

KEYWORDS

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Latin America: highlights from the implementation of the System of National Accounts 1993

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This paper reviews the Latin American experience with the implementation of the 1993 System of National Accounts and the updating of the national accounts' base year. It also makes a preliminary assessment of the possible measurement biases in nominal GDP estimates stemming from the use of outdated national accounts base years, downward biases in household final consumption estimates, and an overestimation of gross fixed capital formation in construction activities.

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I

Introduction

Evidence-based policy design and execution has become a key topic of discussion in international forums in recent years. There is broad consensus about the consequences (in terms of economic and financial costs) that tend to arise when policymakers either do not have reliable evidence on which to base and assess the outcomes of their decisions or do not take full advantage of the available data when making policy. For all countries, evidence-based economic policy design helps identify factors and/or sectors of production where they may have comparative advantages in a globalizing world economy.

The search for more and better evidence about how national economies work has brought to the fore the need to produce reliable national accounts statistics, particularly for the production and income accounts. The best known indicator is Gross Domestic Product (GDP), which is the key metric in the statistical system for measuring countries' economic performance. For Latin America, the recent emphasis on evidence-based policymaking has coincided with a period of high growth and macroeconomic stability. This has given scope within fiscal budgets to support multi-year programmes aimed at significantly improving the national accounts. These statistical development programmes have produced consistent annual and

quarterly national accounts data that incorporate best international statistical practices—as recommended in the United Nations' *System of National Accounts* (henceforth the 1993 SNA)—and which are now regularly used for policymaking and economic debate.

This paper reviews the evidence from the recent revisions made to national accounts series in Latin America in the context of the implementation of the 1993 SNA and the governments' efforts to produce more comprehensive and robust national accounts. Section II provides background on the implementation of the 1993 SNA in Latin America, while emphasizing the evidence for those countries that have simultaneously implemented the 1993 SNA and changed the base year of their national accounts. Section III elaborates on the countries' gains from the compilation of new national accounts in terms of: (i) convergence towards best international accounting practices and (ii) the measurement of key macroeconomic aggregates and economic indicators. Section IV looks forward. It reviews the remaining source data limitations facing 33 countries in the Latin American and the Caribbean region and develops a preliminary estimate of the possible estimation bias contained in current GDP estimates. Section V sums up the main findings of the cross-country analysis.

II

Background

Since the 1940s, countries in Latin America have been engaged in compiling integrated systems of national accounts consistent with the methodological manuals produced by the United Nations. Economic diagnosis and policy design in the region has focused on key macroeconomic variables such as GDP, total final consumption, investment (gross capital formation)

and saving aggregates. These national accounts aggregates have become critical indicators of policy effectiveness as countries implemented a variety of economic development programmes to raise living standards and address poverty.

Best practices on the compilation of national accounts have changed over the years to respond to the transformation of the world economy. An extensive expert consultation process during the 1980s led to the revision of the 1968 *System of National Accounts* manual (1968 SNA) and the issuing of the 1993 SNA manual. The voluminous 1993 SNA manual sought to

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add conceptual and methodological clarity to the earlier manual, while pursuing leadership and harmonization with statistical manuals in the areas of government finance, monetary and financial statistics and balance of payments. On the latter, the publication of the *Fifth Edition of the Balance of Payments Manual* (BPM5) by the International Monetary Fund (IMF) in 1993 was an important complement to the methodological work on national accounts by the Inter-Secretariat Working Group on National Accounts (United Nations, IMF, the Organisation for Economic Co-operation and Development, the Statistical Office of the European Communities and the World Bank).

For the countries, the task from 1993 onwards has been to design and implement working plans to upgrade their national accounts and balance-of-payments statistics in line with the recommendations of the 1993 *SNA* manual and BPM5, respectively. To date, as many as 23 (out of a total of 33) countries in Latin America and the Caribbean have, to various degrees, implemented these methodological guidelines. A narrower set of countries has not only implemented the system's guidelines, but also changed the base year for their national accounts (see box 1).

The financial and human resources allocated to the production of the new national accounts statistics have been substantial and have included multi-year efforts by a number of public and private institutions—including technical and financial support from bilateral and international financial institutions. On average, it has taken about five or six years for the

country authorities to complete a national accounts revision project and issue new time series. IMF has contributed to this work by fielding technical assistance and multisector missions and by providing training and making assessments of macroeconomic statistics under the Data Module of the Report on the Observance of Standards and Codes (data ROSC). The data ROSC have been structured according to the IMF Data Quality Assessment Framework (DQAF), which covers six data quality dimensions: (i) prerequisites of data quality, including the legal and institutional environment and resources that are commensurate with the needs of statistical programs; (ii) assurances of integrity, including professionalism, transparency and ethical standards regarding statistical data; (iii) methodological soundness, including data concepts and definitions, scope, classification/sectorization and basis for recording; (iv) accuracy and reliability, including source data, assessment of source data, statistical techniques, assessment and validation of intermediate data and statistical outputs and revision studies; (v) serviceability, including periodicity and timeliness in data publication, consistency, revision policy and practice; and (vi) accessibility, including data and metadata accessibility and assistance to data users.

Overall, the data ROSC, by comprehensively assessing the economic statistical system, have reportedly invigorated the country authorities' efforts and responsibility to promote and pay special attention to this complex multi-year data collection exercise. Other leading technical agencies of the United

Box 1

CHANGING THE BASE YEAR: WHAT DOES IT IMPLY?

In many Latin American countries, the core of the national accounts is the size and composition of GDP calculated from the production approach. GDP of the various activities and sectors of the economy is commonly calculated on the basis of censuses, administrative records and surveys. Regularly conducting a comprehensive census of all registered companies and establishments would allow the authorities to keep good track of changes in the size and structure of the economy. However, because of the high cost and complexity of the exercise, comprehensive censuses are only carried out for certain "base years." The results of annual surveys completed for a representative sample of enterprises and establishments are used to compile the national accounts for the following years.

Base year estimates tend to become obsolete with the passage of time. The appearance of new economic activities and the disappearance of others, due in part to technological and institutional developments, lead to changes in values and relative prices of goods and services. Updating the base year thus becomes imperative. This includes revising the coverage, structure and relative prices of national accounts. The 1993 *SNA* manual recommends updating the base year every five years.

Nations, such as ECLAC, have hosted active forums for discussion, training and monitoring of the 1993 SNA implementation programme in the region.

Countries in the region have undertaken work in two main areas since 1993. First, they have used more comprehensive and robust source data for compiling new national accounts' base years. This included, *inter alia*, launching new household income and expenditure surveys, updating businesses registries and developing relevant price indices for assessing national accounts in volume terms. Second, there have been changes or improvements in the national accounts' compilation methodology following the 1993 SNA recommendations and technical advice stemming from IMF technical assistance and multisector missions, as well as the data ROSC.¹ According to the evidence, the combined implementation of changes in the national accounts' base year and the 1993 SNA statistical methodologies (which includes 16 country cases to date; see box 2) has generally resulted in increases in nominal GDP

levels (for the base year assessed under the old and new methodology) with a median increase of 8.8% (in other words, an average 6.5% increase on a GDP-weighted basis).² Reductions in nominal GDP levels from the simultaneous implementation of the 1993 SNA and the rebasing of the national accounts happened in less than 31% of cases (5 country cases out of a total of 16 cases).

In all cases, analysts and policymakers have welcomed the incorporation of new source data and the updating of the base years, as the old national accounts and their corresponding base years—which usually dated from the 1980s or were some 15 years old—were considered too outdated to adequately capture the changes in sectoral values of production, volumes and prices that had taken place in the domestic economy. The revised national accounts data have also strengthened the production of robust high-frequency economic indicators, such as the production, price and employment series.

III

Updating National Accounts in Latin America: A Preliminary Assessment

This section elaborates on the main results achieved by updating the national accounts' base year and implementing the 1993 SNA in Latin American countries. It stresses the gains achieved in terms of applying best international accounting practices and discusses the implications of these data revisions for economic analysis. Regarding the latter, it assesses the impact of the national accounts revisions on nominal GDP levels, real GDP growth rates and the composition of GDP in the production, expenditure and income approaches. The section concludes with an overview of the remaining data puzzles, which include a reported coexistence of higher economic growth and an important reduction in total consumption as a share of GDP in the majority of the countries that

revised their national accounts estimates. Also, the ratios of gross capital formation and their implicit incremental capital output ratios (ICORs) have remained somewhat high by international standards (at an average value of 5.6), suggesting relatively low productivity of capital.³

¹ A detailed description of the main methodological changes between the 1968 SNA and the 1993 SNA can be found in Olinto Ramos, Pastor and Rivas (2008).

² The extreme case of Nicaragua's March 2003 revision of the national accounts, which raised the level of nominal GDP of 2000 by 70%, is excluded from this calculation. Revisions to the national accounts statistics addressed major deficiencies in the coverage of economic activities and an outdated base year.

³ The incremental Capital-Output Ratio (ICOR) is the ratio of the ratio of investment in nominal GDP to the economy's real growth rate. In the standard Harrod-Domar economic growth model, the ICOR is equal to 1 divided by the marginal productivity of capital. The higher the ICOR is, the lower the productivity of capital. The ICOR can be thought of as a measure of the inefficiency with which capital is used. In most industrialized countries the ICOR is in the neighborhood of 3-3.5. The World Bank Statistical Manual (available on the Internet, as well as Wikipedia, the Free Encyclopedia (http://en.wikipedia.org/wiki/Incremental_Capital-Output_Ratio)) provides a basic description of the ICOR concept.

