

Is there Convergence among the North America Free Trade Agreement Partners?

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Introduction

Mexico has already gone through two decades of macroeconomic reforms. The liberalisation of the economy and its opening were essential components of the reforms. They were accompanied by the equally important political and institutional reforms. All of these were undertaken with the same goal in mind: speeding up sustained growth, reducing internal gaps and strengthening political democracy. The NAFTA agreement included the specific goal of reducing migration toward the United States, an objective that could be achieved if the convergence between these two economies were under way. The convergence process was to be invigorated by both foreign trade liberalization and structural reforms. This work analyses the convergence between Mexico and the United States within the NAFTA framework.

This work is part of a more extensive one, an analytical effort exploring the impact of trade reforms on the absorption of domestic factors, productivity and growth. An increment in exports presupposed a more intensive use of the abundant labour factor, in other words, unqualified labour force. The underlying hypothesis was that as export rates expanded, the demand for this resource would increase and wages would also rise. Moreover, if workers augmented their productivity as a result of being transferred to activities with higher comparative advantages and educational improvement, workers' remuneration would increase as well. However, remuneration to capital would not grow to the same extent. The gap dividing Mexico and the United States would be reduced and migration would lose its charms. However, in the Mexican scenario, these have not come about.

The paper is organised into the following sections: In the first section, convergence issues are discussed. The second section provides definitions of convergence and discusses quantification methods. The third section deals with the evolution of the NAFTA region taking into account the pre-opening and pre-NAFTA experiences. Convergence marked the period between 1945 and 1982, while there was gap amplification during the 1983-2001 period; the fourth section, therefore, presents a growth model for the three economies of NAFTA, to explain the causes for divergence. In the fifth section, the sources of Mexican economic growth are explored. The sixth section forms the conclusion.

I. Convergence as the Goal of Economic Growth

A country reforms its development model or participates in multilateral or bilateral trade negotiations and integration agreements to overcome the obstacles to its economic growth

and advance toward the more developed ones. To speed up growth and shorten distances between member countries, preferential treatment needs to be granted to the less developed economies (GATT and WTO). Therefore, in multilateral negotiations, as well as in regional integration, preferential treatment has been conceived to create mechanisms of convergence and to stabilize the agreements.

Concerns about the different dynamics attached to per capita incomes between countries have been a constant discussion-matter of growth theories; in fact, they have been synthesised into multiple growth models. Smith, Malthus and Ricardo have looked into the causes that allow population to increase welfare, and ever since, these have constituted an essential part of economic thinking. Recently, analyses on the correlation between the changes in trade policies, the regional integration programmes, and convergence rates have been studied in depth. It has been assumed, without much theoretical or empirical foundation, that economic liberalisation and more intense trade integration among countries, will raise trade volume, affect rates of growth, and reduce income unevenness. There is supposedly a direct link between trade liberalisation and convergence rates. This conclusion can be discussed with the observation made by Berg and Krueger (2003) that convergence can occur in “sufficiently similar regions, of the same country, and less clearly, among nations integrated through commerce”. Nonetheless, these authors conclude that poor countries and regions may grow faster than the rich if their economies are sufficiently open and integrated. For OECD countries, several authors conclude that convergence has actually happened since World War II. When it comes to the European Union, convergence was clearly revealed when the Treaty of Rome took place in 1958 (Ben-David, 1993; Olivera et al., 2003). Other authors suggest that convergence goes back to the end of the 19th century, and also covers countries which are neither part of the EU nor of the European Free Trade Association EFTA (Quah, 1995; Slaughter, 1998; Rodríguez and Rodrik, 1998). Trade has not been the main catalyst for the convergence among EU countries. The process slowed down soon after the Treaty came into effect, and trade could, in fact, enhance more divergence (Slaughter, 1998).

According to Rodríguez and Rodrik (1998), the direct link between the opening of an economy, foreign trade, and the cut down in the dispersion of countries trading with each other (subject-matter of many theses), is based on the postulates that countries that are open to external exchange speed up their growth. Since it has been taken for granted that poorer countries have preserved severe restrictions to external exchange, it is possible to conclude that their opening has to induce higher growth compared to those that have previously undergone an opening-like process. In that sense, increasing trade exchanges and opening economies to international competition has an important influence over convergence rates, affecting them with the same devices that accelerate economic growth: the increase in investment efficiency, growth with constant return-rates due to major market access, higher domestic savings and external flow of capital rates, and strict domestic discipline when handling macroeconomic policies (Berg and Krueger, 2003).

Measuring convergence has neither been a serious methodological problem, nor has it entered into debate. This controversy emerges from the very sources of convergence and from the possibility of isolating the effects of each variable in the per capita GDP dispersion and the swiftness of its growth. Slaughter (1997) provides an approach different

from that presented by Barro and Sala-i-Martin (1992) and all the research work based on the Solow Model. According to Solow and his supporters, the convergence of growth of *per capita* GDP is a result of the differences in capital accumulation rates financed by domestic savings. Therefore, the effects produced by the accumulation of capital in international trade and rates of growth are put aside.

Barro and Sala-i-Martin (1995) studied the convergence process designed for American Union States, regions of Europe, prefectures in Japan and the OECD countries from 1952 up to 1960. Their results suggest the existence of an absolute convergence, with the rise in the per capita GDP rates of growth of poor countries and regions being higher than those of the rich. This happens only when the economies are sufficiently integrated into each other.

