

Getting Mexico to Grow With NAFTA: The World Bank's Analysis

Mark Weisbrot, David Rosnick, and Dean Baker¹

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CENTER FOR ECONOMIC AND POLICY RESEARCH • 1611 CONNECTICUT AVE., NW, SUITE 400
WASHINGTON, D.C. 20009 • (202) 293-5380 • <WWW.CEPR.NET> • EMAIL: CEPR@CEPR.NET

¹ Mark Weisbrot and Dean Baker are co-directors of the Center for Economic and Policy Research. David Rosnick is a research associate at the Center for Economic and Policy Research. John Schmitt and Todd Tucker had helpful comments on an earlier version of this paper.

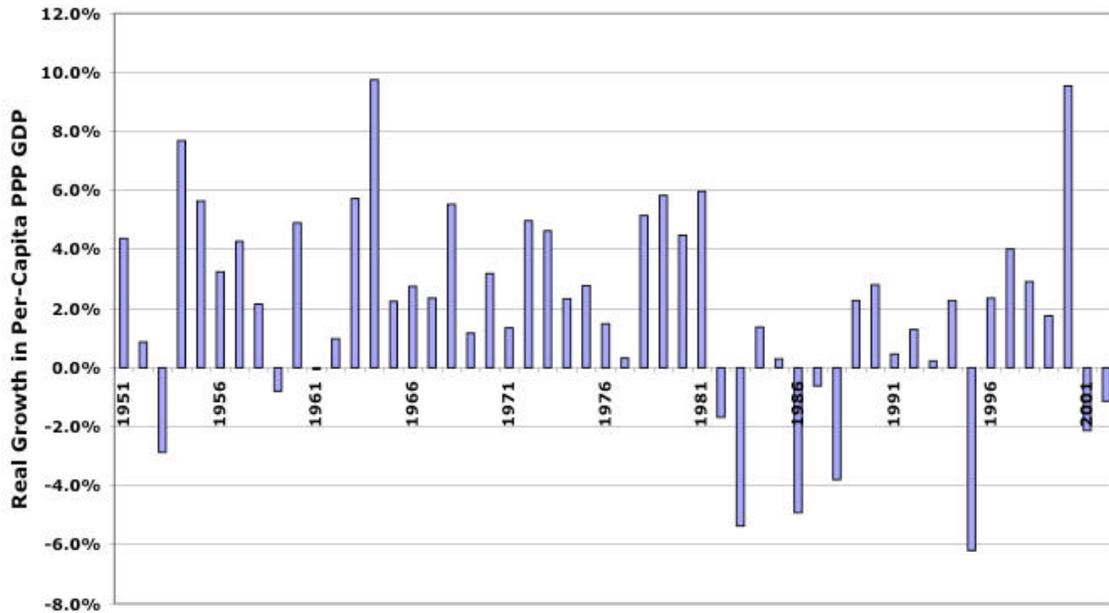
The North America Free Trade Agreement (NAFTA) was highly controversial at the time it was approved by Congress in 1993, and it remains highly controversial ten years later. There continues to be considerable debate over the impact of the agreement on the well-being of the populations of the three countries affected.

One issue that has been an area of contention in recent months has been the impact of NAFTA on Mexico's growth rate. In a book commemorating the tenth anniversary of the agreement, *Lessons From NAFTA for Latin America and the Caribbean Countries: A Summary of Research Findings*, the World Bank included a section that claimed that NAFTA increased Mexico's annual rate of GDP growth by approximately 0.5-0.7 percentage points since the passage of the agreement. Since the release of this report (which received considerable attention from the media), the section on Mexico's growth has been twice modified on the World Bank's website. One revised version finds less of a positive effect, but still concludes that NAFTA increased Mexico's growth rate over the period 1994-2002. This brief note examines the actual growth record of Mexico in the post-NAFTA period, compared to the prior periods, and then explains how the World Bank studies reach the conclusion that NAFTA led to more rapid growth in Mexico.

Growth in Mexico – The Basic Numbers

It is difficult to believe that NAFTA had a substantial positive impact on Mexico's growth rate simply because the actual record on growth has been so bad in the post-NAFTA period. Figure 1 shows Mexico's annual rate of real per capita GDP growth using data from the Penn World Tables, version 6.1 series RGDPCH. This data is usually accepted by economists, including those at the World Bank and the IMF, as being the most reliable data available.