Box 2
LATIN AMERICA: IMPACT ON NOMINAL GDP LEVELS OF CHANGES IN THE BASE YEAR
AND THE IMPLEMENTATION OF THE 1993 SNA

	Base Year		Level difference in nominal GDP vs. old base year GDP (Percentages)
	Old	New	
A. Countries that changed their base year and implemented the 1993 SNA			
Argentina	1986	1993	-8.2
Brazil	1985	2000	7.0
Chile	1986	1996	9.9
Chile	1996	2003	0.2
Colombia	1975	1994	16.5
Colombia	1994	2000	12.0
Ecuador	1975	1993	-3.1
Ecuador ^a	1993	2000	16.7
Guatemala	1958	2001	-10.7
Honduras	1978	2000	19.2
Mexico	1980	1993	9.7
Mexico	1993	2003	9.6
Nicaragua	1980	1994	70.0
Paraguay	1982	1994	-11.6
Uruguay	1983	1997	8.8
Venezuela (Bolivarian Republic of)	1984	1997	-3.2
Memo items:			
Average, all countries excluding Nicaragua			4.9
Weighted average, all countries excluding Nicaragua ^b			6.5
Median, all countries excluding Nicaragua			8.8
B. Countries that changed their base year with impending full 1993 SNA implementation			
Bolivia (Plurinational State of)	1980	1990	-12.2
Costa Rica	1966	1991	28.0
El Salvador	1974	1990	-11.1
Guyana	1977	1988	-2.0
Jamaica	1974	1986	3.7
Panama	1970	1996	9.5
Peru	1979	1994	-10.7

Source: national authorities' official websites and IMF staff estimates.

^a National accounts in 2000 are in dollars; earlier estimates are in sucres.

^b Refers to the United States dollar GDP-weighted average of the changes in nominal GDP for the sample of countries. There are no GDP estimates available on a PPP basis for Central America, thus precluding an alternative analysis of the GDP changes.

1. Quality Gaps vis-à-vis Best Practices

As noted above, the IMF staff, in the context of the data ROSC conducted on the basis of the DQAF, has sought to identify strengths and weaknesses in six data quality dimensions (e.g., prerequisites of quality, assurances of integrity, methodological soundness, accuracy and reliability, serviceability and accessibility by users) for five data sets: national accounts, prices, balance of payments, government finance and monetary and financial statistics. To date, some 114 data ROSC (including updates) have been conducted by the IMF staff, including for 10 out of the 13 Latin American countries that have changed their national accounts base year along with the 1993 SNA implementation. The Data Module of the ROSC missions in Latin America has generally been carried out before or while the new national accounts were still under preparation, with the missions' results and recommendations supporting host countries' efforts to improve the quality of the national accounts statistics.

In assessing the relevance of these issues, the IMF staff has used as benchmarks the methodological recommendations included in the 1993 SNA, as well as information and practices from countries around the world in national accounts compilation. The latter, in particular, has allowed the staff to qualify whether an existing practice falls within or below the international standard. Activities have been ranked into four categories depending on whether: a practice is observed (O), meaning that the statistical routine meets international best practices; a practice is largely observed (LO); a practice is largely not observed (LNO); or a practice is not observed (NO) (see table 1).

The data quality assessments/ratings granted to Latin American countries can be further analysed by comparing them against those granted to the six G-8 countries that have participated in the Data Module of the ROSC. The following observations emerge from this comparative analysis (see table 2):

- Latin American countries lagged behind the G-8 countries in all 6 data quality dimensions assessed, although the gaps varied significantly across them.
- In terms of prerequisites of quality and assurances of integrity, the Latin American countries compared relatively well on account of strong and growing inter-institutional coordination among data producers and compilers. The ROSC assessments also suggest adequate emphasis by data producers regarding the production of

“quality” statistics, although a pending challenge refers to the allocation of commensurate resources to run the statistical programmes (i.e., problems obtaining adequate funding for staff training, physical capital upgrades, updating business directories, launching regular data collection surveys and censuses, the use of the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 3 and the Central Product Classification (CPC) for purposes of national accounts' compilation, and changing the national accounts' base year every five years, as recommended by the 1993 SNA).

- By contrast, data dimensions regarding accuracy and reliability and methodological soundness show the greatest need for improvement.
- Latin American countries show relatively poor source data as well as weaknesses in the statistical techniques employed and the assessment of intermediate data results. On statistical techniques, countries tend to use supply and use tables with outdated fixed technical coefficients and lack data revision policies to track data reliability over time. In this context, a recurrent recommendation from the data ROSC has been the need to implement more comprehensive source data collection programmes for rapidly-growing industries in the manufacturing and services sectors, as well as to improve estimates for the non-observed and informal sectors of the economy. The revision of fixed technical coefficients used in the countries' input-output tables has been another avenue for prospective data quality improvement.
- Metadata accessibility to users and assistance to data users are quality dimensions that also need further improvement in Latin American countries.

2. Economic dimensions of the data revisions

(a) Higher nominal and real GDP estimates

National accounts revisions in Latin American countries (excluding Nicaragua) have generally resulted in level-changes in nominal GDP values within a range of -8.2% to 19.2%, with an unweighted median increase of 8.8% compared with the old base year estimates.⁴ From the GDP expenditure approach, there were significant increases, albeit with variances across

⁴ The GDP-weighted average is 6.5% (see box 2).

TABLE I

Latin America and the Caribbean: Data ROSC: summary of results - national accounts

DQAF data quality dimensions	Plurinational State of Bolivia ^a	Chile ^{b,c}	Colombia ^b	Costa Rica ^a	Ecuador ^b	Guatemala ^b	El Salvador ^a	Honduras ^b	Mexico ^b	Nicaragua ^b	Panama ^b	Paraguay ^b	Peru ^a	Dominican Republic ^b
0. Prerequisites of quality														
0.1 Legal and institutional environment	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO
0.2 Resources	LO	O	LNO	O	LO	LNO	LO	LO	O	O	LO	LNO	LNO	LO
0.3 Relevance	LO	LO	LO	LO	O	LO	LO	LO	O	LO	O	LO	LO	LO
0.4 Other quality management	O	O	O	LO	O	LO	...	LO	O	LO	LO	O	LO	O
1. Assurances of integrity														
1.1 Professionalism	O	O	O	O	O	LO	O	O	O	O	O	O	O	O
1.2 Transparency	LO	O	O	LO	O	LO	LO	LO	O	O	LO	O	LNO	LO
1.3 Ethical standards	O	O	O	O	O	O	O	O	O	O	O	O	O	O
2. Methodological soundness														
2.1 Concepts and definitions	LO	O	O	O	O	LNO	LO	LNO	O	O	O	O	LO	O
2.2 Scope	LO	LO	LO	O	O	LNO	LNO	LO	O	O	O	LO	LO	O
2.3 Classification/sectorization	LO	LO	O	LO	LO	LNO	LNO	LNO	LO	O	O	LO	LO	LO
2.4 Basis for recording	O	LO	O	O	LO	LO	LO	LO	O	LO	LO	LO	LO	O
3. Accuracy and reliability														
3.1 Source data	LNO	LO	LO	LNO	LO	LNO	LNO	LO	LO	LO	LO	LO	LNO	LNO
3.2 Assessment of source data	LO	LO	O	O	O	LNO	LNO	LO	O	O	LO	O	LNO	LO
3.3 Statistical techniques	LNO	LO	LO	LNO	O	LNO	LO	LNO	LNO	LO	LNO	LNO	LNO	LNO
3.4 Assessment and validation of intermediate data and statistical outputs	O	LO	LO	LO	O	LNO	O	LO	LO	O	LO	O	LO	O
3.5 Revision studies	LO	O	NO	LNO	LO	LNO	LO	LNO	LO	LNO	LNO	LO	LO	LNO
4. Serviceability														
4.1 Periodicity and timeliness	O	O	LO	O	O	O	O	O	O	O	O	LO	LO	O
4.2 Consistency	LO	O	O	LO	O	LNO	LO	LO	O	O	LO	LO	LO	LO
4.3 Revision policy and practice	LO	O	LO	LO	LO	LNO	LO	LO	O	LO	LO	LO	LO	LO
5. Accessibility														
5.1 Data accessibility	LO	LO	O	O	O	LO	O	LNO	O	LO	LO	LO	O	LO
5.2 Metadata accessibility	O	O	O	LNO	LO	LNO	LO	LNO	O	LO	O	LO	LO	LNO
5.3 Assistance to users	O	O	O	LO	O	LO	LO	LO	O	O	LO	LO	O	LO

Source: data ROSC reports, [online] www.imf.org.

Note: O = Observed, LO = Largely observed, LNO = Largely not observed, NO = Not observed.

^a Refers to countries that undertook and published a Data Module of the ROSC, but either did not change their base year and/or implement the 1993 SNA.

^b Refers to countries that have implemented the 1993 SNA, along with a change in their national accounts' base year, and published the Data ROSC.

^c Data ROSC update conducted in April/May 2007.

