

NAFTA at Ten: The Recount

By Mark Weisbrot, David Rosnick, and Dean Baker¹

March 1, 2004
(revised March 10, 2004)

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.

NAFTA at Ten: The Recount

Executive Summary

The World Bank recently released a study, marking the tenth anniversary of the NAFTA agreement that focused on the agreement's impact on Mexico's development. This study included a widely cited section that tested the effect that NAFTA had on Mexico's per capita GDP growth. The test used in the study found that NAFTA increased Mexico's per capita GDP by an extra 4-5 percentage points by the end of 2002.

This paper examines the basis for this result. It shows that the per capita GDP data used for the World Bank's test is widely out of line with per capita GDP data from all authoritative sources, including the Penn World Tables, the OECD, and the International Monetary Fund's *World Economic Outlook*. The per capita GDP ratios used in the World Bank study imply that the United States had a per capita GDP of nearly \$21,000 in 2000. This is approximately one-third below the level estimated by these other sources, which place the United States' per capita GDP in 2000 at no less than \$31,000.

When data from these other sources is used in the same regression that appears in the World Bank study, the result is reversed. In nearly every specification, the regression results indicate that NAFTA slowed the rate of growth in Mexico.

While this test cannot be viewed as conclusive, it is worth noting that when generally accepted data are used in the World Bank's test, the results show that NAFTA reduced growth in Mexico -- the opposite of the results obtained by the World Bank study.

NAFTA at Ten: The Recount

On the occasion of the tenth anniversary of the North America Free Trade Agreement (NAFTA) the World Bank released a study entitled *Lessons From NAFTA for Latin America and the Caribbean Countries: A Summary of Research Findings* (Advance Edition). The study, collecting information from a number of previous works, assessed the impact of the trade pact, primarily on Mexico. While the study contained much useful analysis, a disproportionate amount of attention was devoted to a short section that presented an econometric test of the impact of NAFTA on the rate at which Mexico's per capita GDP converged with the level of per capita GDP in the United States. Based on this test, the section concluded that NAFTA increased Mexico's GDP by approximately 4-5 percent over eight years.

While economists were immediately skeptical of this finding, others were quick to embrace the result as proof of the benefits of NAFTA both in editorials (e.g. "Free-Trade Successes," Jackson Diehl, *Washington Post*, December 22, 2003:A24 and "NAFTA at 10," *Washington Post*, January 9, 2004:A16) and in features ("Free trade on trial - Ten years of NAFTA," *The Economist*, January 3, 2004). This study seemed to support their contention that NAFTA, and other recent trade pacts, have improved the lives of poor people in the developing world.

The study estimated an increase of 4-5 percentage points in Mexico's GDP from 1994-2002, a significant gain suggesting that the agreement had provided important benefits for Mexico. However, there is an obvious problem with this assessment when one looks at the established economic data on Mexico. With NAFTA, Mexico's actual annual rate of per capita GDP growth over this period was about 1.0 percent. This implies that the annual growth rate would have been less than 0.5 percentage points without NAFTA.

This would be an extremely poor performance for any country. Even rich countries such as the United States generally have much more rapid per capita GDP growth. For example, in the United States per capita GDP grew by an average of 2.0 percent annually from 1980 to 2001. Developing countries are expected to have much more rapid GDP growth, since they can benefit from adopting the technology developed by rich countries. This is why success stories such as South Korea and Taiwan were able to sustain per capita GDP growth averaging more than 6.0 percent over forty years; or in Latin America, why Mexico's per capita GDP growth had averaged 4.1 percent in the years from 1960 to 1980.

Per capita GDP growth in developing countries averaged 2.9 percent annually in the period from 1970 to 1980. In the period from 1980 to 2000, growth in the developing world fell to just 1.2 percent. But, even this lower figure is still far above the World Bank's estimate of a 0.5 percentage point growth rate in Mexico in the absence of NAFTA. For this reason, it is worth re-examining how the study generated this result.

Getting to 0.5 Percent: The World Bank's Methodology

The estimate that NAFTA increased Mexico's rate of economic growth by 0.5 percentage points over the last decade was generated from the following regression equation:

$$GAP_t = \alpha + (\beta + \gamma LIB_DUM_{t-1} + \delta NAFTA_DUM_{t-1})GAP_{t-1} + \varepsilon TEQUILA_DUM_t$$

where GAP is the PPP-adjusted per-capita GDP for the United States, divided by that of Mexico, LIB_DUM is a dummy variable for Mexico's unilateral liberalization (1986-1994), NAFTA_DUM is a dummy for NAFTA (1995-2002), and TEQUILA_DUM is a dummy for the Tequila crisis (1995).

