Bolivia: Selected Issues

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BOLIVIA

Selected Issues

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Approved by the Western Hemisphere Department

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I. GROWTH PERFORMANCE[1]

1. **This paper analyzes Bolivia's growth performance since the 1960s, seeking to clarify why trend per capita growth has not been higher in recent years despite some of the most extensive structural reforms of any Latin American country**. It is organized as follows: Section A analyses Bolivia's growth record compared to the rest of Latin America, with particular focus on the regional and sectoral patterns of growth, and examines the sources of growth; Section B tries to explain why growth has not been higher in Bolivia, focusing on two factors: volatility and the role of institutions. Section C concludes with some policy implications.

A. Long-Term Trends

2. **Growth in Bolivia has been poor relative to that in the rest of Latin America.**[2] As evidenced by Figure 1, growth—in both levels and per capita terms—has been lower in virtually all sub-periods, except most recently. The relatively poor performance of Bolivia is accentuated in per capita terms because of a high population growth rate, with an average growth rate of 2½ percent during 1960–2004 translating into negligible (0.3 percent) average per capita growth. As a consequence, instead of the convergence that would have been expected on theoretical grounds, the pattern of the last 40 years is one of divergence, with Bolivia currently having per capita income of less than a quarter of the average for the rest of Latin America, and remaining the poorest country in South America.

3. **Growth has also been volatile.** During the 1960s and 1970s, real output growth rates were relatively high and mainly the result of booms in the mining sector and capital inflows. The 1980s were a "lost decade" with almost no growth as the country faced political and debt crises that ended in a collapse in real output growth and hyperinflation. Although price stability was broadly restored, real growth only resumed in 1987 and remained low until the early 1990s. The period 1991–1998 was the "golden period" for Bolivia, with average annual growth of 4½ percent. During these years, private investment, in particular foreign investment, rose sharply as the government launched a comprehensive privatization program in the electricity, telecommunications, hydrocarbons, water, and transportation sectors. Indeed, during this period the investment ratio-to-GDP increased by 6 percentage points, to a high of 18 percent in 1998. During 1999–2002, growth slowed down significantly, as the economy was hit by a series of negative shocks—including intensified coca eradication, the devaluation in Brazil, and the crisis in Argentina.

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[1] Prepared by Borja Gracia, Pablo López-Murphy, and Ravi Balakrishnan.

[2] The rest of Latin America comprises Argentina, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela and the measure of real GDP growth is weighted by GDP levels of the countries in the sample.

Figure 1. Bolivia: Relative Growth Performance

Real GDP Growth (In percent)

■ Bolivia
■ Rest of Latin America

(1961-1970, 1971-1980, 1981-1990, 1991-1998, 1999-2002, 1960-2002)

Real GDP per capita Growth (In percent)

■ Bolivia
■ Rest of Latin America

(1961-1970, 1971-1980, 1981-1990, 1991-1998, 1999-2002, 1960-2002)

Nominal GDP per capita (In US dollars)