TABLE 2

G-8 Countries: Data ROSC: summary of results - national accounts

DQAF data quality dimensions	Canada	Germany	Japan	Italy	France	Russian Federation
0. Prerequisites of quality						
0.1 Legal and institutional environment	O	O	O	O	O	LNO
0.2 Resources	O	O	LNO	LO	LO	LNO
0.3 Relevance	O	O	O	O	O	LO
0.4 Other quality management	O	O	O	O	O	O
1. Assurances of integrity						
1.1 Professionalism	O	O	O	O	O	O
1.2 Transparency	O	O	O	O	O	O
1.3 Ethical standards	O	O	O	O	O	O
2. Methodological soundness						
2.1 Concepts and definitions	O	O	O	O	O	O
2.2 Scope	O	O	O	O	O	O
2.3 Classification/sectorization	O	O	O	O	O	LNO
2.4 Basis for recording	LO	O	O	O	O	O
3. Accuracy and reliability						
3.1 Source data	O	LO	LO	O	O	LO
3.2 Assessment of source data	O	O	LO	O	LO	LO
3.3 Statistical techniques	O	O	O	LO	O	O
3.4 Assessment and validation of intermediate data and statistical outputs	O	O	O	O	O	O
3.5 Revision studies	O	O	LNO	O	O	O
4. Serviceability						
4.1 Periodicity and timeliness	O	O	O	O	O	O
4.2 Consistency	O	O	O	O	O	O
4.3 Revision policy and practice	O	O	O	O	LO	O
5. Accessibility						
5.1 Data accessibility	O	O	O	O	O	LO
5.2 Metadata accessibility	O	O	O	O	O	LO
5.3 Assistance to users	O	O	O	O	O	O

Source: data ROSC reports, [online] www.imf.org.

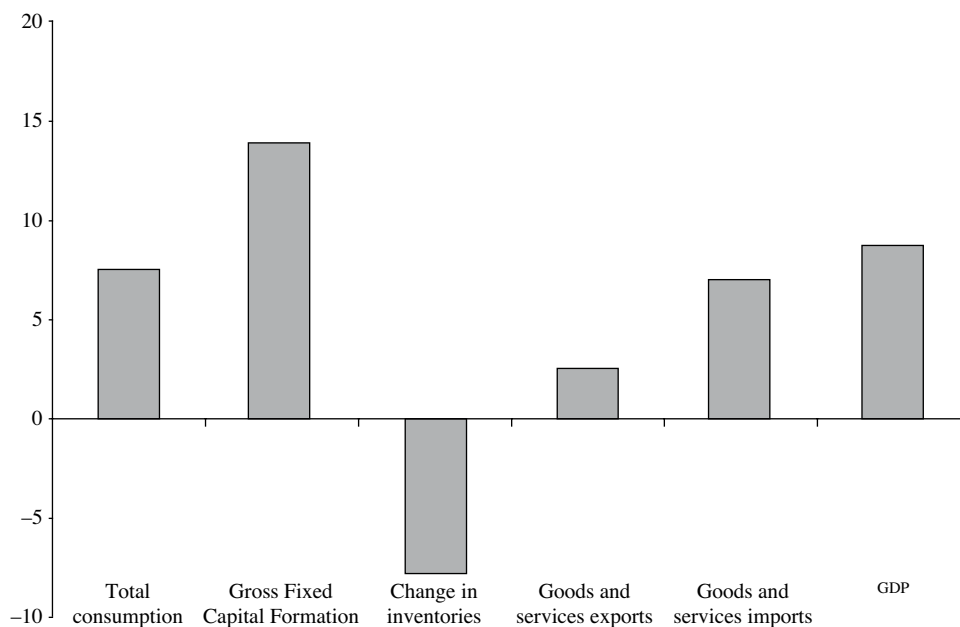
Note: O = Observed, LO = Largely observed, LNO = Largely not observed.

countries, in gross fixed capital formation, although total final consumption was also adjusted upwards in the context of the national accounts revisions. From the GDP production approach, there was a notable decline in the estimated value added of agriculture, hunting, forestry and fishing, while nominal value added estimates for other sectors, including, in particular, construction and services, were revised upwards (see figures 1 and 2). The resulting data revisions have led to changes in the ratios to GDP of economic variables, such as the fiscal deficit, the current account balance, external debt and tax revenues, which are widely used in financial programming and policy decision-making.

National accounts statistics revisions have also resulted in changes in per capita GDP ratios which, at times, resulted in reassessments of the relative ranking of countries within the region and of the administrative classifications of countries on the lists of Low-Income Member Countries and Heavily Indebted Poor Countries (HIPC). Real economic growth rates were also revised as a result of the updating of national accounts statistics, with real GDP growth rates being on average 0.2 percentage points higher than with the old national accounts base year, albeit with significant variations across countries (see table 3). On a real GDP per-capita basis, the revisions to the national

FIGURE 1

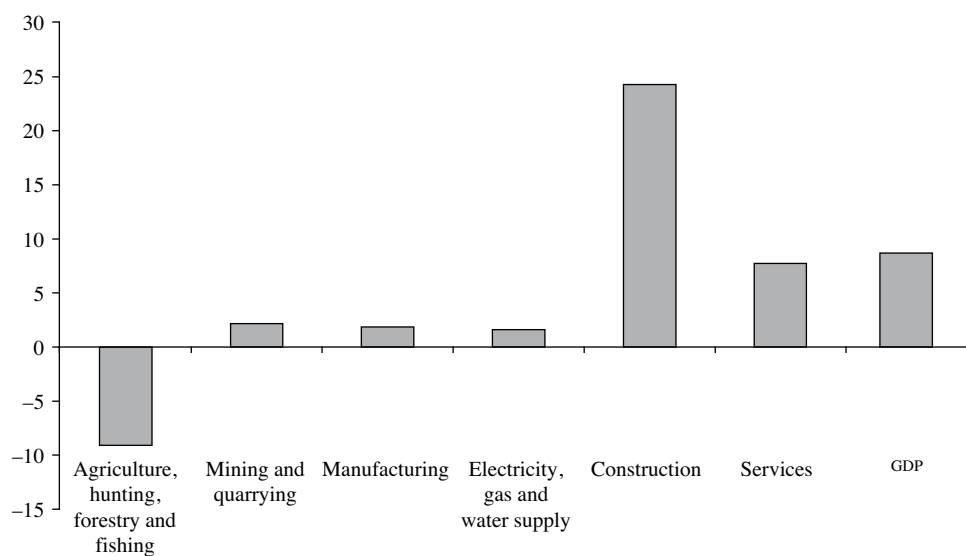
Median Changes in Base Year Nominal GDP Levels: Expenditure Approach
(Percentages)



Source: country authorities' official websites.

FIGURE 2

Median Changes in Base Year Nominal GDP Levels: Production Approach
(Percentages)



Source: country authorities' official websites.

TABLE 3

**Latin America: difference in real GDP growth rates under
new and old national accounts statistics^a**

	Base year		Increase in real GDP growth rates			Average increase in real GDP growth rates ^b	
	Old	New	T + 1	T + 2	T + 3	First 2 years	First 3 years
Argentina	1986	1993	-2.2	1.2	0.75	-0.5	-0.1
Brazil	1985	2000	0.0	0.8	0.6	0.4	0.5
Chile	1986	1996	-0.8	-0.7	0.3	-0.8	-0.4
Chile	1996	2003	-0.2	-0.6	...	-0.4	-0.4
Colombia	1975	1994	-0.6	...	...	-0.6	-0.6
Colombia	1994	2000	0.7	...	...	0.7	0.7
Ecuador	1993	2000	-0.3	-0.6	...	-0.5	-0.5
Guatemala	1958	2001	1.7	0.4	0.5	1.1	0.9
Honduras	1978	2000	0.1	0.9	1	0.5	0.7
Mexico	1980	1993	0.8	...	...	0.8	0.8
Mexico	1993	2003	-0.2	0.4	0.0	0.1	0.1
Nicaragua	1980	1994	1.6	1.5	-1.1	1.6	0.7
Paraguay	1982	1994	0.7	-0.9	0.4	-0.1	0.1
Uruguay ^c	1983	1997	-0.04	...	...	0.0	0.0
Venezuela (Bol. Rep. of)	1984	1997	0.4	...	...	0.4	0.4
Memorandum items:							
Average all countries ^b			0.1	0.2	0.3	0.2	0.2
Median all countries			0.0	0.4	0.5	0.1	0.1

Source: country authorities' official websites.

^a For the period after the new benchmark year (e.g. T + 3 refers to 3 years after the new base year). In general, countries produced national accounts with the old and new methodology for an overlapping period of three years.

^b Unweighted averages.

^c Data refer to 1997.

accounts statistics have generally emphasized a much better (or less negative) economic growth performance than previously assessed (see figure 3).