The basic structure of this regression is relatively straightforward. In principle, if NAFTA caused Mexico's per capita GDP to rise at a rate more rapid relative to that in the United States, then the coefficient of the NAFTA variable (δ) would be negative and significant. Similarly, if the post-1986 liberalization led to increased growth in Mexico relative to the United States, the liberalization coefficient (γ) would be negative and significant.

While not directly relevant to the most important error in this study, there are two unusual features concerning the structure of this regression that are worth noting. First, the dependent variable is the ratio of per capita GDP between the two countries. The implicit assumption is that convergence would be the result of Mexico's GDP growing more rapidly. However, convergence could also be the result of the U.S. economy growing more slowly. It is unlikely that NAFTA could have had a large enough negative impact on growth in the U.S. economy to substantially affect the rate of GDP convergence. However, if NAFTA did lead to substantially slower growth in the U.S., this regression would show that it increased the rate of convergence, even if it had no impact whatsoever on Mexico's rate of GDP growth. Since the regression is intended to measure the impact of a policy that had presumably had an effect on the growth of both nations, it would have been more appropriate to use a test that focused on Mexico's GDP growth alone.

The second noteworthy feature of this regression is that it includes a dummy variable for the peso crisis, essentially treating the large drop in the peso in 1994 as an exogenous event unrelated to the process of liberalization or NAFTA. This assumption is questionable for two reasons. First, the peso crisis cannot be viewed as exogenous. In the period prior to the peso crisis, the Mexican government pegged the peso at a level against the dollar that was widely recognized as being over-valued. There were clearly political considerations behind this decision, some of which had to do with winning the approval of NAFTA by the U.S. Congress. The impact of the currency devaluation was also accentuated by Mexico's increased integration into the world economy. Had Mexico not gone the route of increased liberalization over the prior decade, the impact of a currency devaluation would not have been as serious.

In the same vein, there is no obvious rationale for treating the 1994 peso crisis differently from negative shocks in the period prior to liberalization. For example, it would have been at least as appropriate to pull out the 1974-75 world recession as an exogenous

crisis, so that Mexico's poor performance in these years would not be counted against its overall growth rate in the period prior to liberalization. There is no obvious rationale for treating shocks differently in the post-liberalization period than in pre-liberalization period, as this regression does.

Figure 1a. The U.S.-Mexico GDP per Capita Gap: Similar-Cycle Model with Quarterly PPP Adjusted Data, 1960-2002.

