Did Globalization Lead to Segmentation? Identifying Cross-Country Growth Regimes in the Long-Run, 1870-2003

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Abstract

Economic historians stressed that income convergence was a key feature of the so-called OECD 'club' and that historical epochs of globalization was among the accelerating forces of those process in the last two centuries. This view, however, has been challenged, since it suffers from a sample selection bias as well as from an *ad hoc* assignment of the countries to the club. In the present paper, for the first time a mixture model is applied to a sample of 64 countries over the period 1870-2003, in order to endogenously identify the existence of cross-country growth regimes. Preliminary results show that growth patterns were segmented in two worldwide regimes, the first one being characterized by high growth rates and convergence of per capita income, and the other one denoted by slow growth and divergence. Interestingly, when three historical epochs are distinctly analyzed (1870-1913, 1913-1950, and 1950-2003), results show that the dynamics which come to dominate over the whole period emerged only during the second global wave. Therefore, history does not seem to provide unambiguous evidence about the positive relationship between globalization and growth.

Keywords: globalization, economic growth, income convergence, multiple regimes, mixture models.

JEL classification: C52, N10, O47.

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1 Introduction

Starting with Baumol's pioneering study (1986) there has been a general consensus that convergence in GDP per capita was the main feature among the industrialized economies since 1870. Economic historians have stressed that this process was fuelled by the two trade booms of 1870-1913 and the period post 1950, while the period 1913-1950 was characterized by increased protectionism, slow growth and divergence. It has therefore been argued that history provides an unambiguously positive relationship between globalization and convergence (Williamson, 1996). However, the previous evidence of long-run convergence relies on the choice of a small and *ad hoc* selected sample of industrialized countries, that now belong to the so-called 'OECD-club' and we know that actually converged ex post. This means that those nations which have not converged since 1870 have been excluded from the sample, due to their present relative poverty. This calls for a sample selection problem in long-term convergence studies, as already shown by De Long (1988). A way to solve this issue is to conduct the convergence analysis on a larger sample of nations, by identifying the growth regimes since 1870 without prior restrictions.

In addition, Epstein *et al.* (2003) have recently questioned whether the first global wave 1870-1914 really was a period of unconditional convergence fuelled by globalization, even within the OECD-club. Using distribution dynamics methods, they find that the long-run equilibrium of the pre-1914 period was characterized by forces of stratification rather than convergence and argue that convergence was primarily a feature after World War II. Similarly, O'Rourke and Williamson (1997) acknowledge that there were large varieties in growth experiences among the industrializing countries, over the period 1870-1914. For example, although Ireland, Italy and the Scandinavian countries went through a spectacular catch-up with the industrial core, Spain and Portugal lagged behind. O'Rourke and Williamson (1997) also show that globalization was by far the dominant force accounting for these differing economic outcomes and suggest a mixture of explanations to account for this, as the failure of capital flows to seek out cheap labor, heterogeneity in schooling, and factor market isolation.

In order to bring light into this long-term growth and convergence debate, mixture models appear to be useful analytical tools, since they allow us to endogenously select unknown clusters (i.e. convergence clubs) in a set of data. The aim of this paper is therefore to analyze long-term growth experiences using an unrestricted sample of 64 nations since 1870, to see whether we can identify different convergence clubs in the long run and whether the OECD-club really stand out during the first global wave. The model we test is in the framework of the so-called beta-convergence, for which we use data on the initial level, and on the growth rate, of per capita income.

We find that the period 1870-2003 is characterized by segmentation of cross-country growth patterns. Over the long run, the model identifies two regimes; the first one basically consisting of the OECD-club and being characterized by high growth rates and convergence of per capita income, and the other one denoted by slow growth and divergence and consisting of the rest of the sample. However, when the sample is split up into three historical epochs of global and anti-global waves we do not find evidence of an early converging OECD-club between 1870 and 1914, as previously suggested by Williamson (1996). Instead it appears that the dynamism of the converging OECD-club only emerged after World War II. These results highlight that analyzing long-term economic convergence using a sample of nations that have converged ex post, may bring misleading results about the growth patterns in the long-run. According to our findings, history only ambiguously supports the positive relationship between globalization and convergence.

The paper is structured as follow. Section 2 explains the econometric specification, Section 3 presents the data, Section 4 describes the results, and Section 5 contains the concluding remarks.