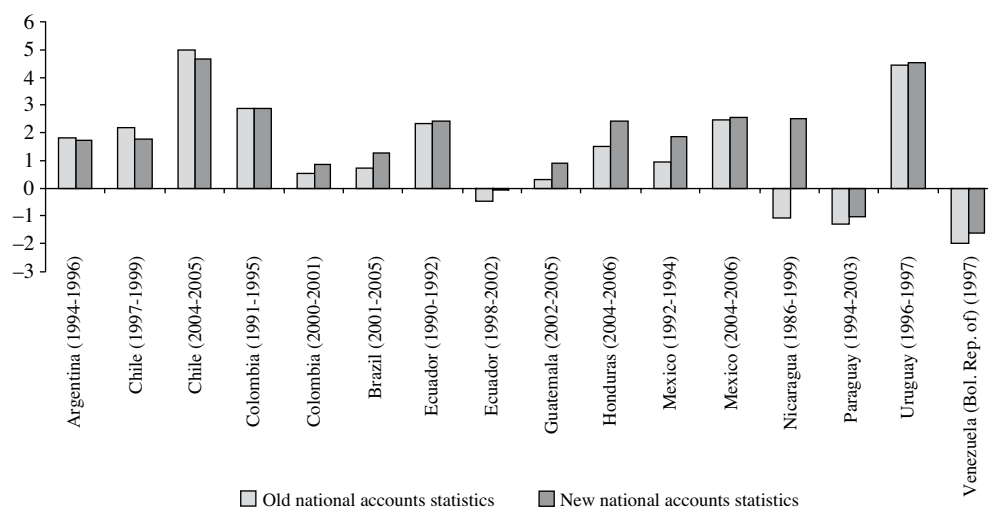
The gap between the price and quantity effect in GDP in the context of national accounts revisions hints at a number of pending challenges for compilers. As noted above, the sizeable changes in nominal GDP figures (in a range of -8.2% to 19.2%, excluding Nicaragua) mirror current-price data reclassifications in keeping with the 1993 SNA and significant improvements in source information stemming from more regular data collection surveys of key sectors in the economy. Yet the authors' view is that much remains to be done in terms of the development of robust volume and price indices—especially for output produced for own final use (see box 3), illegal and informal sector activities and the growing telecom, financial and other services sectors—that meet analytical/theoretical requirements and compensate for data limitations facing the national accounts compilers.

To date, for example, the 1993 SNA recommendation to compile supply and use tables at current and constant prices at the same time, and balanced simultaneously, is gradually being implemented among Latin American countries.⁵ Yet, as noted by Sake de Boer and others (1999), while the simultaneous balancing at current and constant prices has many advantages, an important weakness is the possible neglect of the difference between deflated data (derived by compilers using current price information and available price indices) and actually measured (independently collected) volume data. Best practice is to validate the deflated data of the supply and use table with independent estimated volume data.

⁵ Brazil, for example, has been a leader in the production of Supply and Use Tables at constant prices (i.e., at prices of the previous year) since the late 1990s.

FIGURE 3

Real per capita GDP growth rates under alternative National Accounts series
(Percentages)



Source: country authorities' official websites.

Another main methodological weakness in assessing volume growth of GDP series is the lack of new source data in a times series format. Revisions of national accounts statistics, including changes in the base year, often use new source data that are only available for the base year; i.e., countries base revisions on one-off censuses and surveys, which are not followed up with regular new statistical surveys. Although such revisions may improve the estimates of the levels of GDP in current prices, they are not likely to produce improved quarterly or annual volume growth estimates.

(b) *Changes in countries' recorded economic structures*

Revisions to the national accounts have also led to changes in the statistics on the countries' underlying economic structure (see table 4). On the one hand, in Central America, the share of agriculture and forestry, as well as that of services, in GDP declined, while the share of civil construction and manufacturing increased. The increase in the share of manufacturing reflects changes in the accounting of the activities of national and multinational companies operating in the Central American textile sector (maquila) in the context of free trade agreements with the United States. The declining share of services reflects mainly

the 1968 SNA (rather than 1993 SNA) accounting treatment of financial intermediation services indirectly measured (FISIM) in Honduras' new national accounts (allocated to intermediate consumption of a notional industry)⁶ and a reassessment of value added for trade, transportation and financial intermediation activities in Guatemala.

On the other hand, for the rest of the Latin American countries, and in line with international trends, an increase in the share of services—particularly modern services such as information and communication services, and informal services provided by unincorporated enterprises owned by households—has been accompanied by a simultaneous decline in the share of agriculture, hunting, forestry and fishery in total value added. A singular decline in the share of manufacturing value added for these countries largely reflects the expanded coverage and the reclassification of oil-related activities into a separate petroleum sector (included as part of mining and quarrying in table 4) for the Bolivarian Republic

⁶ FISIM is defined in the 1993 SNA as the total property income receivable by financial intermediaries minus their total interest payable, excluding any property income receivable from the investment of their own funds.

TABLE 4

Latin America: Changes in nominal GDP structure due to revisions in national accounts statistics
(Percentage points of GDP)

	Countries			
	All ^a	Central America ^b	All less Central America	Oil Producers ^c
Agriculture, hunting, forestry and fishing	-3.1	-4.6	-2.8	-1.9
Mining and quarrying ^d	0.8	-0.2	1.0	2.1
Manufacturing	-0.2	4.6	-1.2	-3.2
Electricity, gas and water supply	-0.3	-1.3	-0.1	0.6
Construction	0.6	2.1	0.3	1.1
Services	2.7	-0.5	3.3	1.4
Trade services, restaurant and hotel services	-1.4	-2.2	-1.3	-2.5
Transport, storage and commercial services	0.1	-1.1	0.4	0.2
Financial intermediation	-1.2	-1.7	-1.0	0.0
FISIM ^e	1.3	0.0	1.3	0.0
Other services ^f	5.0	5.6	3.9	0.7

Source: countries' national accounts statistics.

^a Includes Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay and Uruguay.

^b Includes Guatemala and Honduras. Increases in the share of manufacturing reflect the revised treatment of the maquila, with these companies' profits now included as part of value added and their exports as part of gross output. Declines in the share of trade services reflects a reclassification of accounts and the inclusion of owners' occupied rents in Guatemala's revised national accounts.

^c Includes the Bolivarian Republic of Venezuela, Ecuador and Mexico.

^d Includes oil extraction.

^e Reflects revised statistical treatment of FISIM under SNA93, which allocates FISIM as intermediate consumption of the various institutional sectors.

^f Includes value added from imputed rental of owner-occupied housing, public administration, defence, social security, health and education services.

of Venezuela. If Ecuador, Mexico and the Bolivarian Republic of Venezuela are not taken into consideration, the share of manufacturing in total GDP increases for the sample of countries.

(c) *Changes in income distribution*

The revisions to national accounts statistics resulted also in new estimates of income distribution in Latin America. In general, compared to the old base year, the revised national accounts statistics show a reduced share of "compensation to employees" in the calculation of the GDP by the income side (see figure 4). The reduced share of GDP accruing to employees reflects, in part, the way the 1993 SNA broadens income measures for households to include a new concept, called "mixed income," so as to record the income perceived by owners for their work in an unincorporated enterprise and their earnings as entrepreneurs. Over time, the decline in the income share accruing to employees compares with a somewhat gradual increase in the share of the operating surplus and mixed income, especially as we

move away from the new national accounts' base year.⁷ This trend may reflect, in part, the countries' rapidly changing underlying economic structure and relative prices, which tend to diminish the representativeness of the base year over time. It is in this regard that the 1993 SNA recommends a revision of the national accounts base year every five years, if possible.

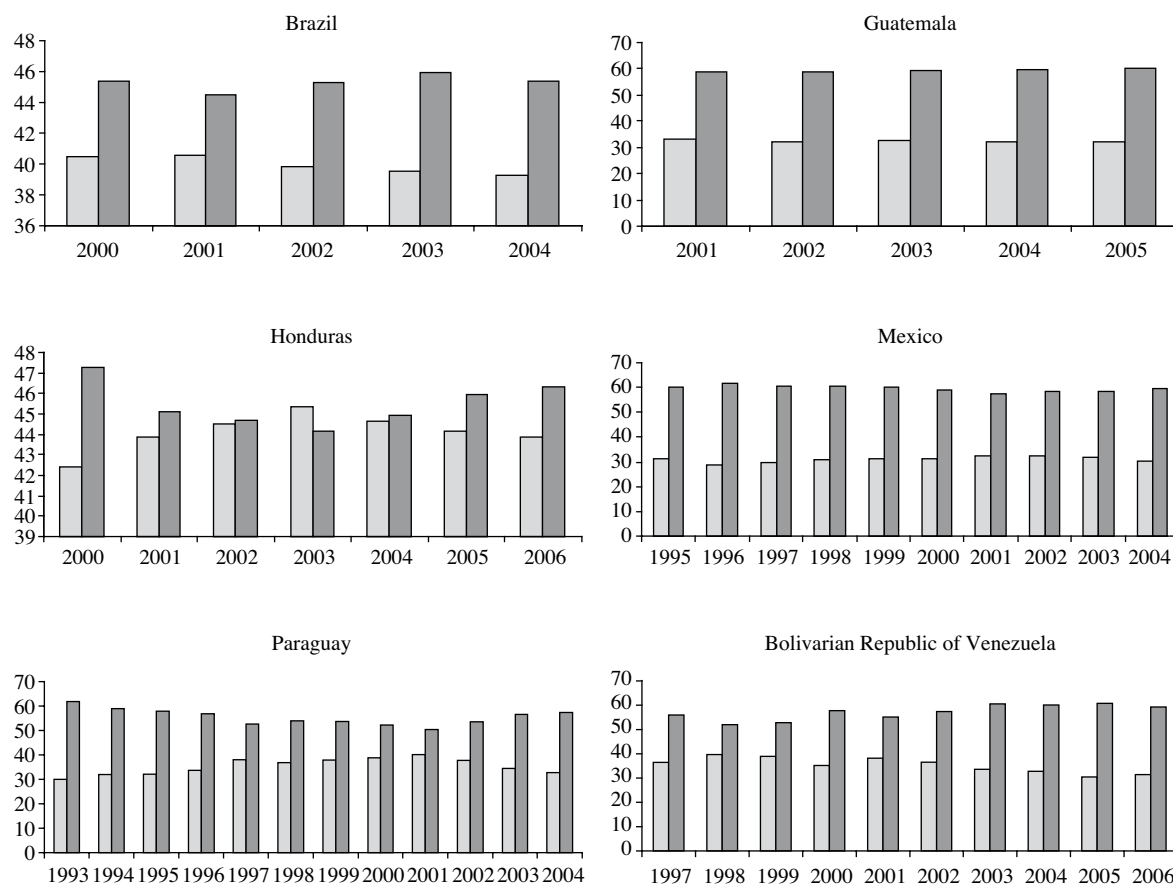
3. Remaining Data Puzzles

As noted above, an important analytical tool recommended by the 1993 SNA is the development of supply and use tables to secure the basic balance between supply and demand of production by checking the consistency of estimates and filling data gaps. At the same time, Latin American statistical agencies have been moving away from indirect estimates of key

⁷ The remaining income share accrues to taxes on production and imports.