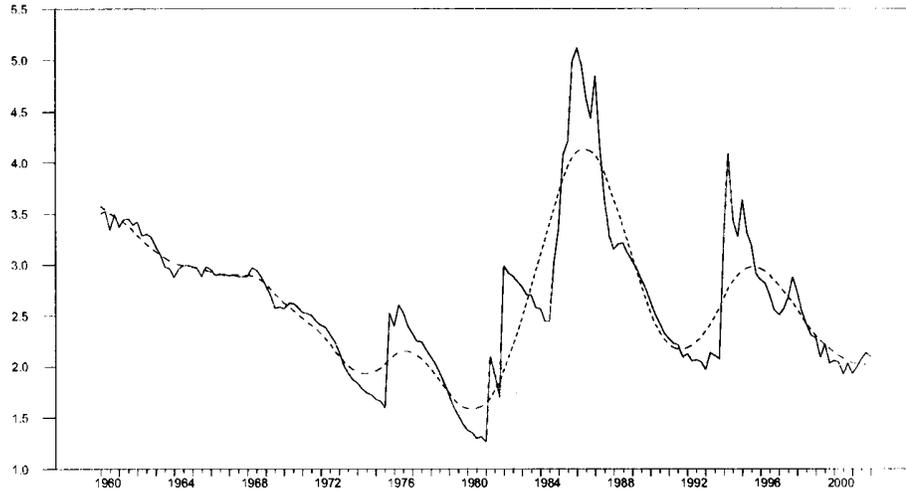
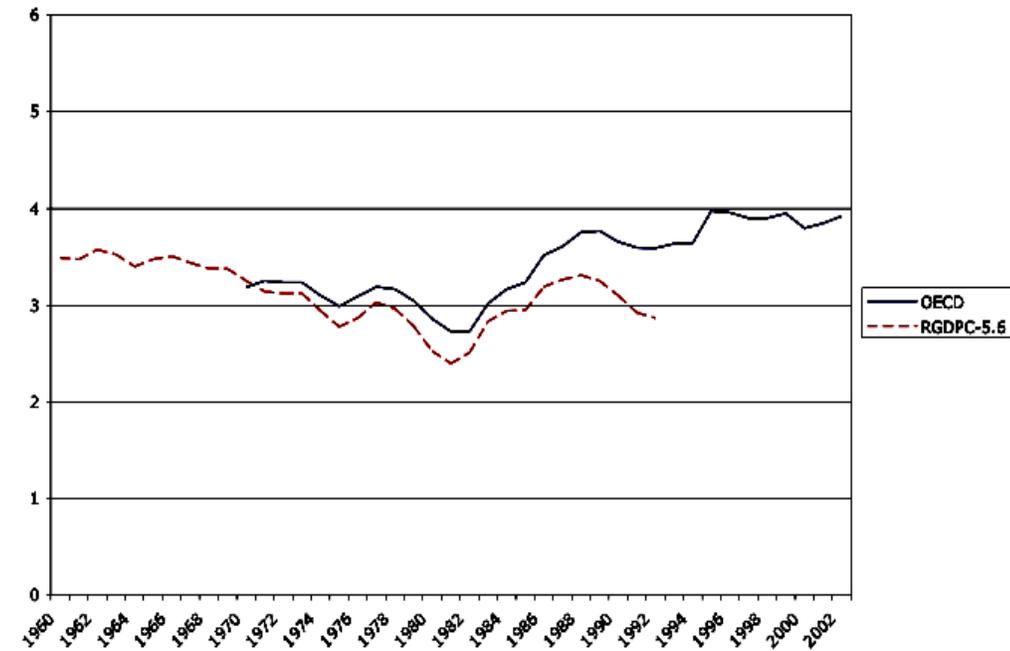


Figure 1b: PPP-adjusted per-capita GDP (U.S./Mexico)



Sources: Penn World Tables 5.6 series RGDP and OECD ANAPart31970 (PPP GDP), ANAPart4 (population)

Even accepting the serious flaws in the design of the study, there are worse problems. The main problem is that the World Bank apparently used erroneous data in running its tests. This fact is easily verified by examining Figure 2 of Chapter 1 in the World Bank article (reproduced as figure 1a below). This figure shows the ratio of per capita GDP in the United States to per capita GDP in Mexico over the years 1960-2000. The ratios shown in this chart are far out of line with any standard estimates of per capita GDP in the two countries. For example, by 2000, the figure shows the ratio to be approximately 2 to 1. According to the Penn World Tables, which are generally accepted as the most authoritative source for purchasing power parity measures of GDP, per capita GDP in the United States was \$33,293 in 2000, while per capita GDP in Mexico was \$8,762 (PWT 6.1, series RGDPCH). This implies a ratio of 3.8 to 1.

If the U.S. had only twice the per capita GDP of Mexico, this would imply for the U.S. a significantly lower standard of living than is generally accepted. At \$16,714, the United States' per-capita GDP would fall between that of Portugal and New Zealand (see Table 1) at a level nearly one-third below any other measure and well below the OECD average. As the OECD data shows, the per capita GDP of the United States was \$31,741 in 2000, or 3.8 times that of Mexico's \$8,357.

Table 1: OECD per-capita GDP ratios in 2000

Country	Country GDP per capita/ Mexico GDP per capita ²	Per-capita GDP
Luxembourg	5.06	\$42,310
United States	3.80	31,741
Norway	3.31	27,638
Switzerland	3.29	27,533
Ireland	3.24	27,087
Iceland	3.20	26,785
Canada	3.11	26,022
Austria	3.10	25,883
Netherlands	3.02	25,247
Denmark	3.01	25,156
Sweden	2.97	24,849
Belgium	2.93	24,494
Australia	2.86	23,294
Japan	2.85	23,836
Finland	2.83	23,662
Germany	2.79	23,343
France	2.78	23,206
Italy	2.71	22,676
OECD	2.70	22,544
United Kingdom	2.69	22,514
Euro Area	2.67	22,307
Spain	2.24	18,686
New Zealand	2.21	18,510
Portugal	1.87	15,632
Greece	1.79	14,979
Korea	1.67	13,930
Czech Republic	1.54	12,839
Hungary	1.33	11,112
Slovak Republic	1.15	9,649
Poland	1.13	9,407
Mexico	1.00	8,357
Turkey	0.73	6,077

