergence and the third column is for conditional β-convergence. 1 stands for convergence, - for divergence

σ-convergence among countries was found during the first period group, the 8LA (in all periods and in each period), agricultural, mineral, industrializers, period 3 (until 1990), good institutions (until 1990) and the CARICOM groups. Constant GDP per capita dispersion was found inside the Painful, at high levels of dispersion, and inside vulnerable and MERCOSUR group, both at low levels of dispersion.

absolute β-convergence estimated by single cross section regression and panel data showed similar results, demonstrating the robustness of the finding, except for three cases (in bold 1 in table 5.5). In those cases panel data estimations are preferred because of the time varying information consideration.

The countries that exhibited absolute β-convergence were in the following groups: 8LA, in 106 years and in each of the three periods, period 1, mineral, industrialized, period 3, good institutions, painful, vulnerable, the Andean countries union - CAN and the Caribbean countries union-CARICOM. The average absolute speed of convergence was around 2% with single cross section regression and 1% with panel data. The single cross section regression is higher because it takes into account less information.

With panel data results, the groups at the top of high speeds of absolute β-convergence were the minerals, with a speed of 3% and the 8LA-third period and Industrializers with a speed of nearly 2% each. The lowest absolute speed of convergence was for the period 1, CARICOM, CAN and vulnerable each with speeds of convergence below 0,5%.

conditional β-convergence was found in all groups except for the first period, the mineral and the Central American countries union MCCA groups. The speed of convergence was in average 5%. The highest speed of conditional β-convergence was for the non industrializers

Groups of countries		Convergence		
		Sigma	Absolute	Conditional
All periods	8 LA	1	1	1
Period 1 1900-1930		1	1	-
	8 LA	1	1	1
	Agricultural (9)	1	-	1
	Mineral (4)	1	1	-
Period 2 1931-1974		-	-	1
	8 LA	1	1	1
	Industrialized (6)	1	1	1
	Non-Industriliz (17)	-	-	1
Period 3 1975-2005		1[a]	1[a]	1
	8 LA	1	1	1
	Good Institutions (7)	1[a]	1	1
	Painful (9)		1	1
	Vulnerable (16)		1[a]	1
Regional Blocs				
1960-2005	MCCA (5)	-	-	-
1969-2005	CAN (4)	-	1	1
1975-2005	CARICOM (12)	1	1[a]	1
1986-2005	MERCOSUR (5)		-	1

Table 5.5: Summary of convergence results. Where 1 stands for convergence, - stands for divergence and blank stands for constant convergence. Substrict a means that convergence is less robust. When a is in sigma means that convergence was found only until 1990. When a is in absolute, means that convergence was found only with panel data.

group, 7%. The lowest speed of convergence was for the Industrializers, 1%.

For those groups of countries were absolute and σ-convergence were found simultaneously, it can be said that their countries shared a common steady-state. The ones that had the same steady-state, besides the 8LA, were the industrilizers in the second period and all groups from the third period including the third period itself. From the integration processes the Andean countries union, CAN, and the Caribbean countries union, CARICOM seem to have a similar steady-states as well.

These results are supported by facts along the LA history. During the second period the industrializers converged because they were able to succeed, despite all the distortions that the ISI brought, in innovating some industries making the technology transmission to be more fluent. All groups in the third period and the third period itself shared common external factors that was determinant for the path of convergence, as the debt crises, and also each country's own experience in reference to their behavior with respect to the usage of the paradigm shift.

On the other hand, in period 1 and in the mineral group absolute but not conditional β-convergence was found. The reasons were that they converged due to common external factors as the WWI and due to the fact that Venezuela, a mineral country, discovered great quantities of oil and was able to catch-up.

Chapter 6

Conclusions

The *economic convergence* term is used when two or more economies tend to reach a similar level of development and wealth. The study of economic convergence is an important topic for economists; besides being useful for the debate between different economic theories, it has practical applications. It addresses inquiries as if the distribution of income between economies has become more equal over the time, if poverty persists, if poor economies are in their way of catching up the rich economies and at what speed, and if rich economies tend to be always rich or the pattern of income-ranking can change.

After a revision of different theories, several concepts of convergence were identified such as σ, β absolute, β conditional , club, and catching up convergence. The theoretical framework chosen in the thesis is the neoclassical, from which a model is selected based on the growth model of Solow (1956) and on the optimal growth model of Ramsey (1928). The choice of the model is based on different reasons; it has a solid theoretical base, it is the most used in the literature, it is simple to test and it reaches concrete results about convergence. The model is able to test whether income distribution among different economies has become more equal, *σ-convergence*, and if there has been an upward mobility in the same distribution and how fast this has been, β-convergence.

β-convergence can be conditioned on specific characteristics of the economies that do not vary over time such as geography, weather, culture, etc. In that case, if β-convergence is found, it is called *conditional β-convergence*. When these characteristic are excluded and β-convergence is found it is called *absolute β-convergence*. When both absolute and conditional β-convergence are found, economies tend to have similar steady-states.

β-convergence and catching up convergence are measured in the same way but differ in

their arguments. The former is based on the argument of diminishing returns to capital and the latter on the argument of technology transmission. A problem with the diminishing returns to capital argument is that it predicts unrealistic high shares of capital. The interpretation of the thesis results are based on the second argument, because it is a more realistic case for LA.

Regarding club-convergence, although the usual procedures to study it, as Monte Carlo simulations or Sthochastic Kernel distributions, were not done in the thesis, the results can suggest resemblance with this concept because different convergence groups, as clubs, were identified.

This thesis has analyzed the case of convergence in LA. LA countries are characterized by having few language barriers, similar culture, religion and common history. So convergence could be expected. However, the literature for the LA case is scarce compared to other countries especially the most developed and preliminary analysis showed that divergence was present among all countries. The few studies about convergence in LA, do not disentangle the different periods in the economic history and its association with convergence. Their results are quite diverse and not robust. The thesis has filled the gap by covering the theoretical, historical and statistical evidence of convergence in LA during 106 years, from 1900 to 2005.

The study has endeavored to analyze the most important historical facts of 32 LA countries in more than a century. From this complicated task several groups were identified in which convergence was expected to occur and later tested. In spite of the difficulties with the data, absolute β-convergence was tested through single cross section regression and panel data estimations controlling by time effects, conditional β-convergence was tested through panel data estimations controlling by time effects and country specific unobserved characteristics, and σ-convergence was analyzed by graphs of income dispersion. The results in general show a success with the groupings. Below the results are presented in the same order as the questions were stated in the introduction.

Has the convergence pattern changed in 106 years? Have economic shocks in

LA influenced on the path of convergence? Is it possible to determine different periods of convergence? Under which periods have convergence accelerated? What are the empirical and theoretical reasons?

The results showed that the general convergence pattern has changed in 106 years. The changes were determined by several external shocks that whipped the LA region, especially the Great Depression, the Oil crises of the 70s and Debt Crises of the 80s. These shocks together with each countries responses determined three different periods of convergence.

The *first period* ranges from 1900 until 1930 - year when the Great Depression whipped LA economies- and it is characterized by LA intensively exporting primary products. Therefore it is called *Export-led as Development Tool.* An inward-looking model was the response to the Great Depression, so the *second period* is called *Import Substitution Industrialization* which goes from 1931 to 1974 - when the oil crises occurred. Finally the *third period*, *Debt led growth, Structural Reforms and the Paradigm Shift* ranges from 1975 to 2005, when LA experienced the debt crises of 1979 to 1980, responding with several "structural reforms". From these reforms and from an accumulation of several factors during history, the need for a change in development to one with a more social outlook in a globalization context arose. This is called *The Paradigm Shift.*

Regarding convergence in each period, income distribution among LA countries changed to be less disperse (σ-convergence) and an upward mobility in the income distribution without conditionals (absolute β-convergence) was observed during the first and the third periods. The speeds of absolute β-convergence in both cases were below 1%. Conditional β-convergence was found during the second and the third periods, at speeds of 6%. The reason of higher speeds of convergence when conditioning by unobserved country-specific effects, is that conditional β measures convergence under the hypothetical case that all country differences are kept constant. Since absolute and conditional β-convergence were found simultaneously during the third period, it can be concluded that LA countries from 1975-2005, tended to have a common steady-state.

A review of LA's economic history suggests that the first period's absolute β-convergence

is due to common external factors that determined LAs development at that time such as the high world demand for primary products and the fluent capital inflows. The increasing trade of goods and capital allowed a more fluent technology transmission across LA countries.

The second period did not show absolute β-convergence among all countries, because some countries industrialized and others did not. This placed barriers to the technology transmission among all countries, but probably less barriers among those countries that could industrialize.

During the third period, LA countries opened their economies and were concerned about their institution building. These facts can explain the observed absolute β-convergence, which means that technology transmission was acceptable fluent.

Although absolute β-convergence was found for a great part of the sample, in total for 62 years, the speeds of convergence were very low compared to the usual 2%. A speed of convergence of 1% implies that every 69 years an economy will be half way closer to reach its steady-state.

Are there other groups besides the 8LA were convergence can be expected? Have these groups in fact converged? Which groups have converged the most? What are the empirical and theoretical reasons?

From the economic history revision it was found that some countries had similar characteristics among them but different characteristics with others. Therefore, in each period two to three groups were identified by having similar characteristics and it was expected that they would converge.

During the first period, since LA countries development was focused in primary product exports, two groups were identified: the *mineral* and *agricultural* products exporters. Throughout the second period, when countries followed a model of import substitution industrialization-ISI, two groups were identified: those that were able to *industrialize,* despite all the distortions that the model brought, and the *non-industrializers* which failed to industrialize for different reasons. During the third period, after the arise of a more social

concern of development and a willingness to participate in the globalization process, three groups were identified: *good institutions* countries, which developed institutions that could deal with growth and/or welfare, *painful* processes countries, which were traumatized by the debt crises adjustment, and *vulnerable* countries, which are the Caribbean countries and are characterized by being vulnerable to external factors.