FIGURE 4

Selected countries: Share of compensation to employees and mixed income plus operating surplus in nominal GDP
(Percentages)



Source: country authorities' official websites.

^a Left-hand side bar is compensation to employees. Right-hand side bar is mixed income plus operating surplus.

source national accounts data (that include mainly volume and price extrapolations from base years) to the use of direct sampling processes founded on regular household consumption surveys and surveys of main industries. Information from these surveys is usually scrutinized by applying supply and use tables at the detailed product level for the various institutional sectors (households, businesses and government) and using intermediate indicators and/or data validation routines, such as standard ratios of household consumption spending by income thresholds, as well as information derived from income tax and other tax declarations by enterprises, when assessing overall

production and uses (e.g., consumption, gross fixed capital formation, net exports) levels and trends.

(a) *Lower consumption/GDP ratios*

Despite the aforementioned methodological advances, a notable feature contained in the national accounts data revisions is that the new GDP series, including their upward revisions in real GDP growth rates, has coincided with a decline in the unweighted average share of total consumption in nominal GDP (see table 5). Relatively large countries like Brazil (base year 2000), Mexico (base year 1993) and Colombia (base year 2000) —with rather good source data

TABLE 5

Latin America: Changes in the composition of aggregate demand under new national accounts statistics^a
(Percentage points of GDP)

	Base year		Impact of revision on GDP shares over time					ICOR ^b	
	Old	New	Consumption	GFKF	Change in inventories	Gross capital Formation ^c	Trade balance	Old data	New data
Brazil	1985	2000	4.3	-2.8	-1.0	-3.8	-0.6	9.6	6.1
Chile	1986	1996	-0.7	1.2	-0.9	0.2	0.5	5.0	6.1
Chile	1996	2003	0.8	-1.2	0.4	-0.9	0.1	4.3	3.4
Colombia	1975	1994	-0.4	3.1	-0.1	2.9	-2.5	3.5	4.6
Colombia	1994	2000	1.5	0.5	1.6	2.1	-3.7	4.6	5.5
Ecuador	1993	2000	1.5	0.3	1.5	1.8	-3.2	6.5	6.7
Guatemala	1958	2001	0.3	3.6	-2.3	1.3	-1.6	5.3	5.5
Honduras	1978	2000	-4.9	0.0	2.4	2.4	2.4	7.0	4.7
Mexico	1980	1993	1.6	-1.3	-0.6	-1.9	-0.2	7.3	6.9
Mexico	1993	2003	-2.8	0.3	2.4	2.7	0.1	5.3	5.2
Nicaragua	1980	1994	-15.1	-3.7	2.9	-0.8	17.6	6.0	6.7
Paraguay	1982	1994	-5.3	-1.1	1.9	0.8	4.4	7.1	5.8
Uruguay	1983	1997	-2.7	2.3	0.2	2.6	-0.1	2.3	2.7
Venezuela (Bol. Rep. of)	1984	1997	-8.0	8.1	0.0	8.1	-0.1	2.0	1.6
Memorandum items:									
Average all countries			-2.1	0.7	0.6	1.3	0.9	5.4	5.1
Median all countries			-0.6	0.3	0.3	1.5	-0.1	5.3	5.5
Average all countries excluding Nicaragua			-1.1	1.0	0.4	1.4	-0.3	5.4	5.0
Median all countries excluding Nicaragua			-0.4	0.3	0.2	1.8	-0.1	5.3	5.5

Source: national authorities' official websites.

^a Data for Argentina are not presented in this table as changes in inventories are included in final consumption in the official Argentine data.

^b Incremental Capital Output Ratio (ICOR) is defined as the ratio of (GFKF/GDP) to the real GDP growth rate. Where GFKF is gross fixed capital formation and GDP is nominal GDP.

^c Defined to include GFKF plus change in inventories.

according to the assessments under the data ROSC—show a positive correlation between higher nominal GDP values, stronger economic growth and a rising share of total consumption in GDP in the context of national accounts revisions.

Brazil's increase in the ratio of final consumption/GDP, in the context of the recent re-basing of its national accounts, confirmed earlier econometric analysis that pointed to a possible underestimation of the growth rate of households' real income, although the data revisions reflected data coverage issues (i.e., activities carried out by unincorporated household enterprises and self-employed workers) rather than problems with the measurement of inflation as it had been assumed by the econometricians.⁸ Brazil's revisions

in its consumption data reflected the implementation of the 1993 SNA methodological recommendations and the availability of better source data, including a new household budget survey (implemented between July 2002 and June 2003) that was used for updating the representative family consumption basket and a survey on the urban informal sector used for including informal activities in production estimates.

correlation between households' real income and the share of food expenditure in the households' consumption basket. The authors assume, a priori, that nominal income in Brazil's national accounts is measured accurately. Accordingly, they postulate that any difference between the real income growth consistent with the estimated Engel curves and the real income growth derived from Brazil's national accounts reflects an overestimation of domestic inflation. In the event, the Brazilian authorities revised the original national income series from 2000–2005, while keeping the inflation estimates unchanged for the period. The CPI consumption basket was, however, updated using the latest household survey.

⁸ See Carvalho Filho and Chamon (2006) who use household survey data for Brazil to estimate Engel curves capturing the statistical

According to the revised national accounts (published in May 2007), Brazil's household final consumption expenditure in volume terms had been around 1.25% per year higher than assessed earlier (see figure 5). This underestimation of household consumption expenditure in the old national accounts statistics is roughly consistent with the gap of between 0.06% and 2.91% per year estimated by Carvalho Filho and Chamon (2006) when comparing per capita real income growth (derived using empirical/econometric Engel curves) and "headline" real household income growth (obtained by deflating nominal per capita household income by the consumer price index).⁹ The factors reconciling these two numbers are: (i) the required adjustments to the household survey data (which cover mainly out-of-pocket expenditure) to put these data on a conceptual basis similar to that of the national accounts (see box 3), and (ii) a working assumption that the correction to real household expenditure identified by Carvalho Filho and Chamon

(2006) applies only to out-of-pocket expenditure which is estimated at 40% of household final consumption expenditure in the national accounts.¹⁰

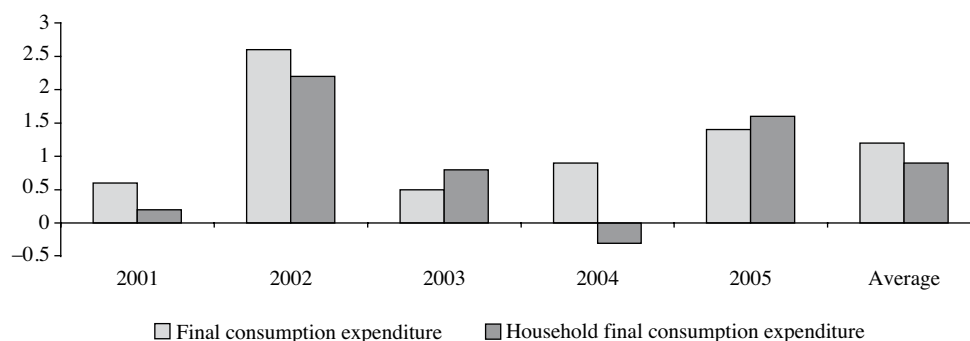
Besides Carvalho, Filho, and Chamon (2006), the analytical work by Lebow and Rudd (2003) and Deaton (2005) also points at methodological areas that may add to a possible estimation error of final consumption expenditure in the national accounts. These authors refer to the difficult-to-measure concepts of owners' equivalent rent (i.e., imputed rent of owner-occupied housing) and FISIM, in addition to the final consumption expenditure by non-profit institutions serving households (NPISH). In the case of Latin America and the Caribbean only 10 out of 33 countries calculate owners' equivalent rent as part of their national accounts' definition of household final consumption expenditure; FISIM is imputed only as part of household consumption for an even smaller group of countries in the region. Correcting final consumption and nominal GDP figures for

⁹ The authors' estimated gap of 0.06% per year applies to expenditure data covering tenants' rents only. The gap of 2.91% applies to expenditure data that include tenants' rents and the rental equivalent value of owner-occupied housing.

¹⁰ The weighted average of household consumption expenditure bias would be: the upper bound $(0.4) \cdot (2.91) + (0.6) \cdot 1 = 1.716$; the lower bound: $(0.4) \cdot (0.06) + (0.6) \cdot 1 = 0.624$. The mid-point would be 1.194, which is around Brazil's 1% increase in the national accounts' consumption levels in volume terms.

FIGURE 5

Brazil: Changes in real consumption growth rates resulting from comparing old and new national accounts statistics
(Percentage points)



Source: country authorities' official websites.