In fact, the ratios shown in the figure are inconsistent throughout with the data in the Penn World tables or any other accepted source of GDP data. (The World Bank article indicates that its data was derived from data in the Penn World tables 5.6 and the OECD.) Some of the difference between the values shown in the figure and the data in the Penn World tables is attributable to the authors' efforts to pull out cyclical movements in per capita GDP. While pulling out cyclical fluctuations can be helpful in testing many questions, a proper cyclical adjustment cannot qualitatively alter the overall path of GDP growth. It only affects the annual or quarterly pattern of growth. Clearly, the World Bank used erroneous numbers in this test.

² Based on OECD Annual National Accounts: 1995 prices and 1995 PPP GDP per-capita.

Figure 1b shows the ratio of per capita GDP in the United States to per capita GDP in Mexico using separate data from the Penn World Tables 5.6 and the OECD. As can be seen, in both series the ratio is much more stable than what was presented in the World Bank paper, and the OECD series show a widening, not narrowing gap between the two countries.

The study's finding that NAFTA led to more rapid GDP growth in Mexico is entirely dependent on the use of the erroneous data shown in Figure 1a. Table 2 shows a set of regression results using the same regression as in the World Bank study, but relying on authoritative data sources for per capita GDP data.³

The top row in the table shows the regression results as they appeared in the World Bank study. The coefficient of the NAFTA variable is negative and significant (though only at the 10% level), indicating that the post-NAFTA period was associated with a more rapid rate of convergence. The coefficient of the Tequila dummy is positive and significant, which means that the Tequila crisis was associated with a larger divergence between per capita GDP in the United States and Mexico.

However, this is the only data that generates such a result. The identical regression, run with data from available authoritative sources, either shows no effect from NAFTA, or shows that NAFTA was associated with increased *divergence* in per capita GDP levels between Mexico and the United States.⁴ For example, the results from the regression using the RGDPEA series from the Penn World Tables,⁵ which appear in the second row, show that there is a significant positive relationship between both liberalization (at the 5% significance level) and NAFTA (at the 10% level) and the divergence in per capita income between the two countries. This effect is even stronger (both significant at the 1% level) in the regression whose results are shown in the fourth row, which uses the same data, but excludes the Tequila crisis dummy (effectively treating the crisis as an endogenous feature of this period). The regression results shown in the sixth row show exactly the same story, although this time the data source is the (GDP per worker) RGDPW series from the Penn World Tables. (See Appendix Table 1 for explanation of the regressions in Table 2 below.)

In every series for which there is data available back to 1970 or earlier, the NAFTA period is associated with an increasing divergence in per capita GDP between Mexico and the United States. This effect is stronger using series that go back further and in regressions that exclude the Tequila crisis dummy variable. In short, the methodology used in the World Bank's study, when applied to data from any generally accepted source, shows that NAFTA slowed GDP growth in Mexico.

³ It is worth noting that these regressions do not try to control for cyclical fluctuations, as does the series in the World Bank study. This could reduce the likelihood of finding a statistically significant relationship (in either direction), but it should not bias the results.

⁴ These data sources are not independent – much data is shared between organizations. The reason for showing results from common data obtained from two different sources is simply to demonstrate that no data from an authoritative source will generate results that resemble those which appear in the World Bank study.

⁵ The RGDPEA series is actually real per capita GDP per equivalent adult, not per capita.