σ-convergence was found in the two groups of the first period: the agricultural and mineral; in one group of the second period: the industrializers; and in one group of the third period: the good institutions. Absolute β-convergence was found in the mineral group at a speed of 3%, in the industrializers at 1%, in the good institutions group at 2%, and in the painful group at a speed 1%.

Historically, the mineral group presented the most rapid speeds of absolute β-convergence because the WWI favored them and Venezuela was able to catch up due to its oil. The industrializers exhibited absolute β-convergence because they were able to succeed in industrializing, despite the distortions that ISI brought. The good institutions, built strong institutions that could link growth with welfare and were able to insert themselves in the global markets. And the painful, were equally dramatically whipped by the debt crises. Theoretically, barriers to technology were less in these groups, but mostly in the mineral and good institution group, where the speed of absolute β-convergence was higher.

After conditioning by specific unobserved country characteristics, conditional β-convergence was found for all groups except the mineral. Therefore the groups of countries that tended to have similar steady-states were the industrializers, good institutions, painful and vulnerable groups.

What are the reasons behind the apparent convergence among the countries in the 8LA? Should more convergence among them be expected? Why does it seem that all the countries have diverged but not those from the 8LA? In the future which countries may converge to which?

From the four groups that tended to have similar steady-states, the industrializers and the good institutions groups presented stronger evidence that support that they have the

same steady-state. The evidence is that their speeds of conditional β-convergence do not vary greatly from their absolute β-convergence, as they do for the painful and vulnerable groups.

The industrializers and good institutions groups are composed by almost the same countries. The good institutions have one country that is not in the industrializers group: Costa Rica. In total the countries in both groups number six: Argentina, Brazil, Chile, Costa Rica, Colombia, Mexico and Uruguay. Lets call these countries the *new group*.

Six countries out of the 8LA are from the new group, the remainder two that are included in 8LA but not in the new group are Peru and Venezuela. Therefore, the observed convergence at first among the 8LA is due to the strong presence of the new group-countries, which showed convergence among each other. The average speed of convergence, absolute and conditional, of the new group during 75 years was around 2% per year, as it is found for the most developed countries. This implies that every 35 years a country from the new group will be half way closer to reach its steady-state.

The results also showed that other countries that are not in the new group may converge among them in the future. The painful and vulnerable groups have showed to have similar steady-states. Therefore the painful countries, Peru, Bolivia, Ecuador, Paraguay, Venezuela, Nicaragua, El Salvador, Guatemala and Honduras may converge in the future at a slow speed of 1% and the vulnerable countries, which are the Caribbean countries, may converge at a low rate of 0.05%.

Has economic integration processes in the region helped to accelerate the process of convergence?

σ-convergence was found only among the Caribbean countries union-CARICOM, after its creation. Absolute β-convergence was poorly present for the Andean countries after its union creation, CAN, at a speed of 0.1% and for the Caribbean union-CARICOM, at a speed of 0.2%. After controlling by country specific effects, conditional β-convergence was found for all unions except for the Central American countries union-MCCA. These results suggest that neither the southern cone countries union-MERCOSUR nor the Central Amer-

ican countries union-CACM members share the same steady-state while the Caribbean union-CARICOM and the Andean countries union-CAN are more homogenous and have similar steady-states.

Although, absolute β-convergence was found for two unions, their speed of convergence was close to 0%. Therefore, the integration processes have not really helped to accelerate the process of convergence among the union's members. The reason is that they are in an early stage of economic integration. Economic integration processes can bring economic convergence when they are developed like the case of the European Union, where convergence among European regions has accelerated especially after the creation of the monetary union. In Latin America the integration processes need to be deepened.

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Appendix A

Relation between β and σ- convergence

In order to see the relation between β and σ-convergence, it is necessary to refer to a similar process used to get Equation(2.7), but now for country i, for discrete periods going from $t-1$ to t and including a random disturbance u_{it}. So the conditional β-convergence is:

$$\log\left[y_{it}/y_{i,t-1}\right] = a_{it} - (1-e^{-\beta})\log\left[y_{i,t-1}\right] + u_{it} \tag{A.1}$$

where a_{it} is:

$$a_{it} = x_i - (1-e^{-\beta})\cdot\left[\log\left(\hat{y}_i^*\right) + x_i\cdot(t-1)\right]$$

By assumption u_{it} is a random variable with mean 0 and a constant variance across countries and time σ_u^2, independently distributed from $\hat{y}_{i,t-T}$, u_{jt} for $j \neq i$ and lagged disturbances (this assumption is discussed below) .

To simplify it is assumed that $a_{it} = a_t$, which is the absolute convergence concept. Arranging terms :

$$\log\left[y_{it}\right] - \log(y_{i,t-1}) = a_t - (1-e^{-\beta})\log\left[y_{i,t-1}\right] + u_{it}$$

$$\log\left[y_{it}\right] = a_t - (1-e^{-\beta})\log\left[y_{i,t-1}\right] + u_{it} + \log(y_{i,t-1})$$

$$\log\left[y_{it}\right] = a_t + e^{-\beta}\log\left[y_{i,t-1}\right] + u_{it}$$

and calculating the variance across countries and defining $\sigma_t^2 = Var\left[\log(y_{it})\right]$ and $\sigma_{t-1}^2 = Var\left[\log(y_{i,t-1})\right]$:

$$\sigma_t^2 = e^{-2\beta}\sigma_{t-1}^2 + \sigma_u^2 \tag{A.2}$$

Under the assumptions of $e^{-2\beta}$ and σ_u^2 being constant in time, it is possible to solve the first-order difference Equation(A.2) by successive calculation. The solution is:

$$\sigma_t^2 = \frac{\sigma_u^2}{1-e^{-2\beta}} + \left(\sigma_0^2 - \frac{\sigma_u^2}{1-e^{-2\beta}}\right)e^{-2\beta t} \tag{A.3}$$

where $\sigma_0^2 = Var\left[\log(y_{i0})\right]$ and the steady-state σ^2 is:

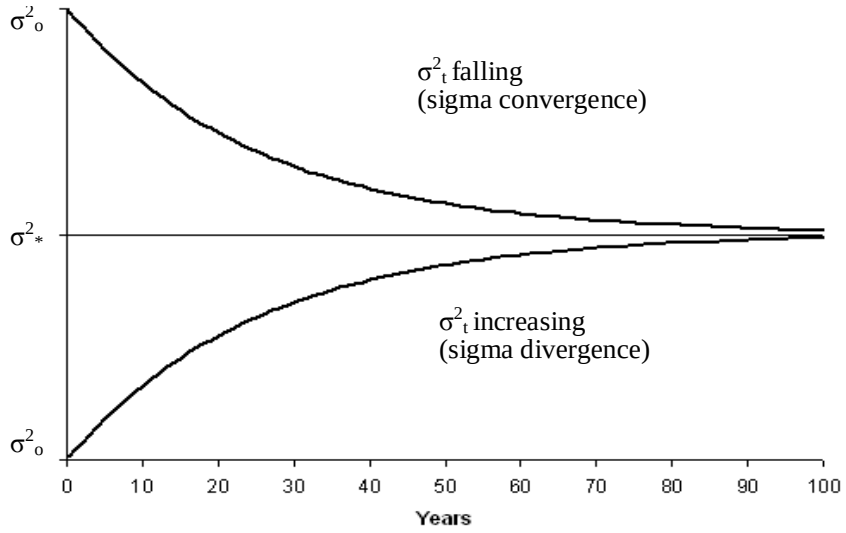

Figure A·1: Evolution of σ_t^2 when absolute β- convergence exists.

$$\sigma_*^2 = \frac{\sigma_u^2}{1 - e^{-2\beta}} \tag{A.4}$$

Thus A.3 can be written as::

$$\sigma_t^2 = \sigma_*^2 + \left(\sigma_0^2 - \sigma_*^2\right) e^{-2\beta t} \tag{A.5}$$

When $\beta < 0$ (β-divergence), in Equation(A.4), it can be seen that σ_*^2 will be negative and therefore by Equation(A.3) σ_t^2 will be increasing with time. So β-divergence cannot lead to σ-convergence. Therefore in order to have σ-convergence it is necessary to have β-convergence.

But when $\beta > 0$ (β -convergence) in Equation(A.3), σ_t^2 monotonically approaches σ_*^2 and whether σ_t^2 goes up or down together with time depends on the relation of σ_0^2, with respect to the steady-state value σ_*^2: when σ_0^2 is higher than σ_*^2 σ_t^2 will diminish and viceversa as it can be seen in the following figure:

So when there is β-convergence, is not for sure σ-convergence will exist (a falling σ_t^2). So β-convergence is a necessary but not sufficient condition for σ-convergence.

Appendix B

Description of Data

Country	Abbreviation	Country	Abbreviation
Argentina	arg	Honduras	hnd
The Bahamas	bhs	Haiti	hti
Belize	blz	Jamaica	jam
Bolivia	bol	St. Kitts and Nevis	kna
Brasil	bra	St. Lucia	lca
Barbados	brb	Mexico	mex
Chile	chl	Nicaragua	nic
Colombia	col	Panama	pan
Costa Rica	cri	Peru	per
Cuba	cub	Puerto Rico	pri
Dominica	dma	Paraguay	pry
Dominican Republic	dom	El Salvador	slv
Ecuador	ecu	Trinidad and Tobago	tto
Grenada	grd	Uruguay	ury
Guatemala	gtm	St. Vincent and the Grenadines	vct
Guyana	guy	Venezuela	ven

Table B.1: List of countries used in the thesis.