Box 3

RECONCILIATION OF DATA ON HOUSEHOLD FINAL CONSUMPTION EXPENDITURE
IN HOUSEHOLD SURVEYS AND NATIONAL ACCOUNTS

A number of adjustments are made to construct national accounts data on household final consumption that are consistent with data from household budget surveys. Most importantly, the survey data covers mainly out-of-pocket expenditure by households, whereas the national accounts data have considerably broader scope, representing all goods and services purchased by individuals and non-profit institutions that serve them.

For example, the national accounts data include all expenditures on medical care whether paid by households, employers or governments, whereas the survey data only cover the portion of expenditures paid by households out of their own pockets. In the United States, roughly one quarter of the personal consumption expenditure bundle in the national accounts is outside the scope of the household budget survey data.¹¹

The most common adjustments made to household survey data for national accounts compilation purposes are the following:

Goods. Include food produced and consumed on farms and food furnished to employees (including military), fuel produced and consumed on farms, and apparel provided to military personnel. Exclude monetary and in-kind transfers among households (to avoid double counting within the household institutional sector). Exclude taxes on products.

Medical care. Add government transfers to persons for medical care, employer contributions for employees' health insurance and workers' compensation. Adjust medical care plans to include both the plan's premium paid by affiliates and the expenses incurred by the plans on the provision of medical care. Only the insurance service should be included in consumption expenditure; that is, premiums minus claims plus premium supplements.

Education services. Include foundations and non-profit research organizations.

Other services. Include owners' equivalent rent (i.e., imputed rental of owner-occupied housing), rental value of farm housing, domestic services provided to families, imputed financial service charges and expenses for handling life insurance.

these amounts should be an important step towards improving the calculation of the consumption level of households in line with 1993 SNA methodology.

A further downward estimation bias in a number of countries in Latin America and the Caribbean arises from estimating household consumption as a residual by using the commodity flow method. As noted by Deaton (2005), there are many opportunities for errors along this chain of calculations, with the added complication of assessing intermediate consumption using technical coefficients from outdated input-output tables.

(b) *Higher gross fixed capital formation/GDP and incremental capital output ratios*

National accounts data revisions have produced higher ratios of gross fixed capital formation to GDP than under the old series. This has been the result of better source data being available to the national accounts compilers and methodological changes in the definition of gross capital formation (for example, expenses in mineral exploration activities and military expenses are now included in specific fixed assets). While higher gross fixed capital formation ratios should be good for growth over the long run, a remaining puzzle is the rather high incremental capital output ratios (ICORs) for the sample countries. Indeed, in the context of the data revisions, the average ICOR has

¹¹ See Lebow and Rudd (2003).

declined marginally from 5.4 to 5.0, on average, for all countries excluding Nicaragua (see table 5), but remain significantly above the international norm of between 3 and 3.5. Converging to the international norm is thought to secure faster economic growth and/or an efficient use of capital.

A review of the data ROSC conducted for countries in the region, as well as of the data sources and analyses performed by ECLAC (2007) and by international experts (Easterly and Kraay (2000) and Winters and Martins (2004)), points to a number of factors that may help explain the recorded average levels of gross fixed capital formation (and ICORs) in Latin America and the Caribbean:

- **Source data on gross fixed capital formation in construction activities have serious limitations.** The review of the evidence indicates that gross fixed capital formation in construction (representing about 50%-55% of gross capital formation across countries) is subject to statistical estimation errors that are more pronounced than for machinery and equipment. Statistical agencies tend to lack either direct sampling techniques for construction activities and/or access to tax records of the various institutional sectors (households and corporations) from which to derive robust estimates of these types of expenditures. For example, data and methodological weaknesses stressed in the Data Module of the ROSC for Peru (dated October 2003), refer to limited source data on private-sector construction activities and the lack of robust sample frameworks that could be used to assess the coverage of the sample and determine reliable grossing up factors for estimating aggregates for total construction activity. In Peru, construction is mainly estimated on the basis of cement production.
- **By contrast, estimates of gross fixed capital formation in machinery and equipment have tended to be more robust,** largely reflecting a very high correlation of these data with those of imports of capital goods used in the compilation of balance of payments statistics. The consistency of the balance-of-payments statistics with the national accounts is a data quality dimension assessed in the Data Module of the ROSC; the consistency between these two data frameworks has been confirmed by the data ROSC conducted in Latin America.
- **Investment to GDP ratios are substantially higher in small countries (with populations of less than**

a million people like the Caribbean countries) than larger countries (see table 6). This is an international cross-country regularity that holds independently on whether or not the national accounts statistics are measured along the 1968 SNA or 1993 SNA methodological guidelines.¹² The data for Latin America and the Caribbean confirm this regularity, with the larger countries in the region showing some convergence towards international ICOR levels of between 3 and 3.5.

(c) *Estimation issues with changes in inventories*

The value of changes in inventories, which is equivalent to a high of 3.5 to 7.0 percentage points of GDP in some countries in the LAC region (depending if we use an average or peak value of the series (see figures 6 to 9)) increased as a share of GDP in the context of the recent national accounts revisions. This regularity is at odds with the worldwide trend towards economizing on inventories in the context of improved inventory management. In general, there seems to be an overestimation of this variable for some countries as the sum of total changes in inventories and total private final consumption expenditures (including final consumption expenditures of non-profit institutions serving households) is usually assessed as a residual between the GDP calculated by the production approach and the sum of the other components of domestic expenditure and the trade balance. Estimates on household final consumption expenditures and changes in inventories are often separated by using population and wages data and the CPI developments—a method that departs from best practices. Other factors affecting the calculation of changes in inventories include country-specific accounting (or lack of accounting) of work in progress (such as growing crops, standing timber, stocks of fish and large construction projects), which should be recorded as inventories according to the 1993 SNA. Furthermore, for some countries, the reported steady increase of changes in inventories for several consecutive years warrants some caution as it would seem unduly costly for enterprises to operate in such a manner.

¹² See Easterly and Kraay (2000) for a comparison of macroeconomic data and performance in small States and larger ones around the world.

TABLE 6

Latin America and the Caribbean: Gross fixed capital formation ratios to GDP and alternative ICOR estimates, 1995-2005
(Percentages)

	1995	2000	2002	2003	2004	2005	Average ICOR 2003-2005
I. Latin America and the Caribbean (all countries)							
Gross fixed capital formation/GDP ratio	23.8	25.2	22.3	23.0	23.7	22.9	
ICOR (a) ^a	5.0	7.6	8.5	8.4	5.4	5.1	6.3
ICOR (b) ^b	4.3	9.9	7.4	5.2	5.5	5.3	5.3
II. The Caribbean^c							
Gross fixed capital formation/GDP ratio	28.7	31.5	27.6	29.3	30.2	27.6	
ICOR (a) ^a	9.5	13.1	9.5	11.5	7.4	6.4	8.4
ICOR (b) ^b	6.1	11.4	9.3	7.0	7.3	7.3	7.2
III. Latin America^d							
Gross fixed capital formation/GDP ratio	19.6	19.6	17.7	17.5	18.3	19.0	
ICOR (a) ^a	3.0	3.1	7.5	5.7	3.7	4.1	4.5
ICOR (b) ^b	2.8	8.6	5.7	3.6	4.0	3.7	3.7

Source: ECLAC database and authors' estimates.

^a ICOR (a) is defined as the GFKF/GDP ratio (year t) divided by the annual real GDP growth rates (year t).

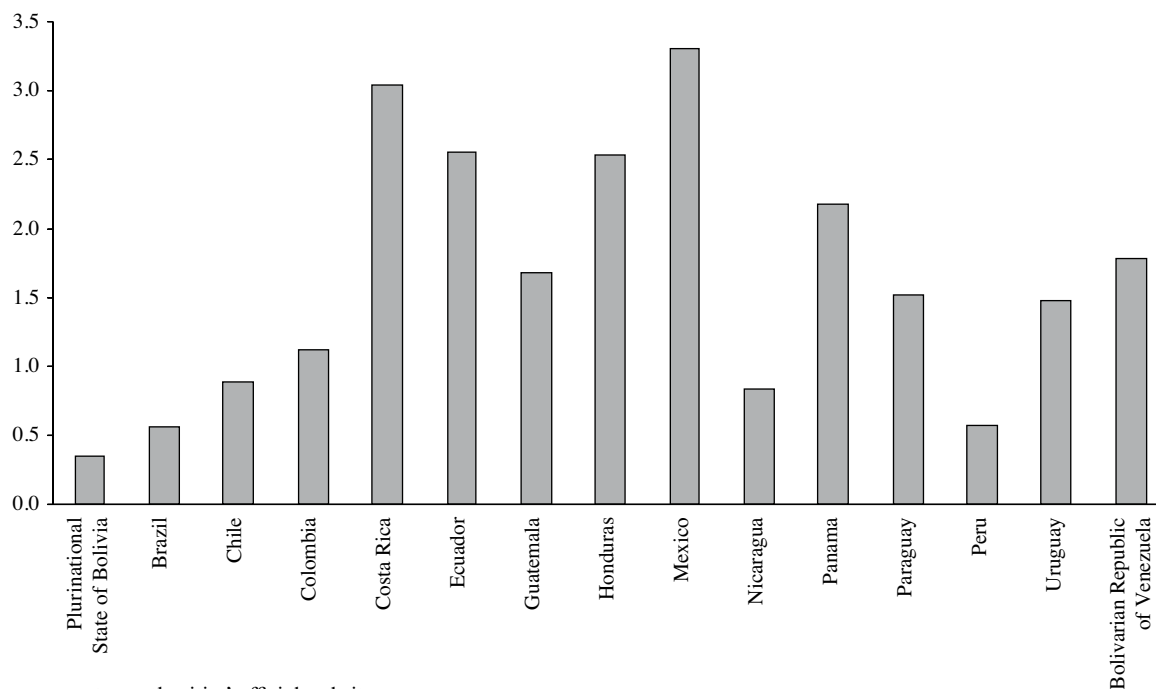
^b ICOR (b) is defined as the GFKF/GDP ratio (year t) divided by the annual real GDP growth rates (year t+1).