Sachs and Warner (1995) graphed the GDP/worker rhythm of growth and the per capita GDP logarithm of 1965 for two countries, classified in accordance with the opening degree defined by them. They found evidence showing that increments in convergence rates and products increase due to commercial opening impacts. These pieces of work, as well as the analysis of both authors, are intended to demonstrate that trade opening increases convergence and speeds up product growth in the countries involved. Quah (1995) raises doubts about the 2% uniformity in convergence rates that can be proved through several analyses. Likewise, he reveals that this quasi-absolute 2% convergence law was brought about by the estimation method, having very little to do with economic growth dynamics and getting closer to the unitary root in time series. Using a theoretical model based on dynamic balances, he points out all problems attached to cross-section convergence estimations and panel-type analyses. Moreover, he finds polarisation emerging from the convergence of rich and poor countries, and the disappearance of the middle-income group of countries. These explain why he has doubts about the existence and interpretation of the β -convergence.

Similarly, Arora and Vamvakidis (2001) explore the impact of the American GDP growth on other economies. Convergence is used as an independent variable in the growth model. The per capita GDP logarithm shown in the first year is a part of other series of explanatory variables of economic growth (e.g., population growth, investments in fixed capital, high school registration, inflation, government consumption, international trade share of GDP, rates of growth in the United States and rates of growth in the rest of the world). The transmission mechanisms of the multiplying effects of growth in the American economy are synthesised in trade, in export-import effects, financial flows, technological spillovers, and the impact on sectors not directly related to trade.

Olivera's (2002) work applies the classical Solow growth model, and does not presume any opening or international trade impact on economic growth. He analyses economic convergence taking into account internal factors, and ponders these results with the help of trade effects and opening process. Among the inner determinants of growth, we can highlight the investments in physical capital, population rates of growth, human capital stock, the existence of a technological mechanism of convergence, labour markets evolution and the stability of nominal inflation, public budget deficit, interest rates etc.

Berg and Krueger (2003) have looked into a series of articles¹, to demonstrate that trade opening constitutes an economic source of growth and has very positive side effects because it diminishes poverty. Without going too deep into the matter, they mention a debate on the measuring problems attached to commercial opening levels and the causality between trade opening and economic growth. Throughout their work, they tend to overestimate the effects produced by trade. Trade policies are just a part of a more extensive package of measures related to macroeconomic stability, direct foreign investment, internal markets liberalisation, solid institutional market, corruption, bureaucratic quality, expropriation risks etc. Nevertheless, to Berg and Krueger, poor regions and countries tend to grow faster than the rich if the first group of countries is well integrated into the second. This statement contradicts Slaughter's results (2001), who did not find any forceful evidence demonstrating that trade liberalisation has positive effects on the speed of convergence among countries. Berg and Krueger also conclude that poor countries may grow and reduce poverty levels if they are open enough to foreign commerce. However, this conclusion is rather forced; none of these studies reveals the effects of opening and trade expansion over poverty, nor do they prove the existence of free trade mechanisms reducing the number of poor people.

Another analytical review of several articles discussing the correlation between trade, reforms, opening and growth was made by Rodríguez and Rodrik (1999). These authors question methodological problems and the consistency of the statistical results used to show that trade opening is closely related to economic growth. They advise economists to be extremely cautious when it comes to presuming a direct connection between trade, growth and welfare.

In their original specifications, and applied to different or modified cases—designed to unmistakably assert the strength of their results—Rodríguez and Rodrik prove Dollar's (1992), Sachs and Warner's (1995), Ben-David's (1993) and Edwards' (1998) models. This way, Rodríguez and Rodrik questioned the connection linking trade and growth—the bond that these authors have been testing in some of their articles. In other words, they doubt the restrictive measures to trade, the effective exchange rate distortion index and the real exchange rate variability index applied by Dollar. Due to its restrictive assumption and its high degree of sensitivity to any alteration in the model or index, the effective exchange rate variability index is of very little use. They lay special focus on Sachs and Warner's work, and the five indicators which have helped them assemble their renowned openness index. According to Rodríguez and Rodrik (1999), the fact that the two indicators, namely, the state exporting monopoly indicator and the black-market premium that are responsible for the strength of the index, are not direct measures of trade policy, settle the reliability of the openness index. At the same time, the first indicator generates bias on estimations. The second, on the other hand, is not really a good trade policy measure, since it is also a proxy of other variables not related to trade policies. With regard to the positive correlation between opening, productivity growth and GDP stated by Edwards (1998), Rodríguez & Rodrik (1999) demonstrated that this does not constitute a statistically absolute result, at least not in the case of a cross-section of countries.

Baldwin (1997?), in his review on this literature, gives significant weightage to the critique by Rodríguez & Rodrik (1999). Nonetheless, in general he concludes that the opening of an

economy is more favourable to economic growth than inward-oriented economies or autarchies. He inverts the correlation of causation, and underlines that the increment in exports is more likely to be a consequence of economic growth rather than its cause.

II. What does Convergence Mean?

There are several definitions and measurements of convergence. All of them are aimed at the reduction in the differences of welfare levels or rates of growth between countries or regions within a State. In every case, convergence has to do with growth sources and the conditions and policies that trigger them.

Absolute convergence or type- β convergence (Barro, 1991; Sala-i-Martin, 2000) indicates the process by which the economies having lower income levels register rates of growth superior to those having higher per capita incomes. This implies that there is a negative correspondence between rates of growth of income between the starting year and the following years.

The sigma (δ) convergence, a concept that must not be confused with the previous one, indicates that per capita rent dispersion between groups of economies tends to be reduced in time, and is expressed as the reduction of the differences in GDP/C levels between countries or groups of countries (convergence clubs). This calculation is based on the standard deviation of natural logarithms of the per capita incomes of countries or regions. The existence of a reduction in the deviation—that is, the deviation trend sign is negative—suggests the presence of convergence, the opposite of divergence. According to this concept, countries having a lower GDP/C will register rates of growth superior to those experienced by more developed countries. This study is usually prepared for a period of time which is long enough to allow the detection of movements toward convergence or divergence, and to determine whether these changes in trend are related to any particular incident. A good example can be found in trade liberalisation or the instrumentation of an integration agreement (Arora and Vamvakidis, 2001; Sala-i-Martin, 2000; Quah, 1995; Quah, 1995).