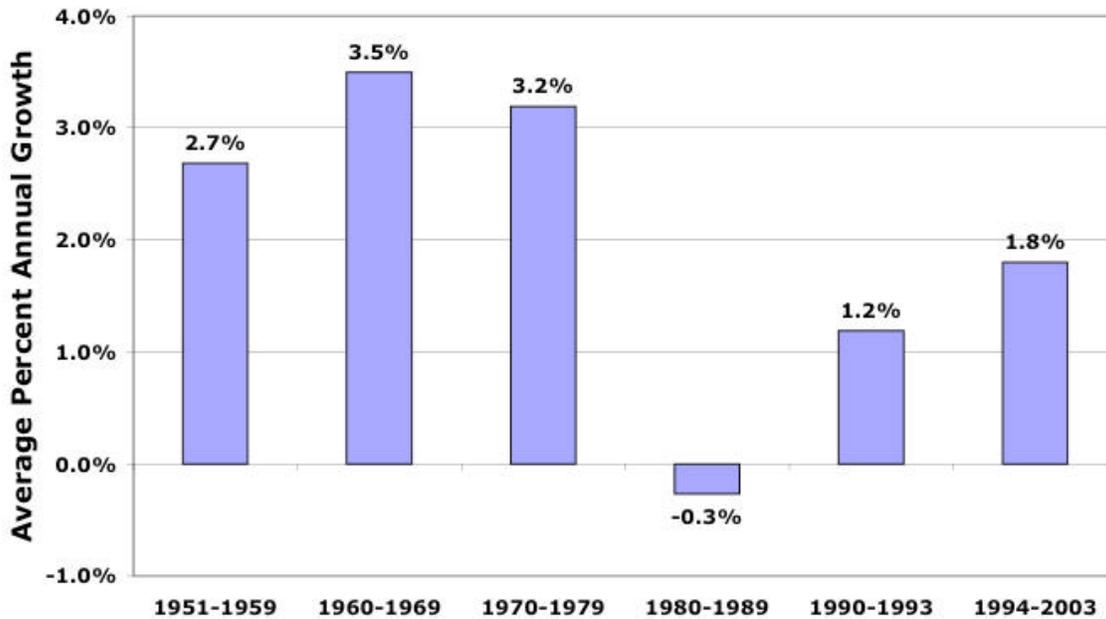
Figure 1: Annual Growth in Per-Capita GDP (1951-2002)



Sources: Penn World Tables 6.1 (1951-2000) and Spring 2004 World Economic Outlook (2001-2002)

Following a 6% decline in 1995, the data show annual growth of only 2.1% from 1996-2003, driven primarily by a 9.5% jump in 2001. Since NAFTA went into effect in 1994, Mexico has averaged 1.8% real per-capita GDP growth. By contrast, through much of the sixties and seventies Mexico had per capita GDP growth that often exceeded 4 percent, and in some years exceeded 7 percent. The relatively weak growth in the post-NAFTA period can be easily demonstrated by comparing it with decade long averages as shown in figure 2.

Figure 2: Growth in Real Per-Capita PPP GDP by Decade



Sources: Penn World Tables 6.1 (1951-2000) and Spring 2004 World Economic Outlook (2001-2003)

Since Mexico's growth rate has been so much slower in the post-NAFTA period, than in the period from 1951 to 1979, it is difficult to believe that NAFTA led to any substantial increase in growth. This growth is especially bad since developing countries should have much more rapid growth than rich countries. Successful developing countries, such as South Korea and Taiwan, or more recently China, have sustained per capita GDP growth rates or more than 5 percent annually for long periods of time.

While it is possible that Mexico would have grown even less without NAFTA, the implication of the World Bank's initial study was that Mexico's per capita GDP growth would have been 1.1 to 1.3 percent over the last decade in the absence of NAFTA. This would be an extraordinarily bad performance for any country, especially a developing country.

In fact, a simple regression testing the impact of NAFTA on Mexico's growth rate clearly shows that NAFTA was not associated with faster economic growth.

Let

$$G_{t/t-1} = a + b \times NAFTA_t$$

where $G_{t/t-1}$ is the growth in real, per capita PPP GDP from year t-1 to year t, and $NAFTA_t$ is a dummy variable indicating the NAFTA period (1994-) and t runs from 1951 to 2003.

Table 1: Regression Results

	a	b
Mean	0.0220***	-0.0089
Std. Err.	0.0051	0.0119

*** significant at the 1 percent level.

The coefficient of the NAFTA terms is negative, although not statistically significant. If NAFTA increased Mexico's growth rate, the coefficient of the NAFTA dummy should be positive and significant, indicating that Mexico grew more rapidly in the post-NAFTA period than it had previously. This sort of simple regression is far from conclusive since it makes no effort to control for many other factors that affected growth over the last fifty years, but it does provide a basis for skepticism about claims that NAFTA increased Mexico's growth rate.

How the World Bank Finds NAFTA Raised Growth I

In its initial study, the World Bank used the ratio of Mexico's per capita GDP to per capita GDP in the United States as its dependent variable. There is no obvious reason why this should have been viewed as a test of NAFTA's impact on Mexico's growth. Presumably NAFTA was too inconsequential to have an impact on U.S. GDP growth, in which case the ratio provides no additional information compared with simply using Mexico's growth rate. However, the impact of country-specific factors on the U.S. growth rate (such as the IT boom of the late nineties or the stock crash induced recession in 2001) could add noise to the regression, making it a less useful measure of the impact of NAFTA on Mexico's growth.