2 Identifying cross-country growth regimes

In order to identify the cross-country growth regimes we make use of a mixture of linear regression. The main feature of this model consists in the ability to uncover heterogeneous patterns of growth in the sample, without imposing *a priori* or *ad hoc* assumptions on the adherence of each country to a specific regime. Mixture models, in the form of mixture densities, have been employed to test the existence of poverty traps or convergence clubs (see, among others, Paap and Van Dijk, 1998), after the pioneering work by Quah (1996), which identified the so-called "twin peaks" in the income distribution worldwide. This kind of models has been then increasingly applied also to fit the distribution of regional incomes, as in Tsionas (2000), Pittau (2005), and Pittau and Zelli (2006).

As far as we know, mixtures of growth regression have been only adopted by Bloom *et al.* (2003), and by Battisti and Di Vaio (2008) in a regional context. The perspective adopted here differs from the work by Bloom *et al.* (2003), however, because we do not explicitly test the club convergence hypothesis. This latter phenomenon would imply that, for each country, the probability of falling in a regime should depend on some specific variables. On the contrary, we consider the probability to belong to a club as a parameter to be estimated in the model. Such a parameter does not depend on the initial level of income, nor is subject to any threshold in the factor accumulation, as in multiple equilibria models by Azariadis and Drazen (1990), and Galor (1996). So our model can be seen as a test of multiple regimes, independently on the initial conditions of countries, and it aims to provide a correct assessment of which are the countries falling in the specific regime. The question of why a country follows a particular growth pattern is therefore left open by the present work.

Let's start assuming that for each country i, the average growth rate of per capita income, $g_i = \left[\log(y_{i,T}) - (y_{i,t})\right]/T$, between time t and T, is given by

$$g_i = \alpha_j + \beta_j \log(y_{i,0}) + \varepsilon_{i,j}, \text{ with probability } \phi_j, \tag{1}$$

where $y_{i,0}$ denotes per capita income level at the beginning of the period, α_j is a constant representing the steady-state determinants of the economy, β_j is a convergence parameter approximating the speed at which the economy reaches the steady-state, $\varepsilon_{i,j} \sim N(0, \sigma_j^2)$ is a random shock affecting the growth rate of the economy, and $j = 1, ..., k$ is the regime to which the country belongs. Expression (1) is usually named *beta-convergence* equation, after the famous study by Barro and Sala-i-Martin (1992), and it can be seen as a test of increasing vs. decreasing returns to scale in the production function. If β_j is estimated with a negative (positive) sign, the evidence is supportive of decreasing (increasing) returns to scale, meaning that poor countries tend to converge (diverge) with the rich ones.[1]

Then assume g_i be distributed as a finite mixture of conditional univariate normal densities:

$$g_i \sim \sum_{j=1}^{k} \phi_j f_{i,j}(g_i \mid \log(y_{i,0}), \beta_j, \sigma_j^2), \tag{2}$$

where

$$f_{i,j}(g_i \mid \log(y_{i,0}), \beta_j, \sigma_j^2) = \frac{1}{\sqrt{2\pi\sigma_j^2}} \exp\left[\frac{-\left(g_i - \alpha_j - \beta_j \log(y_{i,0})\right)}{2\sigma_j^2}\right]. \tag{3}$$

The mixing proportions ϕ_j, i.e. the probabilities to belong to a regime, which sum to one, are *unknown* and should be estimated, along with the other parameters of the model. Higher the probability, more precise the identification of the regime is. This aspect makes clear that an *ad hoc* choice of the club may be conducive of misleading results, being equal to an arbitrary imposition of the probabilities. Particularly, we might erroneously asses that, for instance, a country obeys to a high-growth converging pattern, while, on the contrary, it follows a slow-growth diverging regime.

If the set of observations g_i is independently and identically distributed, the joint density or likelihood of the model, L, can be written as

$$L = \prod_{i=1}^{n} \left[\sum_{j=1}^{k} \phi_j \frac{1}{\sqrt{2\pi\sigma_j^2}} \exp\left[\frac{-\left(g_i - \alpha_j - \beta_j \log(y_{i,0})\right)}{2\sigma_j^2}\right]\right], \tag{4}$$

or, in its logarithmic form,

$$\log L = \sum_{i=1}^{n} \log\left[\sum_{j=1}^{k} \phi_j \frac{1}{\sqrt{2\pi\sigma_j^2}} \exp\left[\frac{-\left(g_i - \alpha_j - \beta_j \log(y_{i,0})\right)}{2\sigma_j^2}\right]\right]. \tag{5}$$

[1] As is well known, the estimated convergence parameter is usually biased if the steady-state determinants vary across the economies. In this framework, we treat this problem allowing for different intercepts across regimes. This is equivalent to assume that countries share the same steady-state values within regimes, but not between.