Another basic concept is conditioned convergence; this concept incorporates the structural conditions of the stationary state of each economy. These structural conditions are essential for the poor economies to speed up their growth more rapidly than rich countries. To figure it out, it is necessary to define equations of growth, with different variables, according to each school.

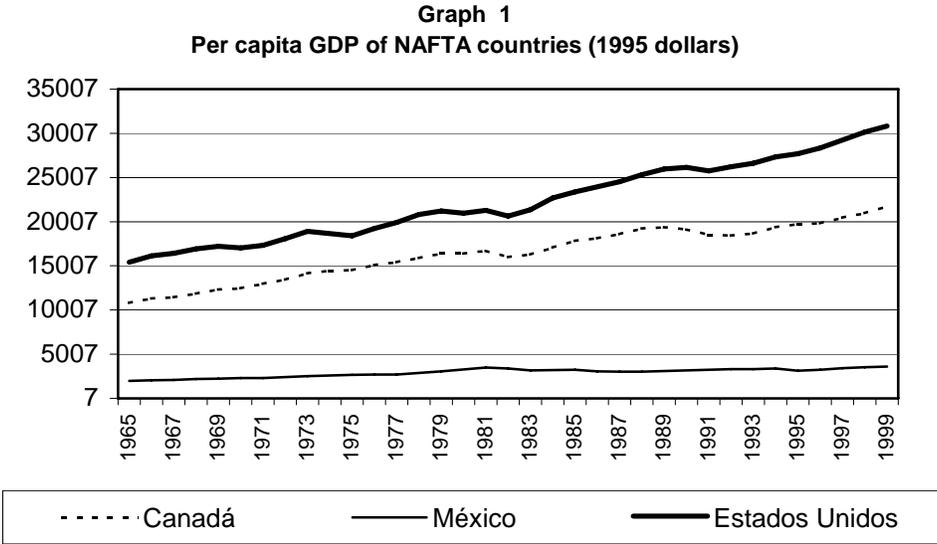
III. Are the NAFTA Gaps getting Narrower?

In this section, we will examine whether the NAFTA member countries have reached convergence with the coming into effect of the agreement. We will also calculate absolute and sigma convergence, and study in depth the variables affecting the rates of growth of the three economies which are part of the agreement. The path of growth of the per capita product in the three countries will be analysed as well. The analysis will cover a sufficiently long period of time, so as to detect the historical trend and determine when and why there were changes in this path.

Even though it involves only a small number of countries, this analysis is important because of several reasons. The three economies were closely related to each other long before NAFTA came into effect. In addition to intensive commercial exchange, investments and technological transfers—not to mention that migration has consolidated purely commercial relations even more—the links connecting these economies are of great significance, as suggested in the studies by Krueger (2003); therefore, convergence should appear as evident. Apart from that, this analysis allows us to test the suppositions that state that trade flows going from small countries (or less developed) to the rich are catalysts of convergence, as acknowledged by Arora and Vamvakidis (2001) and Krueger (2003). Given the importance of the Mexican human capital investment, that has considerably elevated university labour supply (Romero and Puyana, 2003), it is possible to prove whether this factor promotes convergence in accordance with Ben-David and Kimhi's (2000) results. It is also possible to verify whether there is a positive correlation between opening and changes in trade policies of foreign investments and convergence.

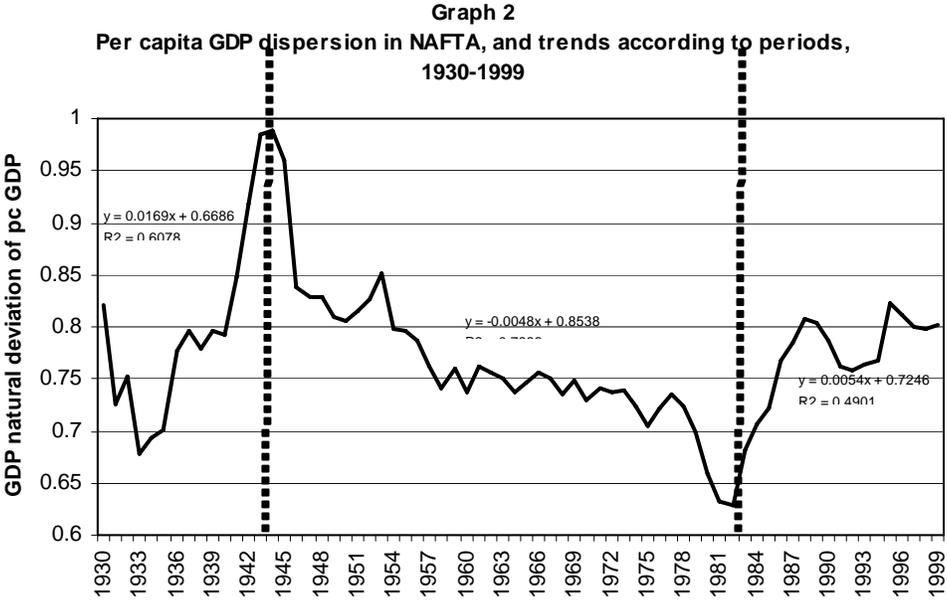
To analyse the path of the member countries' GDP/C, first we would have to measure the sigma convergence for the 1930-2000 period, using Madisson's (1998) data of the 1930-1986 period as a base, as well as our calculations to complete the series up to the year 2000, all of them based on the World Bank's World Development Indicators (2002). After having found positive values to sigma convergence, that is, detecting divergence in a 56-years time period, we will delineate an equation of growth for the economies of the three countries, to identify the factors explaining the lack or the presence of beta convergence.