However this is a far less serious issue than the method that the analysis used to construct the ratio. The study began with a real growth series using Mexican pesos as the unit of measurement.² In order to make a comparison with per capita GDP levels in the United States it then had to convert the peso measures into dollars. This conversion can be done in two ways:

- 1) use the market exchange rate to convert from pesos to dollars, or
- 2) use purchasing power parity measures that are intended to assess what people in Mexico and people in the United States could buy with their income, if they both faced the same set of prices.

Virtually all economists agree that the second measure is the appropriate way to measure income across countries. In many developing countries, exchange rate

² The World Bank began with the current-peso series from the OECD Quarterly National Accounts. They then seasonally adjusted the data.

conversions imply that living standards are far lower than is actually the case. For example, an exchange rate conversion measure places China's per capita income at just over \$1,000 per year, ranking it among the poorest countries in the world. By contrast, China's per capita income on a purchasing power parity basis is close to \$5,000 a year, placing it among the better off developing countries.

An exchange rate conversion also leads to erratic fluctuations in per capita GDP, since exchange rates are far more volatile than growth rates. While the average size of the absolute value (positive or negative) of annual change in Mexico's GDP from 1970 to 2001 was 4.8 percent, the average size of the absolute value of the annual change in the real exchange rate was 11.2 percent. If an exchange rate conversion measure was used, Mexico's per capita GDP would show a sharp jump any time there was a rise in the real value of the peso against the dollar and a sharp decline whenever the real value of the peso fell against the dollar. The authors of the World Bank study are aware of this problem and correctly use a purchasing power parity (PPP) measure of per capita GDP. Unfortunately, the PPP measure they use for their analysis retains the problem of using an exchange rate measure.

The study relies on a PPP series from the Penn World Tables 5.6. However, the Penn World Tables provide only annual data. Thus, the authors must estimate quarterly PPP data. To convert from Mexican pesos to a PPP measure of GDP in dollars, the study first converts to dollars using an exchange rate conversion, then deflating by the U.S. CPI to obtain a constant-dollar series. It then converts from per capita GDP based on an exchange rate measure to per capita GDP based on a PPP measure using the results of a regression relating Mexican GDP on a PPP basis to Mexican GDP on an exchange rate basis.

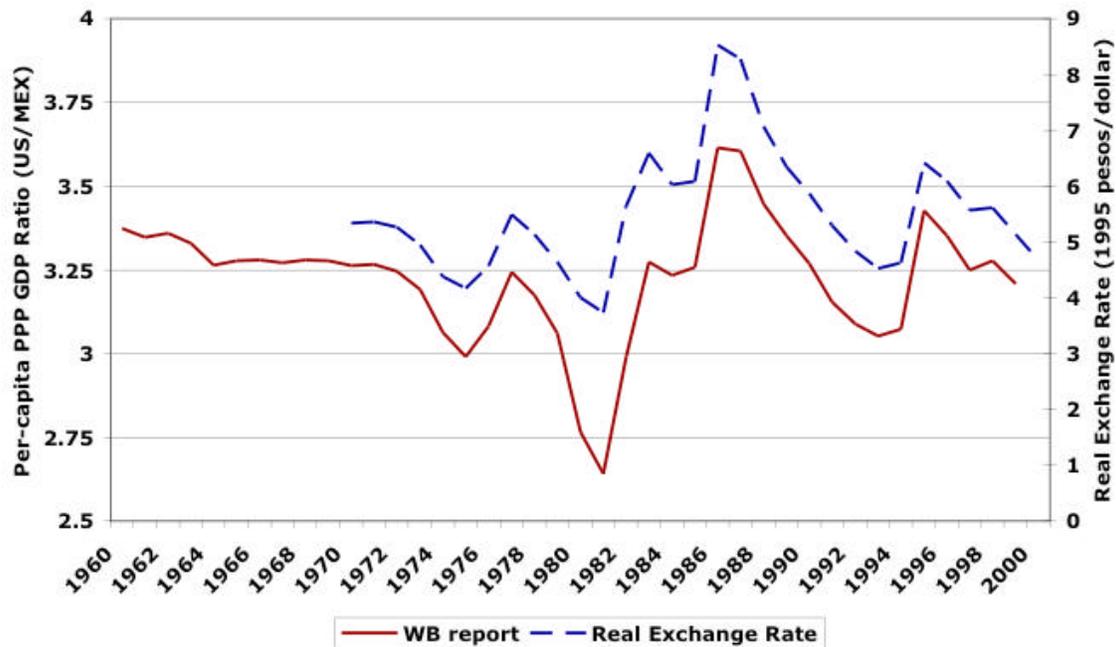
The problem with this method is that it allows movements in the real exchange rate to dominate actual growth – exactly the problem that economists seek to avoid by using PPP measures of real GDP. In short, movements in the real value of the exchange rate are driving this measure, not growth in Mexico.