Rest of Latin America
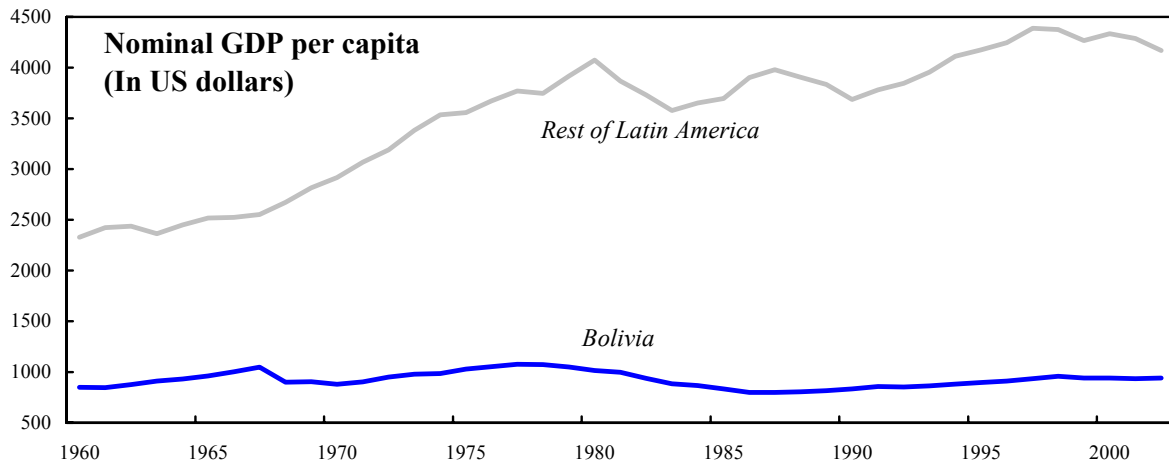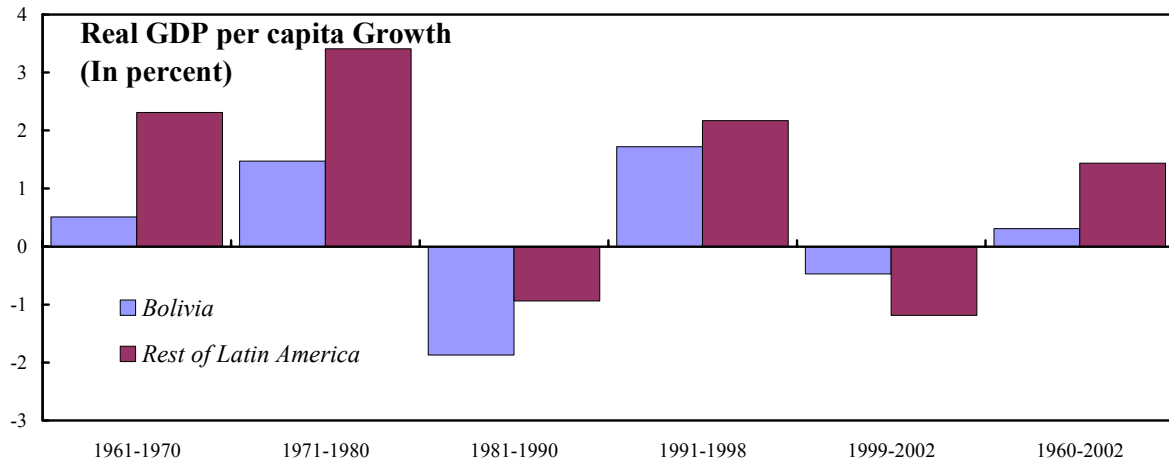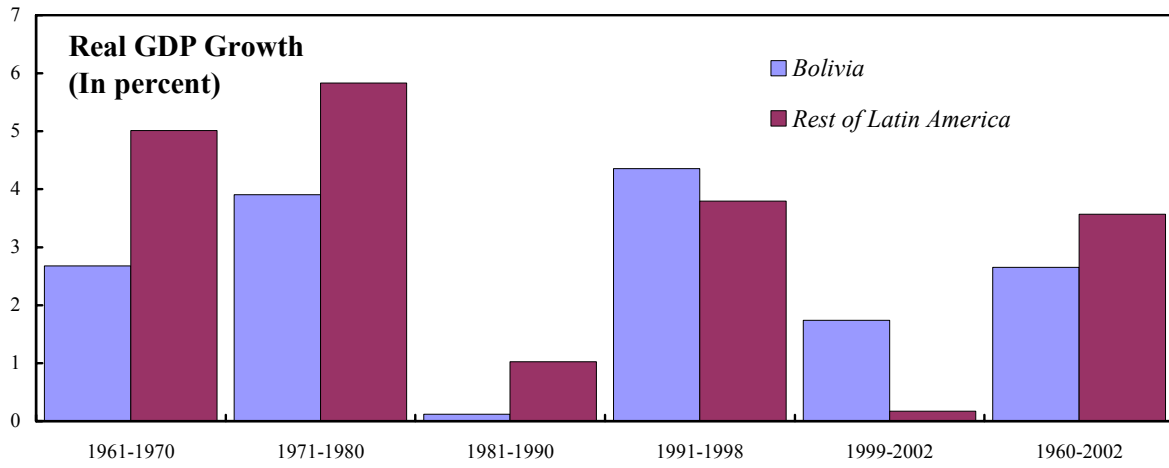
Bolivia

Source: IMF

Sectoral, expenditure, and regional trends

4.   **The hydrocarbons sector has become increasingly important.** In terms of contribution to growth, the key economic sectors in Bolivia since 1990 have been manufacturing, agriculture, and transport and communication (Figure 2). However, the importance of various sectors has changed over time, and the hydrocarbons sector has been an increasingly important contributor.

5.   **Despite its continuing low productivity, the agricultural sector remains one of the most important of the economy.** During 1994–2004 it accounted for 14 percent of GDP, but employed 42 percent of the working population, and generated 28 percent of exports. Negative cyclical shocks, such as El Niño, which have produced significant volatility in the sector, were particularly severe in the 1990s.

6.   **On the expenditure side, the shift toward hydrocarbons is reflected in an increased contribution of exports, while that of investment has declined markedly.** The main drivers of the historically high growth during 1991–98 were consumption and investment (Figure 2). However, the contribution of investment has been reversed since the completion of activities associated with the capitalization process. During 1999–2004, investment made a negative contribution to growth, with exports—largely hydrocarbons exports to Brazil and Argentina—being the main driver of growth.