Graph 1 indicates the GDP/C trajectory for the three NAFTA member countries. At first sight, it is clear that the income gap registered in 1965 has widened. It is possible to know how much this gap has widened and when this amplification started, by calculating sigma convergence.



Source: Puyana and Romero's calculations based on World Bank's *World Development Indicators*, 2002, CDR.

As previously discussed, sigma convergence suggests the rhythm of the speed of approaching or distancing of per capita incomes. Graph 2 presents sigma convergence for the 1930-2000 time period, that is, the trajectory of the standard deviation value of the GDP/C natural logarithms of the three countries. It can be divided into three stages. The first stage is 1930-44, when the prevalent trend was the augmentation of dispersion. During these years, the entire world was undergoing deep perturbations related to the 1929 crisis and the Second World War. The second stage is 1945-1982, and it includes the reconstruction efforts of the Japanese and European economies, and the world economy's reconversion from war to civil. During this period, the world economy grew like never before. This period is also known as the "golden age of Capitalism" (Scott, 1991). These have been the only years when the standard deviation value has actually been negative, that is, the three economies expanded at a very rapid rate. As a consequence, by 1982, they reached a point where the distance separating them was the smallest ever registered. The third stage is 1982-2000; it started with the debt-crisis outbreak and the reforms, and it ended with the 20th century, when these changes had been established, the opening process had settled down, and seven years after the NAFTA and the privatisation process had been set in motion. During these years, the standard deviation augmented, and the three economies grew distant from each other. Neither the export push nor the NAFTA effects could reverse the direction of this new trend.



Source: Puyana and Romero's calculations based on Madisson (1999) and World Bank (2002).

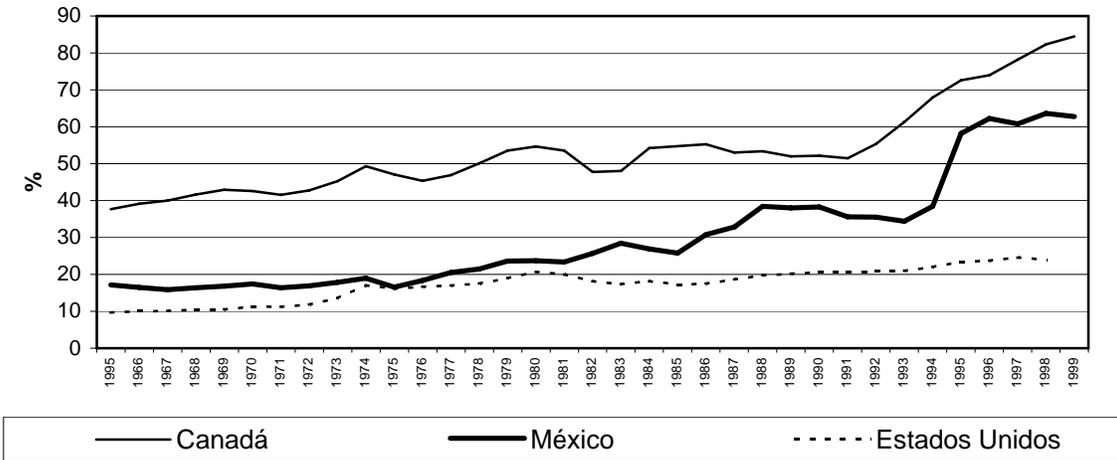
Based on this exercise and given the sigma convergence values, it is possible to assert that convergence was shown exclusively during the rapid growth period of these economies. This process took place throughout a stage marked by the second post-war reconstruction, when the world order was kept relatively closed (Promfett, 1999), and most of the developing countries, including those of Latin America, were applying import substitution with varying emphasis (Krugman, 2002). Also, there was convergence in Southeast Asian countries and developed countries, when the first still kept the most essential elements of

their intervened economy model (Rodrik, 2003). For NAFTA members, convergence slowed down and started reverting in 1982, the year when the three countries, especially Mexico, liberated their economies. This turnabout did not reduce the gap amplification, and results looked as if they could coincide with Quah’s (1995) conclusions in the case of the European Union—that growth and convergence precede the opening, and growth cannot accelerate convergence.

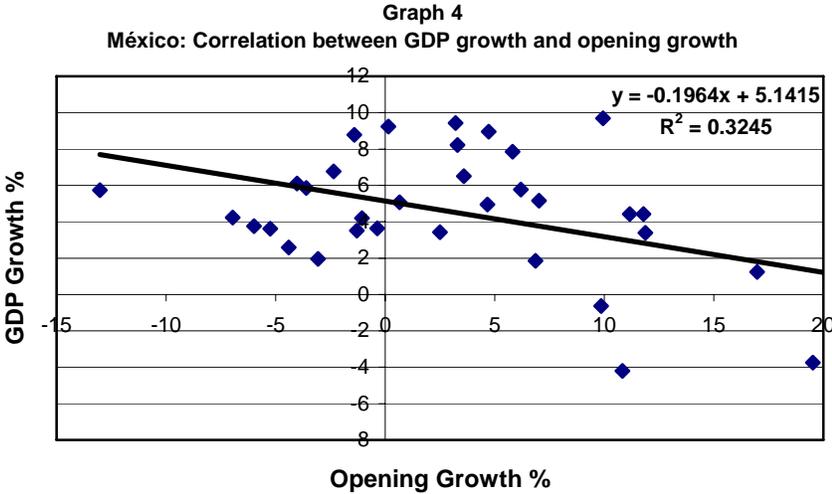
To go deeper into the analysis of NAFTA convergence, and to account for the importance given to the opening in designing policies and the argument sustaining the unmistakable existence of a positive correspondence between trade and sustained growth, we will explore the opening rate for these economies and their correlation with GDP growth. Our results reinforce the previous conclusions about the gap amplification between NAFTA member countries, especially between Mexico and the United States, from 1982 to 2000. These conclusions also augment Rodríguez and Rodrik’s discussion of NAFTA countries; particularly in the case of Mexico, a very small or a non-existent correlation between the opening rate and the GDP growth was found. To come to this conclusion, we took as an opening measure the external rate of GDPⁱⁱ. This indicator points out the opening degree of an economy, and ultimately that of productivity. It must be assumed that a successful procedure of trade liberalisation, “to put prices right”, should generate the sustained growth of the export-import rate with regard to GDP. If the export sector showed productivity higher than that of the rest of the economy, it would be logical for those countries to relocate the productive factors toward exports, revealing raises in the external rate of GDP, and higher rates of productivity and economic growth.