Country	Period 1 1900-1930		Period 2 1931-1974		Period 3 1975-2005		Total 1900-2005	
	g	y	g	y	g	y	g	y
arg	1.59	3,529	1.44	5,254	0.31	7,873	1.15	5,531
bhs					1.64	12,500	1.64	12,500
blz					2.84	3,264	2.84	3,264
bol			1.24	1,871	0.36	2,423	0.78	2,151
bra	1.78	861	2.84	1,949	1.22	5,108	2.07	2,565
brb					1.73	9,306	1.73	9,306
chl	1.91	2,455	0.88	3,980	2.84	7,288	1.74	4,516
col	1.50	1,200	1.95	2,283	1.54	4,768	1.71	2,703
cri	-0.29	1,647	2.29	2,423	1.24	5,121	1.63	3,305
cub		1,639	0.78	1,838	0.55	2,563	0.68	2,122
dma					2.76	1,932	2.76	1,932
dom			2.91	1,390	1.97	2,756	2.38	2,146
ecu			2.73	2,154	1.09	4,078	1.96	3,045
grd					2.11	3,542	2.11	3,542
gtm	3.35	1,459	1.45	2,269	0.20	3,301	1.20	2,547
guy					0.43	3,073	0.43	3,073
hnd	1.81	1,331	0.11	1,353	0.57	1,879	0.46	1,540
hti			0.07	1,006	-1.15	982	-0.56	994
jam		608	4.47	2,505	-0.04	3,479	2.02	2,961
kna					4.81	3,562	4.81	3,562
ica					2.83	2,074	2.83	2,074
mex	0.87	1,716	2.33	2,756	1.19	6,285	1.59	3,494
Nic	3.61	1,365	1.37	1,915	-2.58	1,829	0.17	1,820
pan			2.40	2,732	1.61	5,272	1.99	4,023
per	2.36	1,087	2.12	2,578	0.05	3,701	1.57	2,485
pri			5.07	4,270	2.85	10,243	3.90	7,371
pry			0.35	1,708	1.09	3,080	0.70	2,343
slv	1.22	981	1.89	1,563	0.45	2,424	1.29	1,806
tto			3.76	6,326	2.18	11,451	2.87	9,163
ury	1.90	2,942	0.64	4,422	1.49	6,758	1.24	4,686
vct					3.61	1,877	3.61	1,877
ven	4.93	1,292	2.49	7,150	-0.67	9,069	2.23	6,053

Table B.2: Growth rates and GDP per capita per period. Where g is the average growth rate of GDP per capita per period, measured in %, and y is the average GDP per capita per period, measured in International $.

Countries		1900-1904		1905-1909		1910-1914		1915-1919		1920-1924		1925-1929		1900-1929	
		g	y	g	y	g	y	g	y	g	y	g	y	g	y
Agricultural	mean	**2.72**	**1772**	**2.16**	**2030**	**-0.94**	**2207**	**1.90**	**1982**	**1.60**	**1,716**	**2.49**	**1,899**	**1.65**	**1,934**
	sd	0.05	112	0.05	109	0.08	157	0.07	145	0.06	103	0.07	141	0.06	128
	max	14.14	3191	8.63	3699	17.09	3904	15.19	3307	11.24	4,055	23.61	4,367	23.61	4,367
	min	-5.86	678	-12.29	718	-22.09	769	-10.25	798	-15.91	919	-15.53	925	-22.09	678
	obs	16	20	20	20	20	20	20	20	40	45	45	46	161	171
arg	mean	**3.67**	**2907**	**2.95**	**3562**	**-2.27**	**3714**	**0.03**	**3136**	**4.08**	**3,707**	**1.48**	**4,145**	**1.66**	**3,529**
	sd	0.07	192	0.04	109	0.07	237	0.10	209	0.03	261	0.03	190	0.06	200
	max	9.67	3191	8.63	3699	4.12	3904	15.19	3307	6.96	4,055	3.97	4,367	15.19	4,367
	min	-5.86	2717	-1.69	3459	-13.97	3302	-10.25	2790	-0.06	3,471	-3.41	3,919	-13.97	2,717
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
bra	mean	**1.23**	**710**	**1.71**	**751**	**0.10**	**801**	**2.76**	**829**	**2.69**	**1,001**	**2.10**	**1,074**	**1.76**	**861**
	sd	0.04	19	0.04	24	0.05	27	0.05	41	0.04	37	0.05	71	0.05	36
	max	7.32	730	7.01	776	8.35	836	10.30	895	7.31	1,046	8.88	1,158	10.30	1,158
	min	-2.10	678	-2.83	718	-3.90	769	-4.15	798	-2.09	963	-1.81	1,007	-4.15	678
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
col	mean	**1.64**	**1,017**	**1.70**	**1,097**	**0.56**	**1,200**	**1.49**	**1,230**	**0.03**	**1,255**	**3.63**	**1,403**	**1.51**	**1,200**
	sd	0.02	26	0.02	28	0.04	37	0.05	62	0.00	0	0.03	105	0.03	43
	max	4.90	1,039	4.65	1,131	3.30	1,236	7.92	1,292	0.16	1,255	6.59	1,505	7.92	1,505
	min	-0.21	973	-0.45	1,053	-6.07	1,162	-3.14	1,129	0.00	1,255	-0.02	1,255	-6.07	973
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
cri	mean									**1.28**	**1,621**	**-1.55**	**1,674**	**-0.14**	**1,647**
	sd									0.10	81	0.07	82	0.09	81
	max									11.24	1,709	7.90	1,802	11.24	1,802
	min									-10.17	1,527	-9.66	1,582	-10.17	1,527
	obs									4	5	5	5	9	10
cub	mean												**1,639**		**1,639**
	sd														
	max												1,639		1,639
	min												1,639		1,639
	obs												1		1
gtm	mean									**4.18**	**1,371**	**2.69**	**1,547**	**3.44**	**1,459**
	sd									0.07	94	0.05	107	0.06	100
	max									8.47	1,504	9.96	1,720	9.96	1,720
	min									-6.81	1,272	-2.95	1,460	-6.81	1,272
	obs									4	5	5	5	9	10
hnd	mean									**-2.74**	**1,246**	**5.45**	**1,416**	**1.36**	**1,331**
	sd									0.06	63	0.08	107	0.07	85
	max									4.40	1,309	15.24	1,547	15.24	1,547
	min									-9.28	1,141	-3.17	1,295	-9.28	1,141
	obs									4	5	5	5	9	10
nic	mean									**1.11**	**1,269**	**5.62**	**1,461**	**3.36**	**1,365**
	sd									0.08	55	0.14	216	0.11	136
	max									6.79	1,321	23.61	1,750	23.61	1,750
	min									-10.38	1,183	-15.53	1,249	-15.53	1,183
	obs									4	5	5	5	9	10
slv	mean									**2.18**	**959**	**0.46**	**1,003**	**1.32**	**981**
	sd									0.03	39	0.13	72	0.08	55
	max									4.33	1,017	14.44	1,069	14.44	1,069
	min									-1.42	919	-14.38	925	-14.38	919
	obs									4	5	5	5	9	10
ury	mean	**4.35**	**2,456**	**2.27**	**2,711**	**-2.16**	**3,113**	**3.33**	**2,732**	**1.61**	**3,014**	**2.49**	**3,627**	**1.98**	**2,942**
	sd	0.07	211	0.09	276	0.15	328	0.07	269	0.10	300	0.07	317	0.09	284
	max	14.14	2,640	8.48	2,973	17.09	3,508	10.32	3,135	11.23	3,397	11.11	3,906	17.09	3,906
	min	0.66	2,219	-12.29	2,334	-22.09	2,654	-7.18	2,470	-15.91	2,674	-6.36	3,188	-22.09	2,219
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30

Table B.3: Growth rates and GDP per capita for the agricultural group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Countries		1900-1904		1905-1909		1910-1914		1915-1919		1920-1924		1925-1929		1900-1930	
		g	y	g	y	g	y	g	y	g	y	g	y	g	y
Mineral	mean	**1.89**	**1293**	**1.39**	**1411**	**0.27**	**1553**	**1.46**	**1620**	**4.02**	**1,703**	**5.38**	**2,247**	**2.40**	**1,638**
	sd	0.04	51	0.03	39	0.06	66	0.09	128	0.11	186	0.08	273	0.07	124
	max	9.54	2120	8.80	2313	13.76	2656	25.37	2794	24.20	2,880	24.44	3,426	25.37	3,426
	min	-8.41	797	-7.43	793	-14.33	886	-24.82	921	-36.29	926	-12.99	1,157	-36.29	793
	obs	16	20	20	20	20	20	20	20	20	20	20	20	116	120
chl	mean	**2.09**	**2,033**	**1.75**	**2,249**	**1.07**	**2,528**	**-2.48**	**2,514**	**5.79**	**2,446**	**3.30**	**2,959**	**1.92**	**2,455**
	sd	0.00	67	0.01	63	0.07	117	0.15	298	0.14	339	0.10	309	0.08	199
	max	2.19	2,120	2.11	2,313	9.32	2,656	15.75	2,794	20.57	2,880	18.03	3,396	20.57	3,396
	min	2.00	1,949	0.46	2,164	-8.35	2,420	-24.82	2,155	-16.32	2,064	-5.53	2,618	-24.82	1,949
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
mex	mean	**2.21**	**1,431**	**2.37**	**1,644**	**0.01**	**1,719**	**0.74**	**1,783**	**0.17**	**1,844**	**-0.76**	**1,878**	**0.79**	**1,716**
	sd	0.08	69	0.04	34	0.00	20	0.00	21	0.02	25	0.05	85	0.03	42
	max	9.54	1,492	8.80	1,680	0.80	1,744	0.74	1,810	1.81	1,884	4.45	1,991	9.54	1,991
	min	-8.41	1,348	-2.20	1,594	0.67	1,694	0.73	1,757	-3.19	1,823	-6.02	1,757	-8.41	1,348
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
per	mean	**1.64**	**853**	**1.69**	**920**	**0.00**	**997**	**7.04**	**1,180**	**0.00**	**1,185**	**4.12**	**1,389**	**2.41**	**1,087**
	sd	0.02	21	0.02	23	0.06	47	0.13	131	0.23	191	0.10	181	0.09	99
	max	4.95	872	4.52	949	3.32	1,037	25.37	1,318	24.20	1,331	10.33	1,619	25.37	1,619
	min	-0.34	817	-0.44	884	-11.24	927	-4.69	974	-36.29	926	-12.99	1,157	-36.29	817
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
ven	mean	**1.62**	**853**	**-0.26**	**832**	**0.02**	**969**	**0.54**	**1,002**	**10.12**	**1,336**	**14.86**	**2,763**	**4.48**	**1,292**
	sd	0.06	46	0.05	34	0.10	81	0.09	61	0.07	190	0.06	517	0.07	155
	max	7.17	913	5.91	865	13.76	1,104	14.94	1,069	17.67	1,630	24.44	3,426	24.44	3,426
	min	-4.16	797	-7.43	793	-14.33	886	-7.33	921	2.18	1,173	10.19	2,081	-14.33	793
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30