Estimation of the parameters of interest, α_j, β_j, σ_j^2, and ϕ_j, can be conducted maximizing equation (5), subject to the constraint $\sum_{j=1}^{k} \phi_j = 1$. The condition $\sigma_j^2 > 0$ is required to avoid the unboundedness of the likelihood function. Once estimates are obtained, i.e. $\widehat{\alpha}_j$, $\widehat{\beta}_j$, $\widehat{\sigma}_j^2$, and $\widehat{\phi}_j$, each country i is assigned to regime j looking at the posterior probabilities $\widehat{\psi}_{i,j}$, calculated by means of Bayes rule as

$$\widehat{\psi}_{i,j} = \frac{\widehat{\phi}_j f_{i,j}(g_i \mid \log(y_{i,0}), \widehat{\alpha}_j, \widehat{\beta}_j, \widehat{\sigma}_j^2)}{\sum_{j=1}^{k} \widehat{\phi}_j f_{i,j}(g_i \mid \log(y_{i,0}), \widehat{\alpha}_j, \widehat{\beta}_j, \widehat{\sigma}_j^2)}. \tag{6}$$

Basically,

$$\text{country } i \in \text{ regime } j \text{ if } \widehat{\psi}_{i,j} > \widehat{\psi}_{i,m} \ \forall m \neq j = 1, ...k. \tag{7}$$

The stationary equations of the maximum loglikelihood expressed in (5) are derived by DeSarbo and Cron (1988). Estimation can be straightforwardly dealt with the application of a two-stage Expectations-Maximization (EM) algorithm (see Dempster *et al.*, 1977). The EM algorithm works as follows: in the E-step, estimates of ϕ_j and $\psi_{i,j}$ are obtained maximizing the expected loglikelihood, while in the M-step α_j, β_j, σ_j^2 are estimated performing k weighted least squares regressions with weights given by the posterior probabilities. This latter step has been proved to be equivalent to maximum likelihood estimation (see DeSarbo and Cron, 1988, for technical details). After the starting values of the parameters are assigned,[2] the algorithm iterates until a specified convergence criterion is achieved.[3] While the procedure provides monotone increasing values of the objective function, convergence to a global optimum is not ensured, due to non-convexity of the loglikelihood function. To check the robustness of the results, several trials can be carried out.[4]

To make inference, as well as to calculate confidence intervals, requires the variance-covariance matrix of the parameters, which are asymptotically normal, being estimated by maximum likelihood. Louis (1982) shows how to derive the Fisher information matrix in EM environments. The inverse of this matrix provides the estimated covariance matrix (see Turner, 2000, for computational aspects).

An open issue relates to the choice of the k components, i.e. regimes, of the mixture. In principle, there is no need of a mixture whenever a one-component model, estimated by ordinary least squares, fits the data well. On the contrary, if a mixture model is preferred, the choice of two vs. three components, for instance, should be proved to be better. A decision strategy should be so adopted. However, no universal rule exists in the literature. We found our decision choice upon two main rules. First, following Turner (2000) we calculate a sequential likelihood ratio (LR) test of k versus $k+1$ components. The test is based on parametric bootstrap, since the likelihood ratio statistic is not regularly distributed.[5] Second, according to Hawkins *et al.* (2001), we

[2] In absence of specific priors, as in the present case, they are generated randomly.

[3] We set a threshold equal to 0.000001.

[4] We run 100 trials, choosing the estimates from the model with the highest loglikelihood value. The results, however, are very stable.

[5] The test is conducted launching 1000 replications.

look at the Bayesian information criterion (BIC),

$$BIC = -2 \log L + n_p \log n, \tag{8}$$

where n_p is the number of free parameters, which equals the dimension of the parameter vector minus one. The rationale of this criterion relies on assigning a penalty function to the less parsimonious model, because the loglikelihood can be an increasing function of the components number. The BIC is the recommended criterion for choosing between one and two components in the case of mixtures of linear regressions (see Hawkins *et al.*, 2001). Finally, the model is selected accordingly to the results of the two rules.

3 Description of the data

To estimate the model described in Section 2, we only need data on per capita GDP.