Table 2: The Impact of NAFTA on the ratio of U.S./Mexico per Capita GDP

	Constant	GAP	LIB	NAFTA	TEQUILA	RHO
1	0.162(0.092)*	0.935(0.032)**	0.005(0.016)	-0.025(0.013)*	1.083(0.136)**	?
2	0.714(0.3)**	0.733(0.112)***	0.059(0.022)**	0.066(0.033)*	0.264(0.109)**	-
3	0.844(0.394)**	0.687(0.147)***	0.059(0.029)*	0.074(0.044)	0.236(0.106)**	0.323(0.225)
4	0.893(0.309)***	0.666(0.116)***	0.069(0.023)***	0.095(0.033)***	-	-
5	1.907(0.452)***	0.317(0.161)*	0.042(0.038)	0.13(0.048)**	-	0.818(0.186)***
6	0.474(0.185)**	0.767(0.09)***	0.051(0.019)**	0.053(0.026)**	0.17(0.083)**	-
7	0.609(0.275)**	0.703(0.135)***	0.053(0.028)*	0.063(0.038)	0.163(0.079)**	0.364(0.227)
8	0.54(0.19)***	0.734(0.092)***	0.056(0.02)***	0.071(0.025)***	-	-
9	1.368(0.344)***	0.347(0.165)**	0.047(0.038)	0.125(0.047)**	-	0.787(0.176)***
10	0.988(0.394)**	0.672(0.132)***	0.061(0.024)**	0.071(0.035)**	0.263(0.12)**	-
11	1.15(0.488)**	0.621(0.163)***	0.061(0.03)**	0.079(0.044)*	0.233(0.116)*	0.323(0.242)
12	1.223(0.399)***	0.593(0.133)***	0.073(0.024)***	0.1(0.034)***	-	-
13	1.726(0.493)***	0.431(0.164)**	0.073(0.033)**	0.131(0.043)***	-	0.488(0.26)*
14	0.927(0.37)**	0.693(0.122)***	0.057(0.022)**	0.065(0.032)*	0.266(0.116)**	-
15	1.087(0.474)**	0.643(0.157)***	0.056(0.028)*	0.072(0.042)*	0.236(0.113)**	0.327(0.239)
16	1.149(0.377)***	0.62(0.125)***	0.067(0.022)***	0.092(0.031)***	-	-
17	1.887(0.499)***	0.386(0.164)**	0.062(0.033)*	0.131(0.043)***	-	0.62(0.263)**
18	0.676(0.341)*	0.773(0.115)***	0.042(0.023)*	0.042(0.033)	0.4(0.143)***	-
19	0.876(0.469)*	0.71(0.158)***	0.037(0.032)	0.05(0.046)	0.356(0.138)**	0.369(0.269)
20	0.914(0.359)**	0.693(0.121)***	0.054(0.025)**	0.076(0.033)**	-	-
21	2.153(0.549)***	0.31(0.175)*	-0.005(0.045)	0.106(0.057)*	-	0.85(0.137)***
22	0.751(0.372)*	0.747(0.126)***	0.046(0.025)*	0.048(0.036)	0.401(0.147)***	-
23	0.947(0.488)*	0.685(0.166)***	0.042(0.034)	0.056(0.048)	0.358(0.142)**	0.356(0.273)
24	1.019(0.389)**	0.657(0.132)***	0.061(0.027)**	0.085(0.036)**	-	-
25	2.176(0.549)***	0.302(0.176)*	-0.005(0.046)	0.108(0.058)*	-	0.845(0.142)***
26	0.681(0.504)	0.785(0.164)***	0.032(0.029)	0.038(0.037)	0.295(0.127)**	-
27	0.987(0.617)	0.693(0.199)***	0.027(0.035)	0.053(0.048)	0.254(0.116)**	0.519(0.36)
28	0.993(0.523)*	0.684(0.17)***	0.047(0.03)	0.067(0.038)*	-	-
29	2.059(0.612)***	0.375(0.187)*	0.011(0.038)	0.098(0.047)**	-	0.821(0.184)***
30	-0.061(0.635)	1.057(0.204)***	-0.042(0.041)	-0.046(0.045)	0.391(0.132)***	-
31	1.179(0.658)*	0.702(0.203)***	-0.017(0.037)	-0.007(0.044)	0.312(0.106)**	0.464(0.569)
32	0.529(0.721)	0.867(0.232)***	-0.008(0.047)	0.003(0.05)	-	-
33	3.074(0.743)***	0.169(0.214)	0.001(0.039)	0.07(0.048)	-	0.744(0.142)***

* indicates significance at 10% level, ** 5% level, *** 1% level. Standard errors in parenthesis.⁶

⁶ “Constant” refers to the regression coefficient for the constant, “GAP” to that of the lagged ratio of the per-capita GDPs, “LIB” to the coefficient on the lagged liberalization dummy, “NAFTA” to the coefficient on the lagged NAFTA dummy. Where appropriate (see Table 3) “TEQUILA” refers to the coefficient on the crisis dummy variable and “RHO” refers to the coefficient for the lagged residual for the AR(1) equivalent model correcting for autocorrelation in the residuals. The basic regression reflects the equation described above: $GAP_t = \alpha + (\beta + \gamma LIB_DUM_{t-1} + \delta NAFTA_DUM_{t-1})GAP_{t-1} + \varepsilon TEQUILA_DUM_t$. More details on the data and structure of the regressions may be found in Appendix Table 1.