Table B.4: Growth rates and GDP per capita for the mineral group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Countries		1930-1934		1935-1939		1940-1944		1945-1949		1950-1954	
		g	y	g	y	g	y	g	y	g	y
Industrializers	mean	**-1.76**	**2,322**	**2.55**	**2,581**	**1.29**	**2,721**	**2.51**	**3,093**	**2.03**	**3,401**
	sd	0.10	231	0.03	94	0.04	111	0.04	173	0.02	132
	max	15.79	4,301	9.44	4,148	10.69	4,579	9.22	5,252	6.59	5,391
	min	-29.80	1,004	-3.20	1,150	-9.83	1,229	-8.71	1,390	-7.27	1,672
	obs	30	30	30	30	30	30	30	30	30	30
arg	mean	**-2.55**	**3,756**	**1.52**	**4,041**	**1.98**	**4,302**	**1.95**	**4,882**	**-0.27**	**4,926**
	sd	0.07	217	0.03	105	0.04	167	0.06	364	0.04	136
	max	5.99	4,080	5.31	4,148	9.06	4,579	8.71	5,252	3.28	5,073
	min	-9.45	3,522	-1.30	3,912	-2.41	4,161	-4.99	4,356	-7.27	4,717
	obs	5	5	5	5	5	5	5	5	5	5
bra	mean	**0.09**	**1,058**	**2.01**	**1,235**	**1.86**	**1,308**	**3.60**	**1,533**	**2.15**	**1,752**
	sd	0.06	55	0.03	50	0.06	69	0.03	102	0.01	69
	max	6.01	1,142	7.14	1,276	10.69	1,386	7.68	1,659	3.49	1,848
	min	-8.17	1,004	-1.04	1,150	-6.12	1,229	0.29	1,390	0.75	1,672
	obs	5	5	5	5	5	5	5	5	5	5
chl	mean	**-2.64**	**2,676**	**1.32**	**3,121**	**1.28**	**3,315**	**1.84**	**3,681**	**1.98**	**3,998**
	sd	0.18	383	0.03	100	0.02	84	0.07	137	0.02	143
	max	15.39	3,143	5.89	3,241	3.59	3,400	9.22	3,806	3.57	4,159
	min	-29.80	2,274	-3.20	2,987	-1.66	3,205	-8.71	3,470	-1.41	3,821
	obs	5	5	5	5	5	5	5	5	5	5
col	mean	**0.28**	**1,507**	**4.44**	**1,784**	**-0.45**	**1,852**	**2.47**	**2,023**	**2.25**	**2,230**
	sd	0.04	50	0.03	90	0.03	41	0.02	77	0.01	88
	max	4.27	1,577	9.44	1,905	3.89	1,895	6.02	2,107	3.53	2,358
	min	-3.30	1,448	0.37	1,677	-2.46	1,792	0.41	1,899	-0.13	2,150
	obs	5	5	5	5	5	5	5	5	5	5
mex	mean	**-2.20**	**1,542**	**3.32**	**1,775**	**3.01**	**2,009**	**1.30**	**2,224**	**2.45**	**2,478**
	sd	0.11	109	0.03	72	0.03	115	0.02	62	0.04	88
	max	8.95	1,643	6.31	1,858	5.14	2,159	3.53	2,304	6.59	2,605
	min	-17.99	1,373	-0.09	1,660	-0.33	1,852	-1.20	2,134	-2.63	2,365
	obs	5	5	5	5	5	5	5	5	5	5
ury	mean	**-3.56**	**3,394**	**2.73**	**3,529**	**0.07**	**3,543**	**3.91**	**4,214**	**3.60**	**5,020**
	sd	0.16	574	0.02	148	0.07	191	0.03	296	0.02	269
	max	15.79	4,301	6.00	3,692	10.64	3,705	8.15	4,504	6.15	5,391
	min	-20.61	2,750	0.09	3,356	-9.83	3,331	1.58	3,764	0.03	4,659
	obs	5	5	5	5	5	5	5	5	5	5

Table B.5: Growth rates and GDP per capita for the industrializers group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Countries		1955-1959		1960-1964		1965-1969		1970-1974		1930-1974	
		g	y	g	y	g	y	g	y	g	y
Industrializers	mean	**1.13**	**3,689**	**2.02**	**3,908**	**2.41**	**4,304**	**2.93**	**4,948**	**1.68**	**3,441**
	sd	0.04	145	0.03	128	0.03	190	0.02	284	0.04	165
	max	7.67	5,698	8.28	5,926	8.52	7,037	9.24	8,334	15.79	8,334
	min	-10.59	1,896	-3.99	2,335	-5.23	2,448	-7.56	3,057	-29.80	1,004
	obs	30	30	30	30	30	30	30	30	270	270
arg	mean	**1.02**	**5,384**	**2.46**	**5,696**	**3.44**	**6,541**	**3.38**	**7,753**	**1.44**	**5,254**
	sd	0.05	198	0.06	198	0.03	294	0.01	403	0.04	231
	max	5.04	5,698	8.28	5,926	7.23	7,037	4.57	8,334	9.06	8,334
	min	-8.35	5,237	-3.99	5,455	-0.79	6,321	1.38	7,302	-9.45	3,522
	obs	5	5	5	5	5	5	5	5	45	45
bra	mean	**3.68**	**2,030**	**2.14**	**2,444**	**2.91**	**2,619**	**7.12**	**3,568**	**2.84**	**1,949**
	sd	0.03	135	0.03	66	0.03	164	0.02	421	0.03	126
	max	5.71	2,221	5.00	2,511	5.72	2,860	9.24	4,083	10.69	4,083
	min	-1.53	1,896	-1.92	2,335	-0.97	2,448	5.05	3,057	-8.17	1,004
	obs	5	5	5	5	5	5	5	5	45	45
chl	mean	**0.26**	**4,135**	**2.43**	**4,528**	**2.36**	**5,049**	**-0.89**	**5,318**	**0.88**	**3,980**
	sd	0.04	147	0.02	166	0.04	251	0.05	261	0.05	186
	max	7.67	4,282	3.88	4,694	8.52	5,281	6.75	5,663	15.39	5,663
	min	-3.01	3,954	-0.02	4,320	-1.33	4,631	-7.56	5,050	-29.80	2,274
	obs	5	5	5	5	5	5	5	5	45	45
col	mean	**0.95**	**2,404**	**1.57**	**2,581**	**2.14**	**2,815**	**3.91**	**3,352**	**1.95**	**2,283**
	sd	0.02	40	0.01	67	0.01	112	0.01	214	0.02	87
	max	3.74	2,473	2.95	2,675	3.51	2,976	4.92	3,618	9.44	3,618
	min	-0.73	2,373	0.13	2,497	0.52	2,689	3.18	3,094	-3.30	1,448
	obs	5	5	5	5	5	5	5	5	45	45
mex	mean	**2.93**	**2,918**	**3.50**	**3,295**	**3.05**	**3,939**	**3.57**	**4,626**	**2.33**	**2,756**
	sd	0.02	122	0.03	182	0.00	194	0.02	298	0.03	138
	max	5.13	3,025	7.24	3,594	3.76	4,185	5.25	5,003	8.95	5,003
	min	-0.29	2,742	0.53	3,155	2.73	3,702	0.99	4,320	-17.99	1,373
	obs	5	5	5	5	5	5	5	5	45	45
ury	mean	**-2.07**	**5,261**	**-0.01**	**4,906**	**0.54**	**4,859**	**0.52**	**5,071**	**0.64**	**4,422**
	sd	0.05	226	0.02	89	0.04	125	0.03	105	0.05	225
	max	1.29	5,402	2.05	5,036	5.01	4,991	3.80	5,184	15.79	5,402
	min	-10.59	4,860	-3.60	4,820	-5.23	4,721	-3.68	4,945	-20.61	2,750
	obs	5	5	5	5	5	5	5	5	45	45

Table B.6: Growth rates and GDP per capita for the industrializers group (continued).

Countries		1930-1934		1935-1939		1940-1944		1945-1949		1950-1954	
		g	y	g	y	g	y	g	y	g	y
Non-industrializers	mean	**-2.76**	**1,533**	**3.13**	**1,678**	**0.84**	**1,733**	**2.20**	**2,028**	**1.79**	**2,271**
	sd	0.13	176	0.09	168	0.10	167	0.07	177	0.04	119
	max	28.27	3,444	29.75	4,305	28.02	4,309	19.24	7,544	12.65	8,417
	min	-23.89	823	-27.05	972	-42.26	970	-16.31	1,042	-14.94	1,027
	obs	40	40	40	43	51	52	63	67	81	85
bol	mean							**0.78**	**1,714**	**0.63**	**1,912**
	sd							0.00	21	0.08	111
	max							0.98	1,743	9.62	2,031
	min							0.58	1,690	-12.06	1,799
	obs							4	5	5	5
cri	mean	**-1.92**	**1,544**	**5.24**	**1,734**	**-4.94**	**1,702**	**7.51**	**1,925**	**1.50**	**2,134**
	sd	0.12	109	0.04	161	0.10	175	0.05	226	0.08	184
	max	15.56	1,660	11.87	1,876	9.72	1,943	14.60	2,123	10.71	2,353
	min	-14.45	1,421	-0.48	1,527	-14.08	1,459	1.36	1,614	-7.85	1,951
	obs	5	5	5	5	5	5	5	5	5	5
cub	mean	**-6.30**	**1,192**	**3.30**	**1,498**	**2.89**	**1,440**	**3.66**	**1,918**	**-0.02**	**2,057**
	sd	0.16	206	0.17	179	0.20	180	0.10	131	0.09	133
	max	14.20	1,505	13.73	1,779	28.02	1,631	11.33	2,121	6.13	2,207
	min	-23.89	977	-27.05	1,358	-19.08	1,208	-14.06	1,776	-14.94	1,900
	obs	5	5	5	5	5	5	5	5	5	5
dom	mean									**2.83**	**1,118**
	sd									0.05	56
	max									8.38	1,172
	min									-4.34	1,027
	obs									4	5
ecu	mean				**1,301**	**2.51**	**1,401**	**4.66**	**1,692**	**2.45**	**1,962**
	sd					0.05	77	0.06	187	0.04	111
	max				1,301	9.41	1,494	10.09	1,880	9.05	2,103
	min				1,301	-2.49	1,323	-2.11	1,443	-1.50	1,835
	obs				1	5	5	5	5	5	5
gtm	mean	**-2.59**	**1,529**	**9.71**	**2,181**	**-6.88**	**2,389**	**3.85**	**1,962**	**-0.79**	**2,051**
	sd	0.10	174	0.13	280	0.21	550	0.07	139	0.01	21
	max	10.76	1,776	29.75	2,457	11.00	2,825	14.51	2,111	0.69	2,085
	min	-16.05	1,358	-4.40	1,712	-42.26	1,741	-1.37	1,732	-1.51	2,029
	obs	5	5	5	5	5	5	5	5	5	5
hnd	mean	**-4.27**	**1,395**	**-1.65**	**1,110**	**-2.07**	**1,065**	**5.30**	**1,295**	**-0.17**	**1,347**
	sd	0.07	165	0.05	29	0.06	77	0.08	47	0.05	47
	max	4.20	1,564	3.84	1,135	3.94	1,160	19.24	1,333	4.67	1,421
	min	-13.04	1,211	-6.50	1,063	-11.49	1,006	-1.54	1,219	-8.92	1,300
	obs	5	5	5	5	5	5	5	5	5	5