These are taken for 64 countries, over the period 1870-2003, from the database *Historical Statistics for the World Economy: 1-2003 AD*, developed by Angus Maddison, which is downloadable from the Internet page http://www.ggdc.net/maddison (last update: August 2007. For the list of countries see Table 4). Per capita GDP is expressed in 1990 International Geary-Khamis dollars. For detailed notes see Maddison (1995, 2001, 2003).

4 Discussion of the results

Over the full period 1870-2003, the model clearly identifies two distinct regimes, according to both the adopted selection criteria. The sequential LR test shown in Table 1 strongly rejects the null hypothesis of one versus two components of the mixture (the P-value is 1%), while it is not able to reject the null of two versus three components at any accepted significance level.[6] The values of the BIC reported in Table 2 also suggest the selection of two components. This means that a single one-component growth regression is not the best-fit model and produces misleading results, due to the assignment of the same growth pattern to all the countries in the sample.

The results from the estimated mixture model are shown in Table 3. Over the whole period 1870-2003, one regime has been significantly converging (with a beta coefficient of -0.007) and the other one significantly diverging (beta is 0.003). This result indicates that convergence of per capita income towards a common steady state is no general feature between the countries of the world over the long run. The majority of the countries fall in the diverging regime, but the model identifies a convergence club consisting of 19 countries. Those countries can be identified from Table 4 in which the posterior probabilities of a country belonging to each regime are shown. Regime 1 here refers to the convergence club whereas regime 2 stands for divergence. As seen from the table, many of the OECD countries show large probabilities of being assigned to regime

[6] The empirical distribution of the test is shown in Figure 1.

1. A few exceptions emerge: Germany, Greece, Portugal and Spain fall in the diverging regime due to relatively low average growth rates for the full period.[7] In addition, USA and New Zealand fall in the diverging regime, since they are both countries having high GDP in 1870 but growing richer over time.

Although we find evidence of a long-run OECD club we do not find any converging regime during the first global wave 1870-1913, as it can be seen from Table 3. In this case, however, the selection criteria provide a discordant information, since the LR test does not reject the null of one versus two components, while the BIC chooses the two-component model.[8] We prefer the parsimonious specification, given by the one-component model. Anyway, if we would be willing to accept the model with two components, results did not differ in qualitative terms, since two diverging regimes were estimated instead of one (see Table 3).[9] This clearly contradicts the Williamson (1996) notion of convergence between trading nations during the first global wave.

The scatter plots in Figure 2 show the estimated models' fit during the different epochs. The full period is displayed in the upper left panel where the converging regime stands out as a range of countries positioned along a straight line with a clear negative slope and a small confidence band. The diverging regime shows up in the slightly positive slope of the fitted line, but the confidence band is much larger. As opposed to the scatter plot from the full period, the plot in the upper right panel does not indicate any convergence club during the first global wave. The slope of the fitted line, produced by the one-component specification, rather shows divergence and no distinct growth pattern is found among the countries that had the highest logged GDP per capita in 1870.

From theory we would expect the countries to face modest growth rates due to decreasing marginal returns to capital. Instead these countries are positioned in two clusters on each side of the fitted line. Countries like Australia, Belgium, Ireland, Netherlands, New Zealand, Ireland, United Kingdom and Uruguay are all positioned below the fitted line and thus exhibit some tendency for slower growth than many countries in the sample. Simultaneously however there is a set of initially rich countries that are showing relatively high growth rates and diverging tendencies during the period. These countries cluster above the fitted line and are Austria, Canada, Germany, Denmark, France and Switzerland. It is interesting to note that both Germany and France show such high growth rates although large amounts of capital flowed from these regions to the poorer countries in the European periphery during the first global wave. Capital also flowed from Britain to countries in the new world such as Canada and United States which showed remarkably high growth rates, despite having initially high incomes in 1870. Immigration also meant that these new countries could avoid decreasing marginal returns to capital per worker. It thus appears as if the forces of

[7] Germany is particularly penalized by the slow growth of the inter-war years.

[8] The decrease in the loglikelihood, however, highlighted by the BIC is not so large, in absolute values, shifting from the one to the two component model (see Table 2).

[9] In additon, the convergence parameters of regime 1 and 2 are almost identical (0.002 and 0.004, respectively).

globalization and flowing capital did not create the expected convergence pattern, even in the industrializing world. Instead, the countries that were initially rich in 1870 show remarkably different growth patterns during the first global wave.