We will start out by mentioning that the American economy is less open than the Canadian and the Mexican economies (Graph 3). This, however, does not imply that the American economy is being more protected by tariff or non-tariff barriers. It only suggests that the American domestic market is wider, that Americans export a lesser amount of products, and that the external content of their economy is smaller due to a larger productivity, among other factors.

Graph 3
Trends in the opening coefficient of NAFTA countries



It is possible to detect a negative correlation between the high rhythm of growth of the GDP's external rate shown by Mexico, and the expansion rate of its economy. Graph 4 presents the two-variable value of simple correlation results from 1960 to 2000. The trend sign is negative, and in the Mexican case, it suggests that the bigger the opening degree, the smaller the growth. There is no causation rapport between the variables; so, it is necessary to go deeper into the elements explaining the Mexican economic growth. The interesting thing, and therefore worrying, is that we did obtain a positive and significant correlation between the two variables in the Canadian case, and we actually observed a positive correlation (to a lesser extent) in the American case (Graph 1 and 2 of Appendix). Consequently, it is essential to explore the Mexican economy's sources of growth and identify the causes explaining why this opening has not included higher rates of growth and convergence, as was expected. Our results are in line with those of Slaughter (1997) and Quah (1995).



IV. NAFTA Sources of Divergence

Once it has been recognized that there was no convergence among NAFTA countries during the 1982-2000 period, we will establish the convergence sources in NAFTA countries. The first step is to calculate beta convergence for the 1960-2000 period. To do so, we do not exclusively depend on the per capita income of the three nations shown in the previous exercise, but include data on the variables of growth. Beta convergence tells us whether the less developed country in the starting year grows more rapidly in the following years. Beta convergence is calculated according to the following expression:

$$GY_{Ti} = C_0 - \beta LNY_{t-1} + U_t,$$

Where $GY_{Ti} = LNY_t - LNY_{t-1}$ is the difference of the natural logarithm of the per capita income of the i country in the t and $t-1$ periods of time, C_0 is the constant, and the β parameter estimates absolute convergence. LNY_{t-1} is the logarithm of the per capita product in the initial year for each i country, and the std error is represented by U_t . The result is as follows:

Beta Coefficient = -0.001390132. The beta coefficient sign is negative. As a result, there is divergence.

The results suggest that the initial GDP/C level does not determine convergence among NAFTA countries. Thus, it is essential to explore the variables explaining the trajectory of product growth in this region. That is why we estimated the per capita GDP growth for Canada, Mexico and the United States by defining an equation that integrates variables generally accepted by the specialistsⁱⁱⁱ.

Variables in the equation represent the values registered to each one of the three countries.

$$\text{CRECY} = C(1) + C(2) * \text{YPCT} + C(3) * \text{INV} + C(4) * \text{GOB} + C(5) * \text{COM} + C(6) * \text{POB} + C(7) * \text{INF} + \varepsilon$$

Where:

CRECY	Rate of growth of the per capita GDP of each country.
YPCT	Logarithm of the per capita income in 1960 for the three countries.
INV	Gross formation of tax expenditure in product for the three countries.
GOB	Tax expenditure share in product in the three countries. All expenses but investments included. This is considered to be positive.
COM	Opening degree for the three countries.
POB	Population rates of growth for the three countries.
INF	Inflation rate for the three countries.
ε	Std. Error.

The results were the following:

Dependent Variable: **CRECY**

	Coefficient	Std. Error	T-Statistic	Prob.
C(1)	-5.210200	7.561826	-0.689014	0.4922
C(2)	0.458987	0.812938	0.564603	0.5734
C(3)	0.591213	0.121737	4.856494	0.0000
C(4)	-0.389847	0.121795	-3.200844	0.0018
C(5)	0.007223	0.020115	0.359077	0.7202
C(6)	-0.953812	0.679500	-1.403697	0.1631
C(7)	-0.068860	0.013614	-5.058015	0.0000

R-squared 0.302075

Convergence coefficient C(2), the per capita initial GDP, even though positive, is not statistically significant. This is consistent with the results obtained in absolute convergence.

The inversion C(3) is a significant element of the countries' growth; this is caused by countries augmenting their participation at 1 percentage point in the product, and is likely to lead to a 0.6 raise in the per capita income. Meanwhile, government consumption C(4) negatively affects the rate of growth^{iv}. Commercial opening C(5) maintains a positive though not significant correlation^v. This non-significant effect is partly due to permanent deficits in balance of trade and the limited added value of exports—that is, the restricted usage of domestic factors, which triggers the coefficient and not the added value. In this

sense, population growth C(6) keeps an inverse correlation with product growth; however, it is not significant. Finally, the change in price levels C(7) is inversely related to the product rate of growth.

V. Some Factors of Growth in Mexico

To determine the variables of growth of the Mexican economy, we selected the most common ones: demographic growth, physical capital investment, macroeconomic policies, trade opening, and the effect produced by Mexico's most important trade partner.