Table B.7: Growth rates and GDP per capita for the non-industrializers group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Countries		1955-1959		1960-1964		1965-1969		1970-1974		1930-1974	
		g	y	g	y	g	y	g	y	g	y
Non-industrializers	mean	**1.94**	**2,627**	**2.18**	**2,894**	**2.16**	**3,310**	**2.83**	**3,778**	**1.59**	**2,428**
	sd	0.04	151	0.03	140	0.03	144	0.02	176	0.06	158
	max	15.87	10,058	12.41	9,646	9.48	10,262	10.21	10,672	29.75	10,672
	min	-13.38	1,011	-8.85	931	-16.46	860	-5.52	906	-42.26	823
	obs	85	85	83	85	85	85	85	85	613	627
bol	mean	**-2.66**	**1,673**	**2.24**	**1,669**	**3.70**	**1,971**	**2.64**	**2,283**	**1.22**	**1,871**
	sd	0.04	112	0.02	70	0.02	130	0.01	102	0.03	91
	max	2.99	1,853	3.92	1,762	5.78	2,120	4.18	2,418	9.62	2,418
	min	-8.29	1,575	-0.20	1,603	1.95	1,806	1.28	2,176	-12.06	1,575
	obs	5	5	3	5	5	5	5	5	27	30
cri	mean	**2.53**	**2,474**	**2.62**	**2,821**	**4.03**	**3,371**	**4.03**	**4,102**	**2.29**	**2,423**
	sd	0.06	130	0.02	113	0.01	195	0.01	283	0.05	175
	max	7.95	2,605	4.70	2,961	5.42	3,622	5.72	4,430	15.56	4,430
	min	-6.67	2,301	0.26	2,715	2.73	3,127	2.55	3,754	-14.45	1,421
	obs	5	5	5	5	5	5	5	5	45	45
cub	mean	**1.09**	**2,197**	**-0.56**	**2,038**	**0.11**	**2,078**	**2.80**	**2,124**	**0.78**	**1,838**
	sd	0.09	179	0.00	18	0.06	101	0.05	163	0.10	143
	max	11.52	2,406	-0.09	2,052	9.14	2,248	6.89	2,324	28.02	2,406
	min	-13.38	2,005	-1.10	2,009	-7.75	1,988	-5.26	1,917	-27.05	977
	obs	5	5	5	5	5	5	5	5	45	45
dom	mean	**2.20**	**1,268**	**2.90**	**1,370**	**-0.43**	**1,366**	**7.05**	**1,830**	**2.91**	**1,390**
	sd	0.03	53	0.06	102	0.10	71	0.02	213	0.06	99
	max	6.31	1,320	12.41	1,484	9.48	1,453	8.96	2,067	12.41	2,067
	min	-2.78	1,183	-5.60	1,232	-16.46	1,259	3.02	1,561	-16.46	1,027
	obs	5	5	5	5	5	5	5	5	24	25
ecu	mean	**1.00**	**2,150**	**1.73**	**2,326**	**2.55**	**2,629**	**4.22**	**3,090**	**2.73**	**2,069**
	sd	0.01	42	0.02	52	0.02	77	0.03	235	0.03	112
	max	2.41	2,211	3.83	2,411	6.22	2,739	8.83	3,383	10.09	3,383
	min	-0.10	2,101	-0.44	2,279	-0.40	2,556	2.65	2,845	-2.49	1,301
	obs	5	5	5	5	5	5	5	5	35	36
gtm	mean	**2.27**	**2,172**	**1.89**	**2,363**	**2.49**	**2,675**	**3.09**	**3,096**	**1.45**	**2,269**
	sd	0.02	98	0.03	106	0.02	125	0.01	163	0.07	184
	max	5.79	2,273	6.27	2,498	5.56	2,830	3.99	3,303	29.75	3,303
	min	-0.48	2,019	-0.51	2,262	1.19	2,534	2.37	2,905	-42.26	1,358
	obs	5	5	5	5	5	5	5	5	45	45
hnd	mean	**0.91**	**1,350**	**1.31**	**1,417**	**1.93**	**1,585**	**-0.32**	**1,610**	**0.11**	**1,353**
	sd	0.02	33	0.01	26	0.03	43	0.02	25	0.04	55
	max	4.62	1,372	2.73	1,452	4.99	1,639	1.44	1,642	19.24	1,642
	min	-0.74	1,293	-0.78	1,387	-2.47	1,526	-4.21	1,574	-13.04	1,006
	obs	5	5	5	5	5	5	5	5	45	45

Table B.8: Growth rates and GDP per capita for the non-industrializers group (continued)

Countries		1930-1934		1935-1939		1940-1944		1945-1949		1950-1954	
		g	y	g	y	g	y	g	y	g	y
hti	mean							**0.02**	**1,045**	**1.05**	**1,066**
	sd							0.00	2	0.04	28
	max							0.56	1,048	6.08	1,102
	min							-0.27	1,042	-4.96	1,037
	obs							4	5	5	5
jam	mean				**972**	**16.95**	**1,060**	**-8.67**	**1,581**	**8.42**	**1,558**
	sd						127		97		215
	max				972	16.95	1,150	-8.67	1,649	11.72	1,858
	min				972	16.95	970	-8.67	1,512	6.24	1,327
	obs				1	1	2	1	2	4	5
nic	mean	**-5.90**	**1,330**	**-0.25**	**1,140**	**2.36**	**1,439**	**0.41**	**1,480**	**6.08**	**1,816**
	sd	0.16	110	0.16	137	0.07	54	0.05	48	0.05	164
	max	21.52	1,456	17.89	1,288	7.78	1,495	6.32	1,550	12.65	2,002
	min	-21.27	1,174	-25.55	997	-6.11	1,372	-4.78	1,423	-0.65	1,616
	obs	5	5	5	5	5	5	5	5	5	5
pan	mean							**-0.98**	**2,105**	**-0.38**	**1,926**
	sd								77	0.04	56
	max							2.09	2,200	3.54	1,993
	min							-8.33	2,024	-5.83	1,851
	obs							4	5	5	5
per	mean	**1.58**	**1,414**	**1.44**	**1,813**	**-0.52**	**1,811**	**3.61**	**2,082**	**3.61**	**2,459**
	sd	0.19	241	0.04	51	0.10	129	0.03	73	0.01	142
	max	28.27	1,753	6.97	1,884	11.07	1,998	8.85	2,199	5.28	2,634
	min	-14.30	1,148	-4.19	1,757	-12.86	1,643	0.97	2,005	2.63	2,263
	obs	5	5	5	5	5	5	5	5	5	5
pri	mean									**4.44**	**2,344**
	sd									0.01	175
	max									5.98	2,561
	min									2.83	2,144
	obs									4	5
pry	mean				**1,894**	**-1.10**	**1,776**	**-0.59**	**1,662**	**-3.03**	**1,533**
	sd				.	0.04	28	0.11	126	0.04	42
	max				1,894	3.35	1,800	13.24	1,815	0.18	1,584
	min				1,894	-7.77	1,741	-16.31	1,524	-9.38	1,495
	obs				1	5	5	5	5	5	5
slv	mean	**-0.02**	**931**	**0.02**	**1,017**	**0.02**	**1,143**	**0.06**	**1,356**	**0.01**	**1,545**
	sd	0.10	79	0.08	36	0.07	60	0.16	269	0.03	60
	max	0.11	1,045	0.08	1,065	0.07	1,235	0.23	1,707	0.05	1,616
	min	-0.12	823	-0.09	977	-0.07	1,074	-0.11	1,091	-0.02	1,480
	obs	5	5	5	5	5	5	5	5	5	5
tto	mean									**1.58**	**3,875**
	sd									0.03	115
	max									5.81	3,954
	min									-1.02	3,674
	obs									4	5
ven	mean	**-2.69**	**2,927**	**7.26**	**3,795**	**0.02**	**3,836**	**11.20**	**6,576**	**2.19**	**7,898**
	sd	0.12	320	0.03	472	0.13	381	0.06	1034	0.03	363
	max	8.02	3,444	12.18	4,305	18.68	4,309	16.90	7,544	5.63	8,417
	min	-22.37	2,613	3.81	3,181	-15.37	3,347	2.00	5,102	-1.09	7,462
	obs	5	5	5	5	5	5	5	5	5	5

Table B.9: Growth rates and GDP per capita for the non-industrializers group (continued)