For the period 1913-1950 we identify only one regime, even though the selection criteria do not provide a clear indication. The LR test selects the two-component specification, while the BIC chooses the model with one component. Anyway, the rejection of the null of one versus two components, produced by the LR test, is not particularly strong, since the P-value is on the significance threshold of 5% (see Table 1). Also in this case, results do not substantially differ between the two specifications, since both of them support divergence - or at least persistence - of per capita income, as it can be seen from Table 3. This finding underlines the pre-existing historical notion that the inter-war period was characterized by a closing of markets that suppressed the alleged convergence forces from the first global wave. The scatter plot in the lower left panel in Figure 2 also shows that the period was characterized by diverging tendencies and modest growth rates. The only exception is Venezuela, an initially poor country showing growth rates of remarkably 5 percent annually due to the discovery of oil in the region.

The post-war period stands out as a period in which a group of 20 countries show strong and significant convergence, while the rest of the sample exhibits no clear patterns, e.g. persistence of per capita income. Looking a the selection criteria, the choice of the two-component mixture is clearly supported by the LR test, while the BIC seems to suggest a three-component specification. The identification of the convergence regime, however, is robust to the choice of the components number, since the estimation of a three-component mixture produces the division of the large persistent regime in two smaller ones.[10] Table 3 displays that the point estimate of the beta-coefficient of regime 1 (-0.016) is roughly twice as large as the estimate from the full period. From the posterior probabilities in Table 4 we note that all but three of the converging countries in regime 1 (Taiwan, Hong Kong and Singapore) belong to the OECD. On the other hand 44 countries in our sample are assigned to regime 2, which exhibits no significant pattern. This suggests that, excluding the Asian tigers, large parts of the poor world has not experienced the predicted convergence to the OECD. We do however also find a few OECD-countries, like Norway, United States (rich countries that were getting richer), Greece and Portugal (countries with disappointing growth rates given their initial GDP), in regime 2.

In addition, Table 4 indicates that the countries belonging to the long-run convergence club are as good as identical to those singled out for the post-war period.[11]. The long-run convergence pattern, that we estimated by means of the mixture of growth regression, thus appears to be completely determined by the dynamics of the post-war

[10] We do not show the results to save space.

[11] Norway was assigned to the converging regime for the full period, but its remarkable growth after the discovery of oil in the 1970s puts it in the diverging regime when the post-war period is analyzed separately. Spain, on the other hand, was assigned to the diverging regime for the full period, but due to rapid catch-up during the last decades it is assigned to the converging regime after 1950.

period.

5 Concluding remarks

Although forces of globalization have been well-documented for the period 1870-1913, this article shows that growth patterns have been diverse since 1870 and that it was not until after World War II that globalization seems to have been accompanied by convergence. The results highlight that using a restricted sample of nations that have converged ex post, may lead to misleading results about the growth patterns in the long-run. In fact, this latter were segmented in two worldwide regimes, the first one being characterized by high growth rates and convergence of per capita income, and the other one denoted by slow growth and divergence.

Interestingly, when three historical epochs of global (1870-1913, 1950-2003) and anti-global (1913-1950) waves are distinctly analyzed, results show that the dynamics which come to dominate over the whole period emerged only during the second globalization stage. Such results are in line with the ones obtained by Epstein *et al.* (2003), who reached similar conclusions for a sample of industrialized countries, even using a completely different methodology. According to our findings, history only ambiguously supports the positive relationship between globalization and convergence.

Future research should investigate why globalization has brought about convergence in some countries but not in others and why these forces appear to be limited to the last decades only. Especially the role of trade needs to be investigated.

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Tables and figures

Table 1. Sequential LR test of k versus $k+1$ components*

Period	1 vs 2	2 vs 3
1870-2003	26.6 (.01)	3.97 (.81)
1870-1913	3.85 (.76)	-
1913-1950	17.2 (.05)	5.99 (.71)
1950-2003	26.3 (.00)	23.3 (.17)

* P-values between parentheses. Maximum number of components: $k = 3$.

Table 2. Bayesian information criterion (BIC)

	1 Comp.	2 Comp.	3 Comp.	Selected
Period 1870-2003	-491.4	-497.2	-484.5	2 Comp.
Period 1870-1913	-510.2	-512.5	-510.9	2 Comp.
Period 1913-1950	-407.2	-403.6	-400.0	1 Comp.
Period 1950-2003	-378.8	-385.1	-391.8	3 Comp.