This creates the possibility of NAFTA appearing to promote growth in Mexico. In 1994, the first year the agreement took effect, there was a sharp drop in the real value of the peso due to the "tequila crisis." However, the effect of this downturn is assigned to a "tequila dummy" in the World Bank regression, not to NAFTA. In the years since the Tequila crisis, there has been a modest increase in the real value of the Mexican currency relative to the dollar. This increase in the real value of the peso raises Mexico's growth rate by a little more than 1 percentage point a year using the PPP measure of per capita GDP constructed in the World Bank study, although it would not have this effect using standard PPP measures of per capita GDP. In other words, constructing a PPP measure of per capita GDP with the methodology used in the World Bank study biased the analysis toward finding that NAFTA increased growth in Mexico.

How the World Bank Finds NAFTA Raised Growth II

In May, the World Bank placed a new version of this analysis on its website.³ This new version used a slightly different methodology. First, the regression data started with PPPs from the Penn World Tables 6.1, rather than version 5.6. Mexico's quarterly PPPs were estimated by regressing the annual PPP GDP series for Mexico against an exchange rate GDP series.⁴ These PPP estimates still fail to separate the real economy from variation in the real exchange rate, as seen in Figure 3 below. In principle, there should be almost no relationship between movements in the real exchange rate between the dollar and the peso and the ratios of real per capita income in Mexico and the United States.⁵ In fact, these estimates do not correspond well to established data. According to the Penn World Tables, the ratio of per-capita GDPs in 1999 was 4.0, compared to the World Bank's 3.25. This error corresponds to an overestimate of the size of the Mexican economy by nearly 25%.

Figure 3: Ratio of Estimated Per-Capita GDP and Real Exchange Rate



³ The website does not identify the new version as being revised, so only those who had closely followed the progress of the study would realize that it had been changed.

⁴ The actual regression was $\ln\left(\frac{US_{PPP}}{MEX_{PPP}}\right) = a + b \ln\left(\frac{US_{XR}}{MEX_{XR}}\right)$ where US is the per-capita GDP in the United States, and MEX is the per-capita GDP in Mexico.

⁵ A lower value of a country's currency means that import prices will be somewhat higher, which will lower real per capita income slightly. For example, if imports are 20 percent of GDP, and the real value of the currency falls by 5 percent, and half of this fall in the currency is translated into higher prices (a standard assumption), then real GDP will fall by 0.5 percent ($20\% * 5\% * 0.5 = 0.5\%$).

The growth regression was based on the log of the ratio of per-capita GDP, rather than simply the ratio. Six regressions were presented, with dummy variables both interacted and not interacted with the lagged log ratio, and at times with dummies marking certain economic crises in Mexico.

This methodology, using the exchange rate driven measures of per capita GDP, did generate the result that NAFTA raised Mexico's growth rate. However, even in this case the implications are not quite as positive as supporters of the agreement might hope. The results from the regression imply that Mexico's GDP was approximately 8 percent higher than would have been the case without NAFTA in 1997, soon after the Tequila crisis. However, in subsequent years, NAFTA actually led to slower growth, so that the gap between Mexico's per capita GDP with NAFTA and its per capita GDP without NAFTA has gradually been declining. By 2002, the last year included in the analysis, the regression results imply that Mexico's per capita GDP was just 4.1 percent higher due to NAFTA.

Furthermore, if the regression coefficients are used to project out beyond the period of analysis, the results imply that NAFTA's cumulative effect on growth will be zero as of 2007. In subsequent years, the results imply that NAFTA's effect on Mexico's per capita GDP will be negative. This negative impact increases over time, albeit at a slower rate. By 2016, the World Bank's regression results imply that NAFTA will have lowered Mexico's per capita GDP by 4.3 percent.

Conclusion

The Evidence Does Not Support Claims That NAFTA Increased Growth in Mexico

The basic facts concerning Mexico's growth in the post-NAFTA period are straightforward. Its growth has been extremely weak in this decade by any measure. While NAFTA may not be the cause of Mexico's weak growth, it is very hard to make the case that Mexico's aggregate economic performance would have been even worse without NAFTA. The World Bank analysis applies flawed econometric analysis that appears to make this case. When the flaws are corrected (or when the results are read more carefully), it turns out that in no version does the study show that NAFTA led to more rapid GDP growth in Mexico. While there are other bases for assessing the benefits and costs of NAFTA, the World Bank's analysis does not provide a basis for supporting claims that NAFTA increased growth in Mexico.