Countries		1955-1959		1960-1964		1965-1969		1970-1974		1930-1974	
		g	y	g	y	g	y	g	y	g	y
hti	mean	**-1.73**	**1,053**	**-1.64**	**1,003**	**-1.04**	**888**	**3.74**	**984**	**0.07**	**1,006**
	sd	0.07	41	0.07	56	0.03	23	0.01	60	0.04	35
	max	6.49	1,108	7.07	1,064	1.74	922	5.25	1,066	7.07	1,108
	min	-8.05	1,011	-8.85	931	-4.19	860	2.46	906	-8.85	860
	obs	5	5	5	5	5	5	5	5	29	30
jam	mean	**6.26**	**2,336**	**2.67**	**2,748**	**3.62**	**3,228**	**2.32**	**3,910**	**4.51**	**2,174**
	sd		221		95		161		129		149
	max	11.96	2,541	5.19	2,904	5.81	3,480	10.06	4,130	16.95	4,130
	min	-0.41	2,020	0.74	2,654	1.56	3,070	-5.52	3,803	-8.67	970
	obs	5	5	5	5	5	5	5	5	26	30
nic	mean	**0.17**	**2,052**	**4.89**	**2,245**	**2.19**	**2,793**	**2.36**	**2,937**	**1.37**	**1,915**
	sd	0.04	41	0.04	240	0.03	62	0.05	171	0.07	114
	max	5.00	2,111	7.88	2,578	5.90	2,875	10.21	3,236	21.52	3,236
	min	-3.13	2,008	-1.79	1,983	-1.82	2,734	-2.24	2,812	-25.55	997
	obs	5	5	5	5	5	5	5	5	45	45
pan	mean	**3.06**	**2,199**	**4.59**	**2,695**	**4.73**	**3,385**	**2.69**	**4,084**	**2.28**	**2,732**
	sd	0.03	113	0.02	220	0.01	244	0.02	179	0.02	148
	max	7.40	2,322	7.36	2,920	5.50	3,699	5.06	4,250	7.40	4,250
	min	-1.28	2,055	1.32	2,391	4.14	3,085	-0.44	3,814	-8.33	1,851
	obs	5	5	5	5	5	5	5	5	29	30
per	mean	**1.00**	**2,754**	**4.47**	**3,261**	**1.32**	**3,675**	**2.55**	**3,935**	**2.12**	**2,578**
	sd	0.03	54	0.03	173	0.03	87	0.02	157	0.05	123
	max	3.78	2,836	8.78	3,462	5.28	3,757	6.09	4,200	28.27	4,200
	min	-3.21	2,689	0.74	3,023	-2.46	3,532	0.03	3,807	-14.30	1,148
	obs	5	5	5	5	5	5	5	5	45	45
pri	mean	**4.70**	**2,940**	**6.13**	**3,916**	**5.66**	**5,256**	**4.32**	**6,894**	**5.05**	**4,270**
	sd	0.03	217	0.01	394	0.01	431	0.03	404	0.02	324
	max	7.61	3,239	7.93	4,401	6.98	5,840	8.35	7,302	8.35	7,302
	min	1.13	2,649	4.65	3,421	3.71	4,719	-0.75	6,349	-0.75	2,144
	obs	5	5	5	5	5	5	5	5	24	25
pry	mean	**1.11**	**1,571**	**1.30**	**1,629**	**1.40**	**1,764**	**3.39**	**1,980**	**0.35**	**1,726**
	sd	0.02	39	0.02	55	0.02	39	0.01	111	0.04	63
	max	2.95	1,625	4.24	1,687	3.53	1,810	5.07	2,144	13.24	2,144
	min	-2.78	1,523	-1.63	1,555	-1.54	1,712	1.59	1,872	-16.31	1,495
	obs	5	5	5	5	5	5	5	5	35	36
slv	mean	**0.02**	**1,708**	**0.03**	**1,890**	**0.01**	**2,181**	**0.02**	**2,297**	**0.02**	**1,563**
	sd	0.02	50	0.04	125	0.02	48	0.02	99	0.06	92
	max	0.05	1,748	0.08	2,058	0.03	2,216	0.04	2,436	0.23	2,436
	min	-0.01	1,624	0.00	1,764	0.00	2,101	-0.01	2,187	-0.12	823
	obs	5	5	5	5	5	5	5	5	45	45
tto	mean	**7.67**	**5,214**	**3.38**	**6,531**	**2.99**	**7,434**	**2.73**	**8,576**	**3.67**	**6,326**
	sd	0.05	566	0.03	230	0.01	350	0.02	334	0.03	319
	max	15.87	5,743	8.48	6,801	4.75	7,897	4.30	9,053	15.87	9,053
	min	2.36	4,316	1.22	6,251	1.27	7,030	0.33	8,244	-1.02	3,674
	obs	5	5	5	5	5	5	5	5	24	25
ven	mean	**3.44**	**9,549**	**-0.89**	**9,280**	**1.41**	**9,990**	**0.47**	**10,499**	**2.49**	**7,150**
	sd	0.04	581	0.04	301	0.02	258	0.03	168	0.06	431
	max	9.75	10,058	4.58	9,646	3.25	10,262	3.91	10,672	18.68	10,672
	min	-2.43	8,750	-6.91	9,002	-1.68	9,677	-2.14	10,245	-22.37	2,613
	obs	5	5	5	5	5	5	5	5	45	45

Table B.10: Growth rates and GDP per capita for the non-industrializers group (continued)

Countries		1975-1979		1980-1984		1985-1989		1990-1994		1995-1999		2000-2004		1975-2004	
		g	y	g	y	g	y	g	y	g	y	g	y	g	y
Good institutions	mean	**0.02**	**5315**	**-0.01**	**5551**	**0.01**	**5573**	**0.03**	**6124**	**0.02**	**6,948**	**0.01**	**7,181**	**0.01**	**6,115**
	sd	0.04	1069	0.04	1108	0.03	1085	0.03	1298	0.04	1417	0.03	1285	0.03	1210
	max	0.08	8304	0.06	8206	0.08	7299	0.09	8367	0.14	9,585	0.07	11,462	0.14	11,462
	min	-0.16	3622	-0.17	4185	-0.08	4282	-0.06	4736	-0.08	5,131	-0.13	5,246	-0.17	3,622
	obs	35	35	35	35	35	35	35	35	35	35	35	35	210	210
arg	mean	**0.00**	**8085**	**-0.02**	**7572**	**-0.03**	**6987**	**0.05**	**7421**	**0.01**	**8668**	**0.00**	**8245**	**0.00**	**7830**
	sd	0.05	201	0.04	377	0.06	315	0.04	747	0.05	482	0.07	454	0.05	429
	max	0.05	8304	0.02	8206	0.06	7299	0.08	8367	0.07	9215	0.07	8695	0.08	9215
	min	-0.06	7807	-0.08	7243	-0.08	6523	-0.01	6436	-0.04	8005	-0.08	7594	-0.08	6436
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
bra	mean	**0.04**	**4560**	**-0.01**	**4792**	**0.02**	**5156**	**0.00**	**4944**	**0.01**	**5399**	**0.01**	**5628**	**0.01**	**5080**
	sd	0.02	260	0.06	262	0.03	140	0.04	133	0.01	72	0.02	72	0.03	157
	max	0.07	4892	0.06	5198	0.06	5273	0.04	5163	0.03	5476	0.03	5747	0.07	5747
	min	0.02	4190	-0.07	4500	-0.02	4917	-0.06	4802	-0.01	5296	-0.01	5571	-0.07	4190
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
chl	mean	**0.01**	**4790**	**-0.01**	**5347**	**0.04**	**5682**	**0.05**	**7255**	**0.03**	**9243**	**0.04**	**10432**	**0.03**	**7125**
	sd	0.10	456	0.10	470	0.03	474	0.03	670	0.03	400	0.02	656	0.05	521
	max	0.08	5407	0.06	5956	0.08	6377	0.09	8010	0.07	9585	0.07	11462	0.09	11462
	min	-0.16	4323	-0.17	4898	0.01	5168	0.00	6402	-0.01	8612	0.02	9820	-0.17	4323
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
col	mean	**0.03**	**3873**	**0.00**	**4233**	**0.02**	**4548**	**0.02**	**4968**	**0.00**	**5399**	**0.02**	**5376**	**0.01**	**4733**
	sd	0.02	235	0.01	34	0.01	185	0.02	173	0.04	157	0.01	167	0.02	158
	max	0.06	4184	0.02	4265	0.04	4739	0.04	5240	0.03	5542	0.03	5636	0.06	5636
	min	0.00	3622	-0.01	4185	0.01	4282	0.00	4821	-0.06	5131	0.00	5246	-0.06	3622
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
cri	mean	**0.02**	**4700**	**-0.02**	**4498**	**0.01**	**4515**	**0.02**	**4961**	**0.05**	**5591**	**-0.01**	**6182**	**0.01**	**5074**
	sd	0.02	240	0.05	296	0.02	133	0.02	224	0.06	587	0.04	182	0.04	277
	max	0.06	4959	0.05	4911	0.03	4698	0.05	5237	0.14	6571	0.06	6335	0.14	6571
	min	-0.01	4396	-0.10	4230	-0.02	4340	0.00	4736	-0.02	5138	-0.05	5957	-0.10	4230
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
mex	mean	**0.03**	**5433**	**0.01**	**6343**	**-0.01**	**5937**	**0.02**	**6330**	**0.01**	**6442**	**0.01**	**7037**	**0.01**	**6254**
	sd	0.02	327	0.05	243	0.03	164	0.01	154	0.05	327	0.03	93	0.03	218
	max	0.06	5941	0.06	6683	0.02	6218	0.03	6536	0.04	6816	0.05	7157	0.06	7157
	min	0.01	5146	-0.06	6082	-0.06	5810	0.00	6119	-0.08	6027	-0.02	6950	-0.08	5146
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
ury	mean	**0.04**	**5761**	**-0.02**	**6076**	**0.03**	**6187**	**0.03**	**6987**	**0.01**	**7895**	**-0.01**	**7367**	**0.01**	**6712**
	sd	0.02	315	0.06	532	0.04	393	0.02	447	0.04	370	0.09	535	0.05	432
	max	0.06	6234	0.05	6668	0.08	6462	0.06	7567	0.04	8330	0.11	7861	0.11	8330
	min	0.01	5421	-0.11	5520	-0.01	5567	0.00	6474	-0.04	7365	-0.13	6632	-0.13	5421
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30