The equation to calculate the Mexican GDP for the period under study is as follows:

$$YG = C(1) + C(3)*YGUS + C(4)*GOB + C(5)*INF + C(6)*INV + C(7)*COM + C(8)*POB + \varepsilon$$

Where,

YG	is the per capita income rate of growth in Mexico,
YGUS	is defined as economic growth in the United States,
GOB	represents Mexican government consumption in GDP,
INV	is the percentage that gross fixed capital formation represents in Mexican GDP,
COM	is the correlation of exports plus imports divided into the product,
POB	is the rate of population growth, and
ε	Std. Error.

Results

The interrelation degree C(3) between the rhythm of growth of the United States and Mexico is positive and significant. Nonetheless, the positive effects of North American growth are attenuated by an inverse correlation, not significant though, between the opening degree C(7) and the variation of Mexican GDP, given that the export level has been constantly bigger than the Mexican exports.

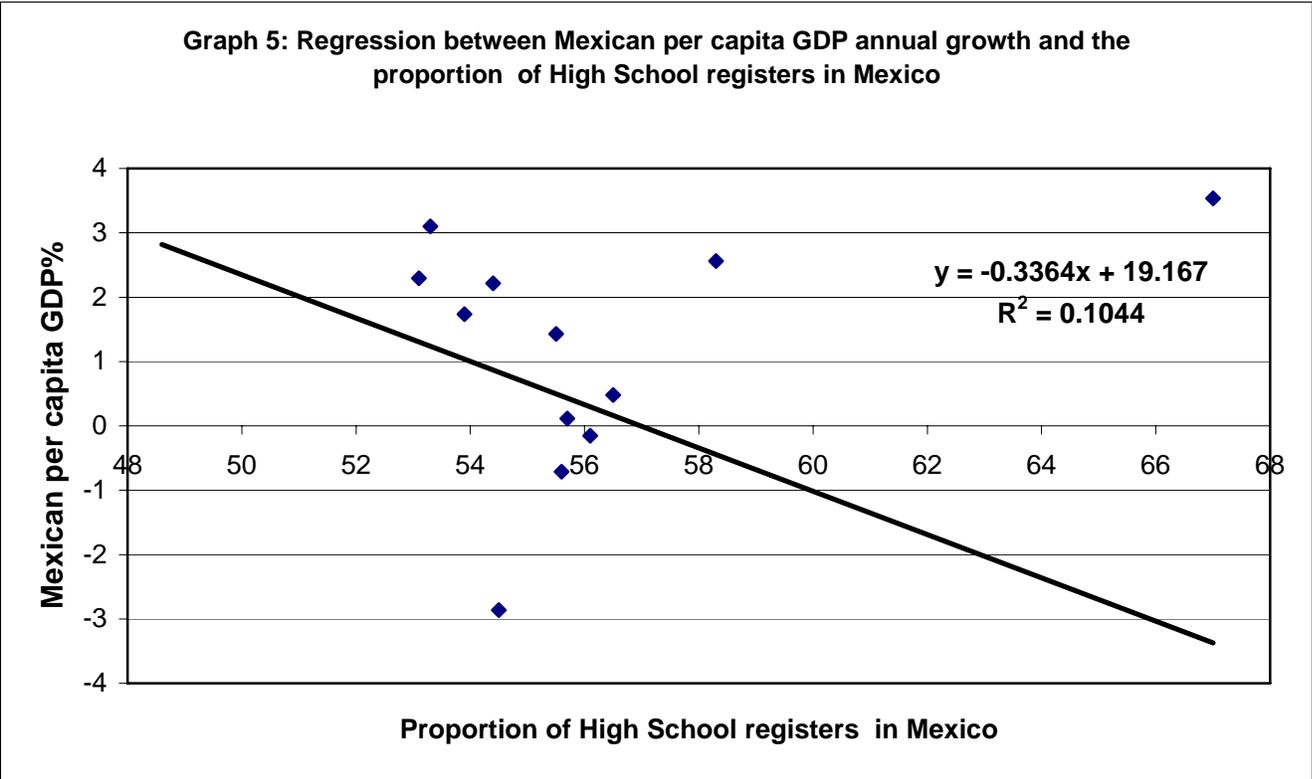
	Coefficient	Std. Error	T-Statistic	Prob.
C(1)	-4.732378	8.765193	-0.539906	0.5928
C(3)	0.582804	0.208366	2.797023	0.0084
C(4)	-0.958338	0.410303	-2.335684	0.0255
C(5)	-0.062201	0.015491	-4.015276	0.0003
C(6)	1.058073	0.256400	4.126647	0.0002
C(7)	-0.019830	0.069807	-0.284074	0.7781
C(8)	-1.650799	2.001186	-0.824910	0.4152
	R-squared		0.554937	

To a considerable extent, if government consumption C(4) increases by one percentage point of the gross domestic product, the product growth will be reduced by nearly a percentage point approximately. This way, government consumption has negative effects that are more intensive than those registered by price variation C(5).