Figure 2. Bolivia: Sectoral and Expenditure Composition of GDP Growth

**Sectoral Growth 1991-1998
(In percent of total)**

■ *Growth Contribution Percentage*

■ *Initial Shares in GDP*

Agriculture Hydrocarbons Manufacturing Construction Transport Rest

**Sectoral Growth 1999-2004
(In percent of total)**

■ *Growth Contribution Percentage*

■ *Initial Shares in GDP*

Agriculture Hydrocarbons Manufacturing Construction Transport Rest

**Expenditure Components 1991-1998
(In percent of total)**

■ *Growth Contribution*

■ *Initial Shares in GDP*

Public Cons. Private Cons. Investment Exports Imports

**Expenditure Components 1999-2004
(In percent of total)**

■ *Growth Contribution*

■ *Initial Shares in GDP*

Public Cons. Private Cons. Investment Exports Imports

Source: National Accounts Data

7.   **Regional patterns of economic growth mirror sectoral shifts (Figure 3).** The pattern of regional growth rates changed considerably over the periods 1989–98 and 1999–2004, with Santa Cruz and Oruro having the highest growth rates during the first period, and Tarija in the second. The collapse in mining activities (important in Oruro) and growth of hydrocarbons production (more than 30 percent of total output in Tarija) largely explains these trends.

8.   **Bolivia has experienced a process of regional divergence, evidenced by an increase in the standard deviation of regional per capita income**. The evolution of per capita GDP has been very different from region to region, with the valleys (particularly Tarija) having experienced a much larger increase in per capita income than the lowlands or highlands (Figure 3). At the same time, measures of spatial clustering reject the idea that incomes are randomly distributed across regions (Box 1). Contrary to other Latin American countries (Brazil, Chile, and Mexico) where rich and poor states cluster separately, poor states have rich neighbors and vice versa. The geography of Bolivia and the importance of its natural resources may have contributed to this pattern.

Figure 3. Bolivia: Regional Income Dynamics

Real GDP Growth

Contribution to Growth (in percent)

Real per Capita GDP

Standard Variation of Real Per Capita GDP
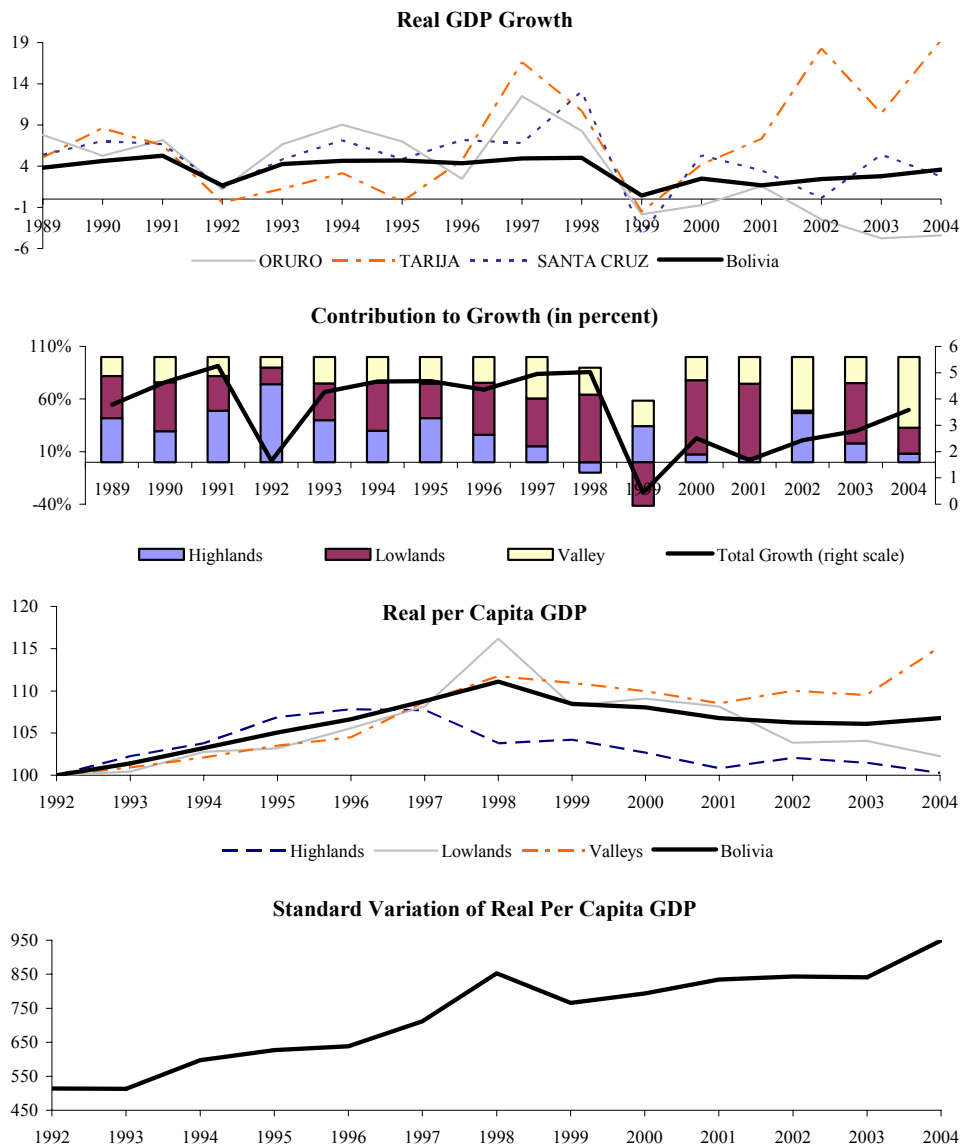
Source: INE and Authors' Calculations