Table B.11: Growth rates and GDP per capita for the good institutions group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Countries		1975-1979		1980-1984		1985-1989		1990-1994		1995-1999		2000-2004		1975-2004	
		g	y	g	y	g	y	g	y	g	y	g	y	g	y
Vulnerable	mean	**0.03**	**4182**	**0.01**	**4456**	**0.03**	**4601**	**0.01**	**4856**	**0.03**	**5,335**	**0.02**	**5,675**	**0.02**	**4,851**
	sd	0.05	362	0.05	220	0.04	312	0.04	240	0.03	306	0.03	298	0.05	290
	max	0.16	12781	0.21	13471	0.14	13969	0.23	13824	0.11	14,423	0.13	16,627	0.23	16,627
	min	-0.21	945	-0.14	1133	-0.19	1063	-0.18	753	-0.03	777	-0.09	744	-0.21	744
	obs	59	66	74	75	75	76	80	80	80	80	70	70	438	447
bhs	mean	**0.10**	**10079**	**0.01**	**12410**	**0.01**	**13843**	**-0.03**	**12962**	**0.02**	**12630**	**0.00**	**13457**	**0.02**	**12563**
	sd	0.06	1779	0.08	775	0.01	88	0.02	660	0.02	476	0.04	270	0.04	675
	max	0.16	12781	0.11	13471	0.02	13969	0.00	13824	0.04	13219	0.04	13767	0.16	13969
	min	0.03	8518	-0.10	11689	0.00	13739	-0.05	12162	-0.02	11973	-0.03	13272	-0.10	8518
	obs	4	5	5	5	5	5	5	5	5	5	3	3	27	28
blz	mean	**0.01**	**2164**	**0.01**	**2395**	**0.05**	**2534**	**0.05**	**3594**	**0.01**	**3750**	**0.05**	**4778**	**0.03**	**3203**
	sd	0.04	74	0.05	69	0.06	281	0.05	322	0.04	138	0.05	280	0.05	194
	max	0.05	2263	0.09	2474	0.11	2960	0.10	3886	0.08	3996	0.10	5126	0.11	5126
	min	-0.04	2087	-0.04	2320	-0.01	2279	-0.02	3116	-0.03	3673	-0.03	4421	-0.04	2087
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
brb	mean	**0.04**	**7854**	**0.00**	**8720**	**0.04**	**9806**	**-0.02**	**9648**	**0.03**	**10503**			**0.02**	**9306**
	sd	0.04	575	0.06	400	0.05	764	0.05	311	0.02	613			0.04	533
	max	0.08	8736	0.07	9364	0.11	10671	0.03	9973	0.05	11254			0.11	11254
	min	-0.01	7327	-0.06	8350	0.00	8651	-0.07	9268	0.01	9828			-0.07	7327
	obs	4	5	5	5	5	5	5	5	5	5			24	25
cub	mean	**0.03**	**2541**	**0.02**	**2869**	**0.00**	**3005**	**-0.09**	**2291**	**0.04**	**2121**	**0.04**	**2549**	**0.01**	**2563**
	sd	0.01	127	0.03	141	0.01	29	0.09	474	0.03	135	0.02	126	0.03	172
	max	0.05	2695	0.07	3020	0.01	3045	0.01	2948	0.08	2297	0.05	2738	0.08	3045
	min	0.01	2404	-0.02	2644	-0.02	2975	-0.18	1844	0.01	1925	0.02	2414	-0.18	1844
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
dma	mean	**-0.05**	**1137**	**0.07**	**1315**	**0.06**	**1760**	**0.02**	**2100**	**0.03**	**2411**	**-0.02**	**2448**	**0.02**	**1862**
	sd	0.23	121	0.03	124	0.03	176	0.01	60	0.02	138	0.05	151	0.06	128
	max	0.11	1261	0.12	1476	0.09	1949	0.04	2184	0.06	2601	0.04	2701	0.12	2701
	min	-0.21	1019	0.04	1145	0.02	1551	0.01	2023	0.01	2230	-0.09	2334	-0.21	1019
	obs	2	3	5	5	5	5	5	5	5	5	5	5	27	28
dom	mean	**0.02**	**2219**	**0.01**	**2408**	**0.02**	**2417**	**0.00**	**2533**	**0.05**	**3026**	**0.02**	**3723**	**0.02**	**2721**
	sd	0.01	68	0.02	28	0.06	143	0.04	74	0.02	280	0.03	81	0.03	112
	max	0.04	2289	0.04	2450	0.10	2649	0.04	2629	0.06	3401	0.06	3804	0.10	3804
	min	0.00	2111	-0.02	2372	-0.05	2292	-0.07	2446	0.03	2703	-0.02	3610	-0.07	2111
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30

Table B.12: Growth rates and GDP per capita for the vulnerable group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Countries		1975-1979		1980-1984		1985-1989		1990-1994		1995-1999		2000-2004		1975-2004	
		g	y	g	y	g	y	g	y	g	y	g	y	g	y
grd	mean						**2948**	**0.00**	**3033**	**0.05**	**3419**	**0.01**	**4175**	**0.02**	**3394**
	sd							0.03	64	0.03	332	0.04	63	0.03	153
	max						2948	0.05	3113	0.09	3914	0.08	4247	0.09	4247
	min						2948	-0.02	2955	0.03	3088	-0.03	4097	-0.03	2948
	obs						1	5	5	5	5	5	5	15	16
guy	mean	**-0.01**	**2963**	**-0.02**	**2778**	**0.04**	**2812**	**0.00**	**2972**	**0.03**	**3370**	**0.00**	**3476**	**0.00**	**3062**
	sd	0.03	95	0.07	223	0.08	210	0.04	55	0.05	190	0.02	54	0.05	138
	max	0.03	3088	0.06	3086	0.13	3052	0.04	3021	0.08	3570	0.03	3534	0.13	3570
	min	-0.04	2844	-0.12	2552	-0.07	2578	-0.05	2892	-0.03	3086	-0.02	3422	-0.12	2552
	obs	4	5	5	5	5	5	5	5	5	5	5	5	29	30
hti	mean	**0.03**	**1124**	**-0.01**	**1224**	**-0.02**	**1098**	**-0.07**	**905**	**0.02**	**805**	**-0.02**	**784**	**-0.01**	**990**
	sd	0.04	69	0.04	56	0.01	35	0.06	125	0.01	19	0.01	28	0.03	55
	max	0.07	1221	0.07	1304	-0.01	1146	-0.02	1041	0.03	827	-0.01	818	0.07	1304
	min	-0.03	1032	-0.05	1168	-0.03	1063	-0.16	753	0.01	777	-0.04	744	-0.16	744
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
jam	mean	**-0.03**	**3527**	**-0.01**	**3150**	**0.02**	**3160**	**0.02**	**3650**	**-0.01**	**3610**	**0.01**	**3700**	**0.00**	**3466**
	sd	0.03	195	0.03	27	0.05	206	0.02	55	0.02	88	0.01	81	0.03	108
	max	0.00	3845	0.01	3188	0.07	3449	0.05	3722	0.01	3753	0.02	3770	0.07	3845
	min	-0.08	3336	-0.07	3121	-0.06	2953	-0.01	3588	-0.03	3539	-0.01	3578	-0.08	2953
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
kna	mean	**0.07**	**1645**	**0.03**	**1847**	**0.10**	**2779**	**0.04**	**3683**	**0.04**	**4889**	**0.02**	**5300**	**0.05**	**3357**
	sd	0.02	124	0.07	107	0.01	453	0.03	315	0.05	431	0.02	210	0.03	273
	max	0.09	1775	0.14	2020	0.11	3396	0.07	4108	0.11	5308	0.06	5650	0.14	5650
	min	0.06	1529	-0.04	1761	0.09	2238	-0.01	3357	-0.03	4227	0.00	5112	-0.04	1529
	obs	2	3	5	5	5	5	5	5	5	5	5	5	27	28
lca	mean			**0.03**	**1261**	**0.05**	**1578**	**0.06**	**2420**	**0.01**	**2528**	**-0.01**	**2477**	**0.03**	**2053**
	sd			0.14	118	0.09	196	0.10	82	0.02	41	0.03	60	0.07	99
	max			0.21	1427	0.13	1829	0.23	2499	0.03	2579	0.03	2559	0.23	2579
	min			-0.14	1133	-0.07	1326	-0.01	2312	-0.01	2480	-0.05	2416	-0.14	1133
	obs			4	5	5	5	5	5	5	5	5	5	24	25
pan	mean	**0.01**	**4282**	**0.03**	**5226**	**-0.03**	**4979**	**0.04**	**4987**	**0.03**	**5645**	**0.02**	**6172**	**0.02**	**5215**
	sd	0.04	179	0.06	111	0.09	519	0.02	354	0.03	352	0.05	317	0.05	305
	max	0.08	4518	0.12	5372	0.03	5394	0.07	5329	0.06	6100	0.07	6673	0.12	6673
	min	-0.02	4102	-0.02	5091	-0.19	4361	0.01	4476	-0.01	5306	-0.03	5837	-0.19	4102
	obs	5	5	5	5	5	5	5	5	5	5	5	5	30	30
pri	mean	**0.02**	**7489**	**0.00**	**8061**	**0.04**	**9355**	**0.03**	**11165**	**0.04**	**13256**	**0.04**	**14965**	**0.03**	**10715**
	sd	0.04	505	0.04	222	0.02	733	0.01	571	0.03	935	0.07	948	0.07	948
	max	0.05	8164	0.06	8283	0.07	10246	0.04	11913	0.08	14423	0.09	15636	0.04	8164
	min	-0.04	6946	-0.04	7797	0.01	8373	0.02	10539	0.01	12341	-0.01	14295	-0.06	60291
	obs	5	5	5	5	5	5	5	5	5	5	2	2	5	5
tto	mean	**0.05**	**10446**	**-0.01**	**11826**	**-0.04**	**9760**	**0.02**	**9621**	**0.04**	**11163**	**0.06**	**14619**	**0.02**	**11239**
	sd	0.04	1043	0.07	809	0.02	662	0.02	272	0.02	612	0.05	1680	0.07	1680
	max	0.09	11649	0.06	12794	-0.01	10664	0.05	10032	0.06	12030	0.13	16627	-0.01	10032
	min	0.01	9118	-0.10	10794	-0.06	9112	0.00	9271	0.00	10503	0.02	12965	-0.13	61763
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
vct	mean	**0.06**	**1079**	**0.04**	**1346**	**0.06**	**1784**	**0.02**	**2139**	**0.02**	**2237**	**0.02**	**2496**	**0.04**	**1847**
	sd	0.04	104	0.02	87	0.07	191	0.03	44	0.02	118	0.03	118	0.07	191
	max	0.10	1204	0.06	1444	0.14	1981	0.06	2184	0.05	2404	0.05	2678	0.05	1204
	min	0.02	945	0.02	1223	0.00	1537	-0.02	2089	0.00	2133	-0.01	2400	-0.01	10327
	obs	4	5	5	5	5	5	5	5	5	5	5	5	5	5

Table B.13: Growth rates and GDP per capita for the vulnerable group (continued).