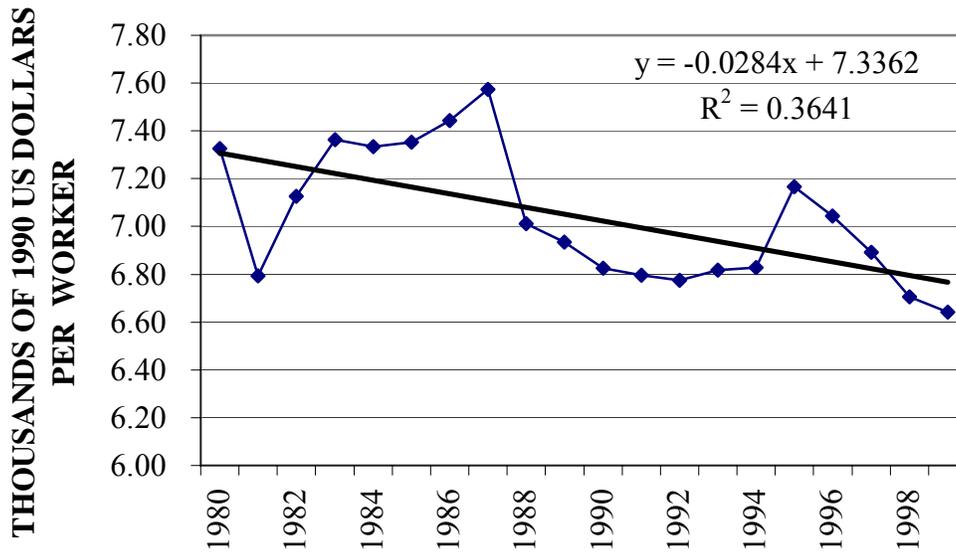
Gross fixed capital formation C(6) notably preserves the greater expansive effects on Mexican growth. In the Mexican case, it is alarming that this has not presented an increasing trend in the entire period.

Education is one of the variables that supposedly has a positive impact on growth. According to Romer-type models of growth (1990), efficiency in human capital investment is one of the most important variables determining the factors of growth. Even when it is true that there has been a remarkable improvement in the educational level of manpower, the outstanding thing about the Mexican case is the lack of a positive correlation between educational levels and growth, as shown in graph 5. A credible explanation for his phenomenon is that given the current Mexican labour market conditions of employers, education has turned out to be a mechanism for competition. Workers must accept low salaries and be in charge of activities inferior to their qualification. Attributable to these conditions, most of human capital investments have neither led to higher productivity nor to better income levels (Romero and Puyana, 2003).

The per worker capital endowment is another variable that has impacted growth, and is related to increases in productivity and economic growth. Even when it was not integrated into the equations, it is interesting to point out that, in the Mexican case, there has been a strongly negative trend during the 1980-2000 time period (graph 6). This negative trend explains the inverse relationship between the educational level improvement of labour force and economic growth. Therefore, it suggests that better qualified human resources have been given access to less equipment and technology, both of which are means to productivity and income growth.



GRAPH 6



VI CONCLUSIONS

After more than fifteen years of economic reforms, and ten since the NAFTA was set in motion, the effects announcing a change in the model and the integration with the United States' economy have not yet crystallised. Even though it is true that there have been periods of growth for the Mexican GDP, these have only been sporadic, and have not been fully shown as a sustained approach to the income and welfare levels of Mexico's NAFTA partners. The goal of this analysis is to determine whether there is a trend towards convergence in per capita income of NAFTA members.

The convergence registered from 1946 to 1980 has not been recovered, and today these economies are as divergent as they were 20 years ago. It is important then to explore the determiners of this behaviour, which was by no means expected neither by theoretical enlightenment, nor by those who had set their minds on demonstrating that convergence should have arisen once these economies had been integrated into the international market and more prosperous economies.

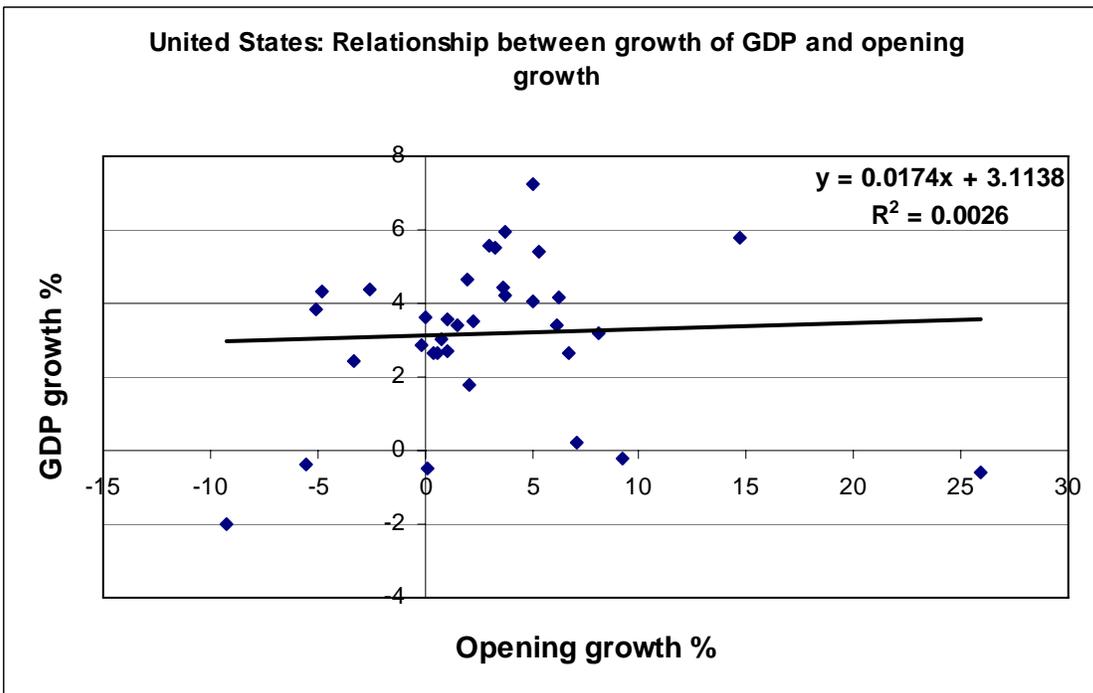
Our results provide those who have questioned the mechanical correlation between opening, foreign commerce and higher rates of growth, with a standpoint. They also side with those who remained sceptical in the face of this positive and undeniable correlation between integration and convergence.