Table 3. Cross-country growth regimes: estimation results

	1 Component (OLS)	2 Components (ML)	
		Regime 1	Regime 2
	Period 1870-2003		
Constant	.005	.070***	-.003
Log of p.c. GDP 1870	.002	-.007***	.003**
Weight (%)	-	23	77
R-squared	.03	-	-
Log-likelihood	249.9	263.1	-
	Period 1870-1913		
Constant	-.010	-.004***	-.013
Log of p.c. GDP 1870	.003***	.002***	.004***
Weight (%)	-	18	82
R-squared	.15	-	-
Log-likelihood	259.2	270.8	-
	Period 1913-1950		
Constant	-.015	-.038***	-.008
Log of p.c. GDP 1870	.003*	.006***	.002
Weight (%)	-	19	81
R-squared	.05	-	-
Log-likelihood	207.7	216.4	-
	Period 1950-2003		
Constant	.045***	.168***	.044***
Log of p.c. GDP 1870	-.003	-.016***	-.003
Weight (%)	-	25	75
R-squared	.03	-	-
Log-likelihood	193.6	207.1	-

***, **, * denote statistical significance at 1%, 5%, and 10%, respectively. In grey: mixture results. Dependent variable: average growth rate of per capita GDP (various periods). Observations: 64.

Table 4. Posterior probabilities*

	Period 1870-2003		Period 1950-2003	
	Regime1	Regime 2	Regime 1	Regime 2
Austria	0.60	0.40	0.84	0.16
Belgium	0.56	0.44	0.70	0.30
Denmark	0.56	0.44	0.69	0.31
Finland	0.86	0.14	0.77	0.23
France	0.60	0.40	0.74	0.26
Germany	0.46	0.54	0.68	0.32
Italy	0.58	0.42	0.75	0.25
Netherlands	0.57	0.43	0.68	0.32
Norway	0.56	0.44	0.49	0.51
Sweden	0.66	0.34	0.64	0.36
Switzerland	0.57	0.43	0.60	0.40
United Kingdom	0.61	0.39	0.61	0.39
Ireland	0.51	0.49	0.69	0.31
Greece	0.03	0.97	0.01	0.99
Portugal	0.02	0.98	0.01	0.99
Spain	0.42	0.58	0.77	0.23
Australia	0.62	0.38	0.68	0.32
New Zealand	0.21	0.79	0.02	0.98
Canada	0.62	0.38	0.68	0.32
United States	0.10	0.90	0.20	0.80
Albania	0.00	1.00	0.00	1.00
Bulgaria	0.00	1.00	0.00	1.00
Czechoslovakia	0.00	1.00	0.00	1.00
Hungary	0.00	1.00	0.00	1.00
Poland	0.00	1.00	0.00	1.00
Romania	0.00	1.00	0.00	1.00
Russia (USSR)	0.00	1.00	0.00	1.00
Yugoslavia	0.00	1.00	0.00	1.00
Argentina	0.00	1.00	0.00	1.00
Brazil	0.00	1.00	0.00	1.00
Chile	0.00	1.00	0.00	1.00
Mexico	0.00	1.00	0.00	1.00
Uruguay	0.00	1.00	0.00	1.00
Venezuela	0.00	1.00	0.00	1.00
Jamaica	0.00	1.00	0.00	1.00
China	0.00	1.00	0.00	1.00
India	0.00	1.00	0.00	1.00
Indonesia	0.00	1.00	0.00	1.00