^c Country sample includes data for Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint. Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^d Country sample includes data for Argentina, Bolivarian Republic of Venezuela, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru and Uruguay.

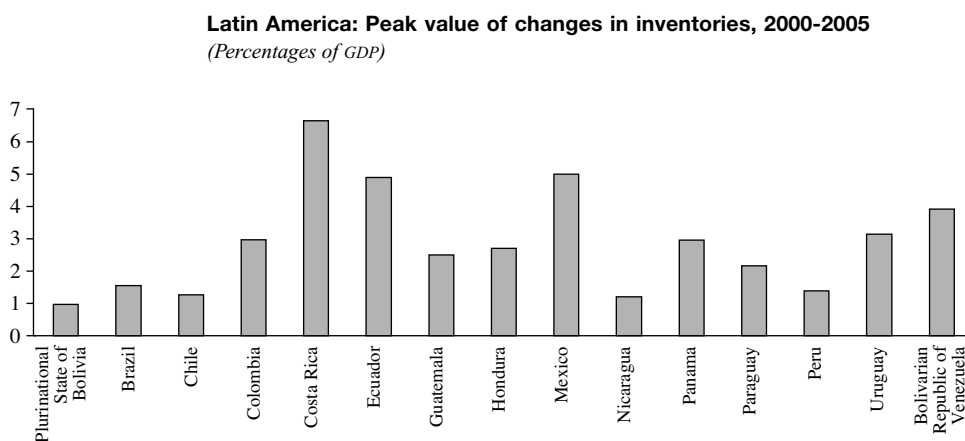
FIGURE 6

Latin America: Average changes in inventories, 2000-2005
(Percentages of GDP)



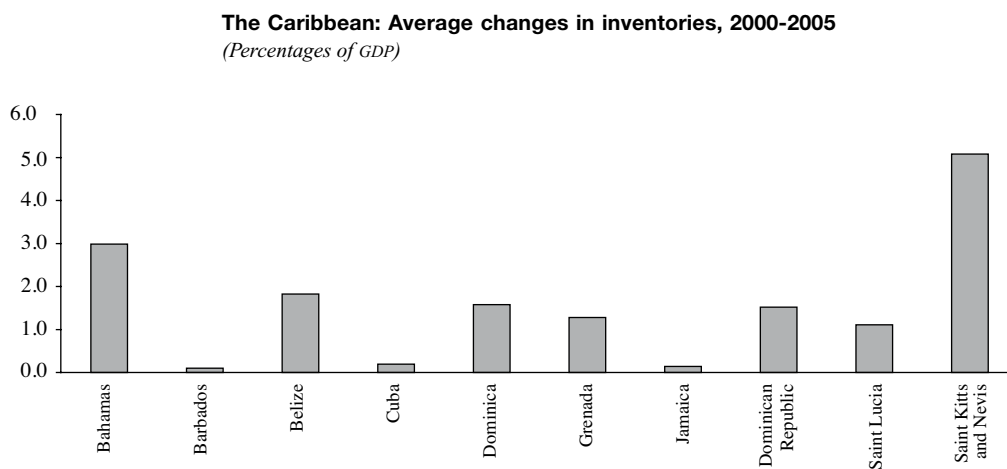
Source: country authorities' official websites.

FIGURE 7



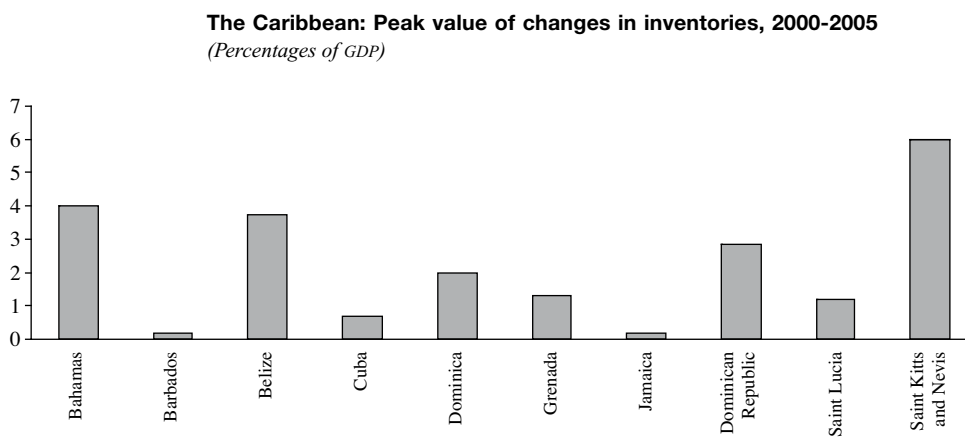
Source: country authorities' official websites.

FIGURE 8



Source: country authorities' official websites.

FIGURE 9



Source: country authorities' official websites.

IV

Estimation bias in the Compilation of Nominal GDP Figures: A First Approximation

The revisions of national accounts statistics in Latin American countries that simultaneously updated the base year of their GDP estimates and implemented the 1993 SNA provide a broad indication of the estimation bias for national accounts in countries which currently use an outdated base year and lag behind in the implementation of the 1993 SNA. According to the information compiled by ECLAC, as of June 2007, some 23 countries (out of a total of 33 countries in Latin America and the Caribbean) implemented the 1993 SNA methodology, although only eight countries¹³ (out of a total of 33 countries in the region) had national accounts' base years that were less than 10 years old. The remaining 25 countries either have plans for rebasing national accounts statistics or have started the process in the recent past.

What can we expect from the prospective national accounts data revisions in the region? Could we anticipate, with the information at hand, the size of the potential GDP revisions? This section uses the trends in recent data revisions to address these questions (see section III above).

Table 7 lists our estimates of three sources of possible biases in the nominal GDP estimates in the region: (i) underestimations of nominal GDP due to an outdated base year, data coverage issues and lagging implementation of the 1993 SNA, (ii) downwards biases in the measurement of household final consumption expenditure, and (iii) a possible overestimation of gross fixed capital formation in construction activities. Table 7 does not include possible estimation biases regarding the value of changes in inventories; a task that would entail an estimation effort beyond the scope of this paper.

From the experience of the last 15 years in Latin America, we conclude that the largest estimation bias—chiefly understating the level of GDP estimates in the region—is due to the use of an outdated base year and the lagging implementation the 1993 SNA. The

estimation biases resulting from measurement problems with household final consumption expenditure and gross capital formation in construction activities are smaller, although they could affect the composition of GDP from the expenditure side. The remainder of this section elaborates on the aforementioned sources of nominal GDP estimation biases.

TABLE 7

Latin America and the Caribbean: Biases in nominal GDP calculations^a
(Percentage points of nominal GDP, by year)

Nature of bias	Range of bias and median point estimates
I. Factors affecting nominal GDP levels	
GDP underestimation due to outdated benchmark year and weak SNA93 implementation	-8.2 to 19.2 [8.8]
II. Factors affecting nominal GDP composition	
Under-estimation of household final consumption expenditure ^b	0.47 to 1.3 [0.896]
Overestimation of gross fixed capital formation in construction ^c	-1.0 to -1.5 [-1.25]

Source: authors' estimates.

- ^a Numbers in brackets are the median estimates.
^b Range and median point estimate applies to total actual final consumption level equivalent to 75% of GDP.
^c Range and median point estimate applies to a gross fixed capital formation in construction level equivalent to 10% of GDP.

1. Nominal GDP underestimation due to outdated base year and lagging implementation of 1993 SNA

The experience in Latin America shows that, in general, a change in the national accounts' base year along with the implementation of the 1993 System of National Accounts leads to increases in nominal GDP levels, although there have also been cases in which the revisions led to lower GDP figures (see box 2) owing

¹³ Belize, Brazil, Chile, Colombia, Guatemala, Honduras, Mexico and Trinidad and Tobago.

to an obsolete previous base year and a generalized use of fixed technical ratios in extrapolations at the aggregate level.

The experience to date is likely to replicate in the future as countries update their national accounts base years and implement the 1993 SNA methodology. Except for Chile and Mexico, whose national accounts base years date from 2003, base years in the other 31 countries in Latin America and the Caribbean are much older than the five-year maximum lapse for updating recommended by the 1993 SNA.¹⁴ Also, country-specific information compiled by IMF confirms that the main improvements to national accounts' source data should include updates of business directories/registers and agriculture and livestock censuses to improve coverage and statistical sampling techniques in the context of revising the national accounts' base year. Information gaps in the services sector are likely to remain a challenge given the importance of the small- and medium-size enterprises in this sector that are not usually captured in the economic surveys, as well as the relevance of informal service activities, which are not investigated and recorded in official statistics.

2. Underestimation of Household Final Consumption Expenditure

As noted above, when national accounts are rebased, the new data tend to show a lower share of final consumption in GDP. However, this is not always the case as large Latin American countries—particularly those with relatively robust source data such as Brazil, Chile and Colombia, for example— have reported higher ratios of final consumption expenditure to GDP in the context of updating their national accounts and implementing the 1993 SNA.