Countries		1975-1979		1980-1984		1985-1989		1990-1994		1995-1999		2000-2004		1975-2004	
		g	y	g	y	g	y	g	y	g	y	g	y	g	y
Painful	mean	**0.01**	**3880**	**-0.02**	**3619**	**-0.01**	**3357**	**0.01**	**3342**	**0.01**	**3,505**	**0.01**	**3,464**	**0.00**	**3,528**
	sd	0.04	210	0.04	214	0.04	142	0.03	117	0.03	100	0.03	130	0.03	152
	max	0.08	11251	0.11	10139	0.08	9080	0.11	9373	0.06	9,153	0.15	8,467	0.15	11,251
	min	-0.34	1570	-0.16	1774	-0.15	1512	-0.07	1308	-0.09	1,348	-0.10	1,442	-0.34	1,308
	obs	45	45	45	45	45	45	45	45	45	45	45	45	270	270
bol	mean	**0.02**	**2644**	**-0.03**	**2399**	**-0.01**	**2121**	**0.02**	**2267**	**0.01**	**2479**	**0.01**	**2573**	**0.00**	**2414**
	sd	0.03	77	0.03	159	0.03	42	0.01	54	0.02	65	0.01	56	0.03	159
	max	0.05	2715	-0.01	2572	0.02	2181	0.03	2343	0.03	2552	0.03	2662	-0.01	2181
	min	-0.02	2516	-0.06	2234	-0.05	2074	-0.01	2197	-0.01	2400	0.00	2529	-0.16	13951
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
ecu	mean	**0.04**	**3795**	**0.00**	**4064**	**0.00**	**3932**	**0.01**	**4009**	**0.00**	**4186**	**0.02**	**4349**	**0.01**	**4056**
	sd	0.02	236	0.03	110	0.06	145	0.01	70	0.03	86	0.02	172	0.06	236
	max	0.06	4060	0.02	4181	0.08	4048	0.02	4099	0.02	4301	0.05	4627	0.02	4048
	min	0.02	3459	-0.05	3922	-0.09	3697	0.00	3903	-0.05	4093	0.01	4194	-0.16	23267
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
gtm	mean	**0.02**	**3494**	**-0.03**	**3383**	**-0.01**	**2973**	**0.01**	**3085**	**0.02**	**3334**	**0.00**	**3494**	**0.00**	**3294**
	sd	0.02	163	0.03	243	0.02	35	0.01	64	0.00	94	0.01	10	0.03	243
	max	0.04	3661	0.01	3681	0.01	3011	0.02	3164	0.02	3458	0.01	3503	0.01	3011
	min	-0.01	3263	-0.07	3117	-0.03	2930	0.00	3009	0.01	3229	-0.01	3479	-0.11	19026
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
hnd	mean	**0.05**	**1798**	**-0.02**	**1850**	**0.01**	**1858**	**0.00**	**1921**	**-0.01**	**1921**	**0.02**	**1924**	**0.01**	**1879**
	sd	0.04	171	0.02	70	0.02	53	0.04	57	0.03	47	0.01	43	0.04	171
	max	0.07	1977	0.01	1930	0.03	1919	0.04	2011	0.01	1950	0.03	1991	0.01	1919
	min	0.00	1570	-0.04	1774	-0.02	1793	-0.05	1871	-0.05	1837	0.00	1887	-0.16	10731
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
nic	mean	**-0.08**	**2968**	**-0.01**	**2143**	**-0.06**	**1741**	**-0.03**	**1364**	**0.01**	**1374**	**0.01**	**1458**	**-0.03**	**1841**
	sd	0.16	471	0.03	47	0.05	189	0.02	58	0.02	29	0.02	18	0.16	471
	max	0.05	3350	0.02	2195	-0.03	1946	0.01	1454	0.05	1422	0.03	1481	-0.03	1422
	min	-0.34	2152	-0.04	2076	-0.14	1512	-0.05	1308	-0.01	1348	-0.02	1442	-0.61	9837
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
per	mean	**0.00**	**4133**	**-0.03**	**3971**	**-0.03**	**3695**	**0.01**	**3009**	**0.02**	**3564**	**0.02**	**3726**	**0.00**	**3683**
	sd	0.02	85	0.08	346	0.10	341	0.07	165	0.04	66	0.03	178	0.10	346
	max	0.03	4226	0.02	4283	0.07	4103	0.11	3296	0.06	3664	0.05	3992	0.02	3296
	min	-0.02	4008	-0.16	3559	-0.15	3183	-0.07	2868	-0.02	3504	-0.02	3542	-0.45	20664
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
pry	mean	**0.06**	**2543**	**0.01**	**3257**	**0.01**	**3147**	**0.00**	**3270**	**-0.01**	**3267**	**-0.01**	**3013**	**0.01**	**3083**
	sd	0.02	299	0.08	166	0.03	94	0.01	19	0.02	69	0.02	68	0.08	299
	max	0.08	2954	0.11	3498	0.03	3282	0.01	3287	0.02	3331	0.02	3084	0.01	2954
	min	0.03	2220	-0.06	3097	-0.03	3042	-0.01	3237	-0.03	3163	-0.04	2948	-0.14	17707
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
slv	mean	**0.01**	**2594**	**-0.04**	**2158**	**0.00**	**2099**	**0.03**	**2268**	**0.02**	**2617**	**0.00**	**2734**	**0.00**	**2412**
	sd	0.03	82	0.05	118	0.01	8	0.02	144	0.02	71	0.01	24	0.05	144
	max	0.04	2715	0.01	2354	0.01	2106	0.05	2459	0.04	2720	0.01	2761	0.01	2106
	min	-0.04	2504	-0.10	2076	-0.01	2089	0.01	2119	-0.01	2550	0.00	2708	-0.15	14046
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5
ven	mean	**0.01**	**10947**	**-0.05**	**9341**	**-0.01**	**8645**	**0.01**	**8882**	**-0.01**	**8803**	**0.00**	**7904**	**-0.01**	**9087**
	sd	0.03	303	0.03	663	0.06	367	0.05	420	0.06	377	0.10	605	0.10	663
	max	0.04	11251	-0.01	10139	0.03	9080	0.08	9373	0.05	9153	0.15	8467	-0.01	8467
	min	-0.02	10472	-0.07	8623	-0.11	8094	-0.06	8313	-0.09	8182	-0.10	6957	-0.46	50640
	obs	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Table B.14: Growth rates and GDP per capita for the painful group. Where g is the growth rate of GDP per capita in %, y is the GDP per capita in international $, mean is the average, sd the standard deviation, max and min are the maximum and minimum values, and obs is the number of observations.

Appendix C

Structural Reforms from the 90s

Year	Stabilization	Trade liberalization	Tax reform	Financial reform	Privatization	Labour reform	Pension reform
1985 (or before)	Argentina (1978 and 1985), Bolivia, Chile (1975 and 1985), Costa Rica, Peru, Uruguay (1978)	Argentina (1978), Chile (1975 and 1985) Mexico Uruguay (1978)		Argentina (1978), Chile (1975) Uruguay (1974 and 1985)	Chile (1974-78)	Chile (1979)	Chile (1981)
1986	Brazil Dom. Rep.	Bolivia Costa Rica		Mexico			
1987	Guatemala Jamaica	Jamaica			Jamaica		
1988	Mexico	Guatemala Guyana		Costa Rica Brazil Paraguay Guyana	Chile (circa 1988)		
1989	Venezuela	Argentina Paraguay El Salvador Trinidad and Tobago Venezuela		Chile Venezuela			
1990	Dom. Rep. Peru	Brazil Dom. Rep. Ecuador Honduras Peru		Bolivia Colombia El Salvador Nicaragua Peru Trinidad and Tobago	Argentina	Colombia Guatemala	

Table C.1: Structural Reform Policies in Latin America. Taken from Thorp (1998)

Year	Stabilization	Trade liberalization	Tax reform	Financial reform	Privatization	Labour reform	Pension reform
1991	Argentina Colombia Guatemala Nicaragua Uruguay	Colombia Nicaragua Uruguay	Argentina	Dom. Rep. Honduras Guatemala	Belize Jamaica Guyana Venezuela	Argentina Peru	
1992	Ecuador Guyana Honduras Jamaica	Barbados	Nicaragua Peru	Argentina Jamaica	Barbados Mexico		
1993			El Salvador	Ecuador Bahamas	Nicaragua		Peru
1994	Brazil	Belize Haiti Suriname	Ecuador Guatemala Honduaras Jamaica Paraguay Venezuela	Barbados Belize Haiti	Chile Peru Trinidad and Tobago		Argentina Colombia
1995	Suriname	Panama	Belize Bolivia		Bolivia	Panama	
1996		Bahamas					Uruguay Mexico

Table C.2: Structural Reform Policies in Latin America (continued).