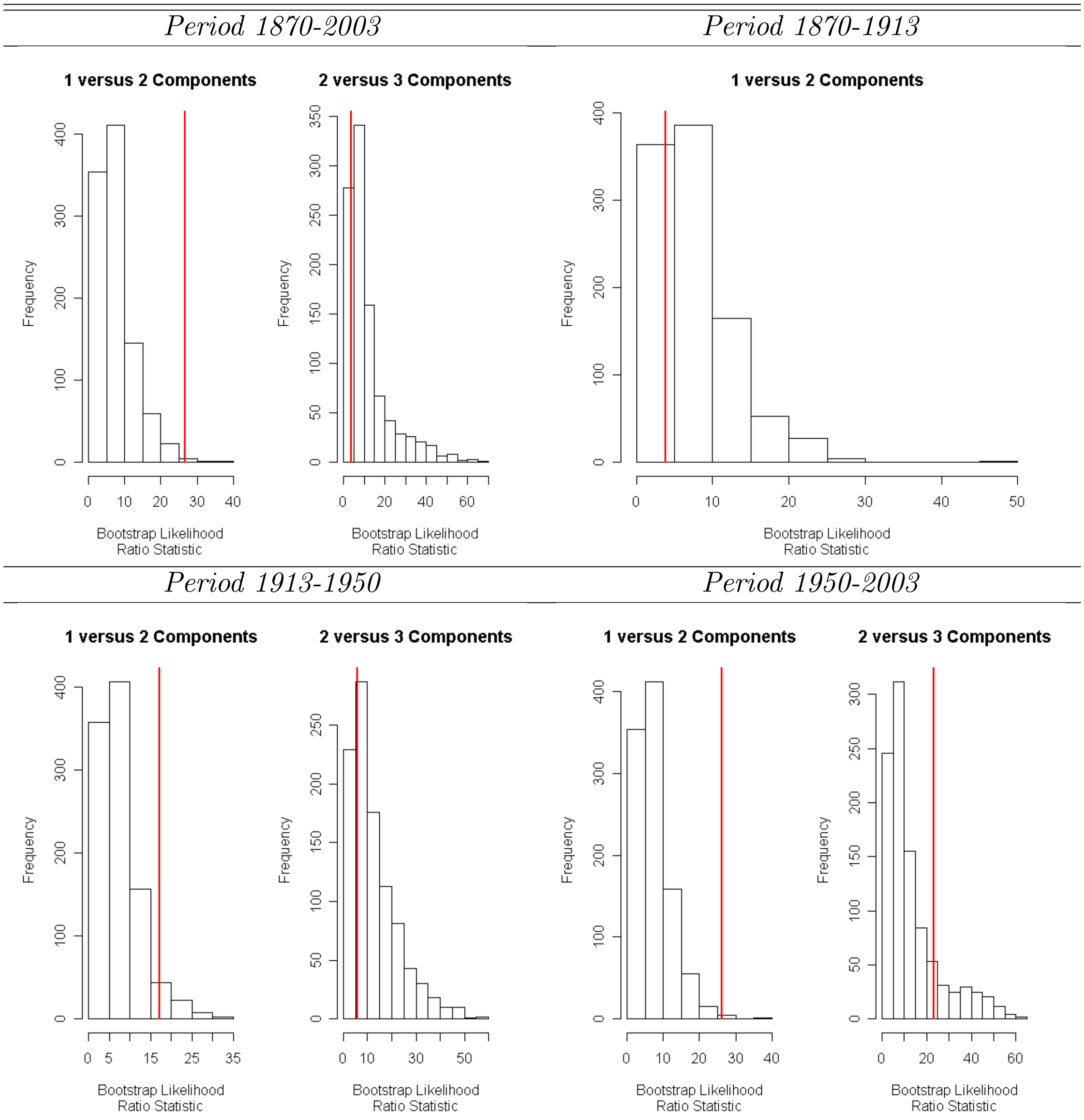
* In grey: regime 1.

Table 4. Continued*

Japan	0.99	0.01	0.96	0.04
Philippines	0.00	1.00	0.00	1.00
South Korea	0.95	0.05	0.99	0.01
Thailand	0.00	1.00	0.00	1.00
Taiwan	1.00	0.00	1.00	0.00
Burma	0.00	1.00	0.00	1.00
Hong Kong	0.99	0.01	0.83	0.17
Malaysia	0.00	1.00	0.00	1.00
Nepal	0.00	1.00	0.00	1.00
Singapore	0.99	0.01	0.95	0.05
Sri Lanka	0.00	1.00	0.00	1.00
North Korea	0.00	1.00	0.00	1.00
Vietnam	0.00	1.00	0.00	1.00
Iran	0.00	1.00	0.00	1.00
Iraq	0.00	1.00	0.00	1.00
Jordan	0.00	1.00	0.00	1.00
Lebanon	0.00	1.00	0.00	1.00
Syria	0.00	1.00	0.00	1.00
Turkey	0.00	1.00	0.00	1.00
West Bank and Gaza	0.00	1.00	0.00	1.00
Algeria	0.00	1.00	0.00	1.00
Egypt	0.00	1.00	0.00	1.00
Ghana	0.00	1.00	0.00	1.00
Morocco	0.00	1.00	0.00	1.00
South Africa	0.00	1.00	0.00	1.00
Tunisia	0.00	1.00	0.00	1.00

* In grey: regime 1.