While only a detailed analysis could identify the measurement of consumption bias in the GDP calculations for each country, a number of factors warrant some reservations regarding the lower share of total consumption in GDP reported in recent national accounts revisions. These factors include, on the one

hand, downward biases from the pending inclusion of imputed rental of owner-occupied housing, FISIM and consumption of NPISH in total final consumption expenditure figures and, on the other, inconsistencies between (i) Engel curve econometric estimations that confirm strong economic growth and changing household spending patterns—see, for example, Carvalho Filho and Chamon (2006) estimates for Brazil, and Dávila and Levy (2003) and INEGI (2000) for a review of consumption patterns in Mexico—and (ii) the reduced poverty rates, low inflation, expanding credit and gradual trade liberalization reported in the region.¹⁵ Estimation of national accounts consumption as a residual adds yet another source of potential error in the computation of household final consumption expenditure. All in all, our assessment of the downward nominal consumption bias is within a range of 0.624% to 1.764% per year (see footnote number 10 for the detailed calculation). Assuming that consumption represents around 75% of GDP, the median point estimate would be about 0.896% per year.

3. Overestimation of gross fixed capital formation in construction

We approximate the bias in the measurement of gross fixed capital formation in construction activities by inferring/deducting the level of this type of spending that would yield ICOR levels close to the international norm of between 3 and 3.5. We acknowledge, however, that the use of the ICOR should only be considered a first step towards assessing a possible estimation bias in construction activities.

The sensitivity analysis indicates that a 10%-15% reduction per year in fixed gross capital formation in construction would significantly approximate average ICOR levels in Latin America and the Caribbean to the international norm (see centre and bottom panels of table 8). With average ratios of gross fixed capital formation in construction activities to GDP equivalent to about 10%, a 10%-15% reduction in these ratios would be equivalent to a 1-1.5 percentage point reduction of GDP. Our view is that, except for a few Latin American countries that are leading the way in terms of the implementation of the 1993 SNA, a 10%-15% potential overstatement in gross fixed capital formation in construction is a realistic assessment

¹⁴ The main countries (in terms of relative GDP size) in Latin America and the Caribbean that have yet to rebase their national accounts and fully implement the 1993 SNA include Argentina, Bolivarian Republic of Venezuela, Dominican Republic, Ecuador and Peru, which together represent some 25% of the region's nominal GDP. In all cases, the current national accounts base year dates from the mid-1990s and is unlikely to represent the countries' current economic structure and relative price spectrum.

¹⁵ As reported in Singh and others (2005), for example.

given the current source data shortages facing many national statistical institutes in the region. Leading countries like Colombia, for example, have invested significant human and financial resources to address these statistical challenges, especially when measuring construction activities undertaken by households for the purpose of their own gross capital formation and/or in the informal sector of the economy.¹⁶ The Colombian authorities' efforts include focussing on the assessment of new production, stalled production, production in course, quality of dwellings, the amount and type of manpower used in construction activities and the market value per square metre of dwellings sold in the market. These efforts have complemented

the more traditional censuses of finalized dwellings offered to the market, i.e., construction activities that are usually undertaken by corporations rather than households for their own final use.

The Bolivarian Republic of Venezuela and Brazil are yet other examples of significant statistical efforts to produce robust estimates of gross capital formation in construction.¹⁷ The experience of the Bolivarian Republic of Venezuela, Brazil and Colombia, however, are considered notable exceptions to the more general statistical weakness facing national accounts compilers when assessing construction activities in the formal and informal sectors of the economy, as well as household construction activities for own final use.

¹⁶ See Colombia, National Administrative Department of Statistics (2007).

¹⁷ See IBGE (2007) and Central Bank of Venezuela (2003).

TABLE 8

Latin America: Sensitivity analysis under alternative ratios between GDP and gross capital formation in construction, 1995-2005^a
(Percentages)

	1995	2000	2002	2003	2004	2005	Average ICOR 2003-2005
I. Baseline							
Total GFKF/GDP ratio	19.6	19.6	17.7	17.5	18.3	19.0	
of which: GFKF in construction/GDP ratio	9.6	10.1	9.4	9.4	9.6	10.2	
ICOR (a) ^b	3.0	3.1	7.5	5.7	3.7	4.1	4.5
ICOR (b) ^c	3.0	8.4	5.7	3.5	4.0	3.6	3.7
II. 10% decline in GFKF in construction							
Total GFKF/GDP ratio	18.6	18.6	16.7	16.5	17.3	18.0	
of which: GFKF in construction/GDP ratio	8.6	9.1	8.4	8.5	8.6	9.1	
ICOR (a) ^b	2.8	2.9	7.1	5.3	3.5	3.9	4.2
ICOR (b) ^c	2.9	7.9	5.4	3.3	3.7	3.4	3.5
III. 15% decline in GFKF in construction							
Total GFKF/GDP ratio	18.2	18.1	16.2	16.0	16.8	17.5	
of which: GFKF in construction/GDP ratio	8.1	8.6	8.0	8.0	8.2	8.6	
ICOR (a) ^b	2.8	2.8	6.9	5.2	3.4	3.8	4.1
ICOR (b) ^c	2.8	7.7	5.3	3.2	3.6	3.3	3.4

Source: database of the Economic Commission for Latin America and the Caribbean (ECLAC) and authors' calculations.

^a Country sample includes data for Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Plurinational State of Bolivia and Uruguay.

^b ICOR (a) is defined as the GFKF/GDP ratio (year t) divided by the annual real GDP growth rates (year t).

^c ICOR (b) is defined as the GFKF/GDP ratio (year t) divided by the annual real GDP growth rates (year t+1).

V

Concluding Remarks

This paper has reviewed the Latin American experience with the implementation of the 1993 SNA and the update of the national accounts' base year. It has also made a preliminary assessment of the possible bias in nominal GDP estimates for the Latin American and Caribbean region.

Our analysis points to a number of preliminary conclusions:

- Data revisions stemming from the implementation of the 1993 SNA and the update of the national accounts base year have been projects implemented with the participation of numerous institutions over a span of about 5 to 6 years. The IMF contribution towards this endeavour has been the fielding of technical assistance and multisector missions, as well as the performance of data ROSC. These have supported country authorities in their efforts to fulfil their responsibility regarding the improvement of the collection of basic data and the implementation of best international practices for the compilation of national accounts. Economic policymakers have generally agreed that the implementation of national development strategies requires basic knowledge about the size and structure of the national economy. This is also consistent with evidence-based policymaking, which has been a key topic of discussion in international forums in recent years.
- Data ROSC in Latin America have pointed out a number of data quality issues. Common weaknesses/challenges across countries include the need to: allocate commensurate human and financial resources to run statistical programmes; improve the collection of basic source data for national accounts compilation (especially improve data collection routines for the service sectors, output produced for own final use and informal sector activities); and foster stronger inter-institutional coordination among data producers and compilers in countries across the region.
- Revisions to national accounts data in the context of implementing the 1993 SNA and rebasing the accounts have led to changes for nominal GDP levels within a range of -8.2% to 19.2% (excluding Nicaragua) with a median point estimate of 8.8%, as most of the national accounts revisions led to higher nominal GDP levels compared with earlier estimates.
- Revisions to national accounts statistics have led to reassessments of countries' per-capita incomes, the leading sectors in the local economy and the primary distribution of income. Regarding the latter, Latin American countries have shown higher income shares in the total income of the economy accruing to corporations and unincorporated enterprises owned by households (mixed income in the 1993 SNA taxonomy) at the expense of the income share accruing to employees.
- The data revisions have also yielded estimates of real GDP growth rates that are somewhat higher for a number of consecutive years than those assessed under the old national accounts series. While the jury is still out on how to split increases in price and volume indices, expert opinion is that the price-quantity split warrants some caution as, in the absence of robust source data, compilers may tend to exaggerate the stability of volume trends at the expense of added variability to price indices. Also, a number of Latin American statistical agencies are lagging behind in the compilation of data related to producer price indices and the simultaneous construction of supply and use tables at current and constant prices which are useful for filling data gaps, assessing the consistency of (value, volume and price) estimates and meeting a number of analytical requirements for price and volume index numbers recommended by the 1993 SNA.
- Policymakers and the public in general have welcomed revisions to national accounts statistics, although a number of data puzzles remain. In particular, higher economic growth estimates have coincided with lower total consumption as a share of GDP in the majority of the countries that revised their national accounts statistics. Also, gross fixed capital formation to GDP ratios and their implied incremental capital output ratios (ICORs) have remained high by international standards. Our preliminary analysis suggests that the referred data puzzles reflect a likely underestimation of household final consumption

and an overestimation of gross fixed capital formation in construction activities, especially in countries with significantly outdated national accounts base years and/or limited funding for statistical offices to address the problem of measuring construction activities for own final use and in the informal sector. Estimation issues with the value of changes in inventories were also seen to be a remaining challenge for statistical agencies in the region.

- All in all, a tentative conclusion from the paper is that nominal GDP figures for Latin America and the Caribbean may be underestimated typically by about 8.8% due to pending updates in the national accounts' base year, including improvements in

the coverage of services and informal activities, and efforts to fully implement the 1993 SNA methodology. Currently, there are only two countries in the whole region whose national accounts' base years are within the 1993 SNA recommended five-year timeframe for updating. Meanwhile, important source data shortfalls in the compilation of national accounts statistics persist. The estimation biases stemming from problems measuring household final consumption and gross fixed capital formation in construction activities are smaller than those resulting from the use of obsolete base years, although they could affect the composition of GDP from the expenditure side.

(Original: English)

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