It would be appropriate to view these results with caution. There were many other policy changes in these two decades other than trade liberalization and NAFTA, so these policies cannot necessarily be blamed for Mexico's slower growth during this period without looking at other policy changes. However, tests of the sort used in the World Bank study, when performed with data from standard sources, clearly do not support the opposite claim – that NAFTA led to increased growth. That study's result is clearly dependent on a mistake in the construction of its data.

Conclusion

There are grounds for debating whether Mexico was a net gainer or loser from NAFTA. However, given the poor growth performance by Mexico in the post-NAFTA decade, it is difficult to contend that NAFTA increased Mexico's growth rate during this period. The World Bank's evidence for this claim rests on a test performed with mistaken data. When the same test is performed using standard data sources, it shows that NAFTA was associated with slower growth. Contrary to the claims of the World Bank study, the World Bank's own analysis, properly done, would suggest that NAFTA led to slower growth in Mexico over the last decade.

Appendix

Appendix Table 1: Information on Regressions

Regression Number	Data Source	Years	Data Series	Includes Tequila dummy?	Corrects for autocorrelation in errors?
1	World Bank Report	1960-2002		Yes	?
2	Penn World Tables 6.1	1960-2000	Real GDP chain per equivalent adult (RGDPEA)	Yes	No
3				Yes	Yes
4				No	No
5				No	Yes
6				Yes	No
7		1960-2000	Real GDP chain per worker (RGDPW)	Yes	Yes
8				No	No
9				No	Yes
10				Yes	No
11		1960-2000	Real GDP per capita (Chain) (RGDPCH)	Yes	Yes
12				No	No
13				No	Yes
14				Yes	No
15		1960-2000	Real GDP per capita (Laspeyres) (RGDPL)	Yes	Yes
16				No	No
17				No	Yes
18				Yes	No
19		1960-2000	Adjustment for Changes in the Terms of Trade (RGDPTT)	Yes	Yes
20				No	No
21				No	Yes
22				Yes	No
23		1960-2000	Real GDP per capita (CGDP)	Yes	Yes
24				No	No
25				No	Yes
26				OECD	1971-2002
27	1972-2002	Yes	Yes		
28	1971-2002	No	No		
29	1972-2002	No	Yes		
30	WEO	1981-2002	GDP per capita based on PPP valuation ⁸	Yes	No
31		1982-2002		Yes	Yes
32		1981-2002		No	No
33		1982-2002		No	Yes

⁷ http://www.oecd.org/document/28/0,2340,en_2825_495684_2750044_1_1_1_1,00.html, Comparative Table B

⁸ <http://www.imf.org/external/pubs/ft/weo/2003/02/data/index.htm>. The WEO database maintains neither PPP GDP per capita nor population series. We compute per capita GDP from GDP based on PPP valuation divided by implicit population (GDP current prices in national currency divided by GDP per capita current prices in national currency.)

References

Easterly, W., Fiess, N., and Lederman, D. NAFTA and Convergence in North America: High Expectations, Big Events, Little Time. *Economia*, 4(1) 2003.

Heston, A. and Summers, R. The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988
(v.5.6: <http://datacentre2.chass.utoronto.ca/pwt56/>)

Heston, A., Summers, R., and Aten, B. Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.
(<http://pwt.econ.upenn.edu/>)

International Monetary Fund. World Economic Outlook Database. September 2003
(<http://www.imf.org/external/pubs/ft/weo/2003/02/data/index.htm>)

Lederman, D., Maloney, W., and Serven, L. Lessons From NAFTA for Latin America and the Caribbean Countries: A Summary of Research Findings. (Advance Edition) 2004. Washington, D.C.: World Bank.

OECD. Annual National Accounts for OECD Member Countries.
(http://www.oecd.org/document/28/0,2340,en_2825_495684_2750044_1_1_1_1,00.html)