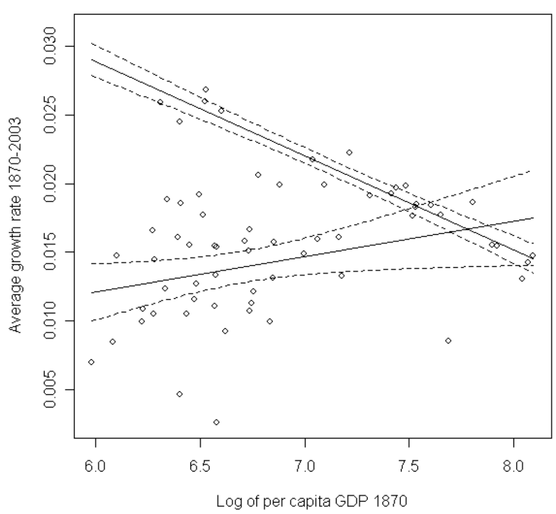
Figure 1. Empirical distribution of the LR test*



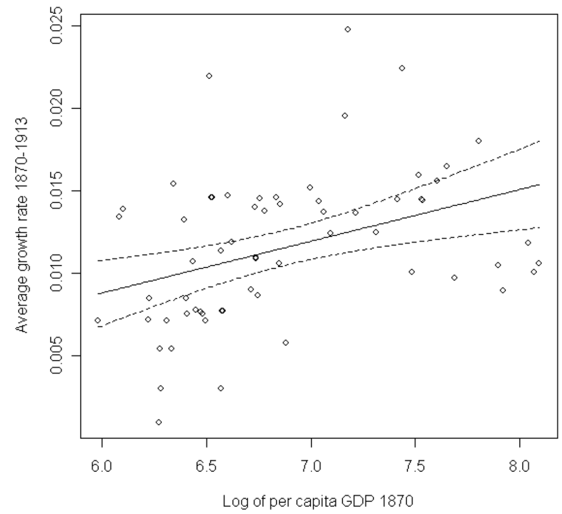
*1000 bootstrap replications.

Figure 2. Cross-country growth regimes: model's fit*

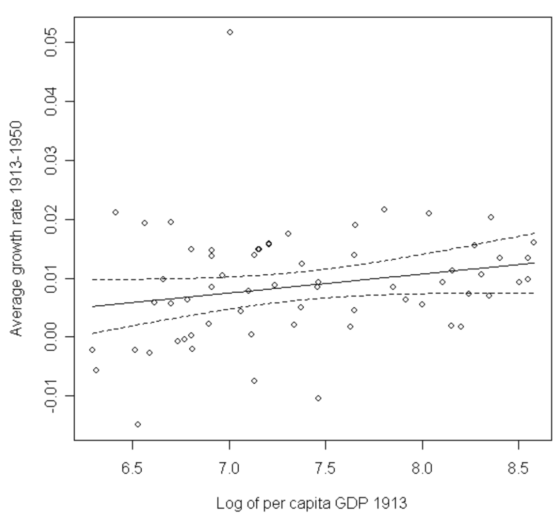
Period 1870-2003



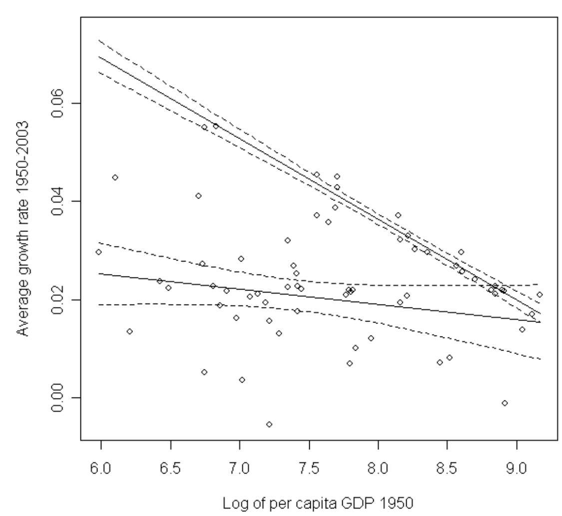
Period 1870-1913



Period 1913-1950



Period 1950-2003



*Solid line: regression fit; dotted line: confidence band at 95% level.