One of the causes for this lack of convergence between Mexico and its NAFTA partners lies in the fact that Mexican investments, measured by the GKF, have not been energised to an appropriate extent. For Mexican investments to be a convergence factor, they should have given rise to a much greater growth. And the GKF Coefficient of GDP should have grown notably distant from the values registered for the United States and Canada.

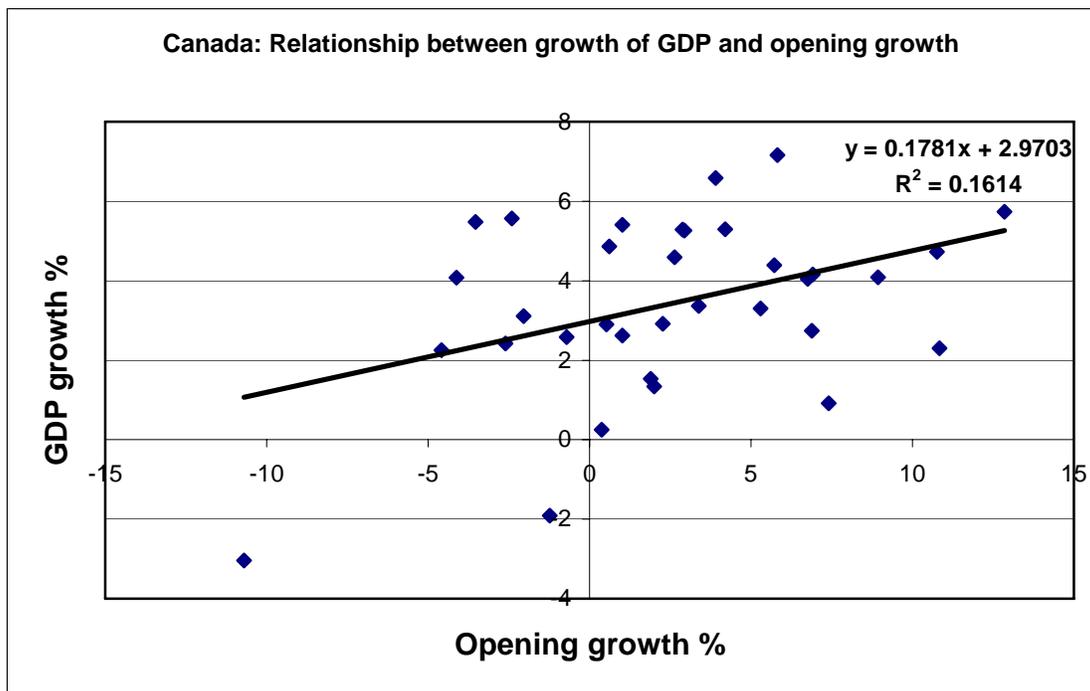
This analysis found a very restricted or non-existent correlation between the opening of an economy and growth in the Mexican case, and a positive relationship for Canada and the United States. It is essential to look into the causes of this phenomenon. One of the most likely explanations—not explored in this work—is the weight of the imported content in Mexican exports, which is approximately 60 per cent. Given these conditions, the multiplier factor of exports is reduced. Besides, when the income elasticity of imports is elevated, the external restrictions to growth are worsened.

APPENDIX

GRAPH 1



GRAPH 2



STATISTICAL DATA APPENDIX

- Per capita income of Mexico, Canada and the United States 1965-2000.
 - World Bank's rate of growth for Mexico, Canada and the United States 1965-2000.
 - Government expenditures of the three countries as percentage of GDP.
 - FBCF/GDP of the three countries.
 - Opening rate: Correlation between exports plus imports divided into the product.
 - Population rates of growth.
 - Per capita income logarithm in 1960 of the countries.
 - Inflation rate of the three countries, consumer price index.
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End Notes

ⁱ The authors are Hall and Jones (1999), Sachs and Warner (1995), Dollar and Kraay (2001), Alcalá and Gicoone (2001). Besides the opening effects, Hall and Jones have come up with a social infrastructure index, which refers to government management in the presence of corruption, expropriation risks etc., as well as data concerning territorial extension of common language, distance from the Equator, the GDP international share of the international market, demographic and geopolitical characteristics. There is a positive correlation between this index and per capita GDP logarithm.

ⁱⁱ The external rate of GDP is calculated as follows: $[(\text{Exports} + \text{Imports}) / \text{GDP}]$. It has been suggested that the external rate of GDP is a good and impartial measure for the opening (Sheeby, 1992; Easterly et al., 2001; Berg and Krueger, 2003; Dollar et al., 1995).

ⁱⁱⁱ Just like Dollar and Kraay (2001), and because the variables are measured in rates of growth, it is not necessary to test unitary roots and co-integration. In Arora & Vamvakidis (2001), per capita GDP in the first year is the approximation of convergence, which is part of a set of explanatory variables: population growth, fixed capital investment, inflation, government consumption and international trade share in GDP.

^{iv} The signs of government investment and consumption coefficients are equal to those found by Arora and Vamvakidis (2001). Using Dollar's (1992) direct foreign investment, we found that this foretells the growth in the same way that it does with the opening degree. Both variables are correlated.

^v This non-significant result is a part of a debate over the causation between economic growth and commercial opening. In relation to the hypothesis of trade opening as a source of economic growth and convergence, see, Ventura (1997); Grossman and Helpman (1991); Edwards (1998); Frankel and Romer (1998); Lucas (1988); Young (1991); Barro and Sala-i-Martin (1995); Dollar (1992); Sachs and Warner (1995); and Ben-David (1993). Neither Slaughter (2001) nor Rodríguez and Rodrik (1999) found evidence showing that trade liberalisation has positive effects on countries' speed of convergence.

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