9.   **Furthermore, high growth in one region has been accompanied by low or negative growth in the other regions.** In particular, the correlation between the two most important regions, Santa Cruz and La Paz[3]is -0.47. Asymmetry in the impact at the regional level of fluctuations in the terms of trade may provide a partial explanation. The simple correlation between terms of trade and regional growth is very negative (-0.36) in the highlands (with large nonhydrocarbons export sectors), marginal in the lowlands (0.08) and positive and large (0.39) in the hydrocarbons-rich valleys.

Sources of growth[4]

10.   **Over the total period considered in this Section (1971–2002), growth in Bolivia is fully attributable to factor accumulation, although in the sub-periods of higher growth total factor productivity (TFP) was an important contributor**. The contribution of factor accumulation is important in all sub-periods, with labor contributing a stable share (Table 1). Meanwhile, the contributions of capital accumulation and TFP growth were highly volatile, and slightly negative in the case of TFP over the entire period.[5] Capital accumulation largely accounts for growth differences between Bolivia and the rest of Latin America over the long term. The contributions of labor and TFP are almost identical.

Table 1. Bolivia: Sources of Growth 1971-2002

| Period | Output | Contribution of | | |
		Labor	Capital	TFP
1971-1980	3.9	1.9	1.7	0.4
1981-1990	0.2	1.8	0.0	-1.7
1991-1998	4.4	1.4	1.1	1.9
1999-2002	1.7	1.2	1.9	-1.3
1971-2002	2.6	1.7	1.0	-0.1
Memorandum item:				
Rest of Latin America 1971-2002	3.1	1.7	1.5	0.0

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[3] Accounting for 30 percent and 25 percent of GDP in 2005 respectively.

[4] The methodology and assumptions used in this Section are described in detail in Appendix 1, and the results of the exercise are summarized in Table 1.

[5] Loayza, Fajnzylber, and Calderon (2004) obtain a lower contribution of capital and a higher contribution of TFP, as they use a higher initial capital-output ratio in 1970 (of around six), which appears implausibly high for a poor country like Bolivia, based on the evidence presented by McGrattan and Schmitz (1998).

Box 1. Bolivia: Spatial Association and Regional Divergence

Moran's I Statistic

According to measures of global spatial clustering, the tendency in Bolivia, in contrast with other Latin America countries, is for rich and poor regions to cluster together. This tendency has increased over the last decade contrary to the experience in Chile and Mexico. In these two countries and in Brazil, rich regions have rich neighbors and poor have poor neighbors. In particular, the most well known measure of spatial relatedness— Moran's *I* statistic—has become increasingly negative for Bolivia and increasingly positive for Chile and

Bolivia: Moron's I Spatial Correlation

	Bolivia	Brazil	Chile	Mexico
1992	-0.32	0.70	0.58	0.33
2000	-0.41	0.69	0.77	0.42

Source: INE and Authors' Calculations

Mexico. In Brazil it is highly positive but stable. *I* is a standardized measure of correlation between neighboring

observations and is defined as, $I = \dfrac{n}{\sum\limits_{i=1}^{n}\sum\limits_{j=1}^{n} w_{ij}} \dfrac{\sum\limits_{i=1}^{n}\sum\limits_{j=1}^{n} w_{ij}\left(y_i - \bar{y}\right)\left(y_j - \bar{y}\right)}{\sum\limits_{i=1}^{n}\left(y_i - \bar{y}\right)^2}$ where *n* is the number of regions, y_m

is standardized per capita income region *m*, $\bar{y}$ is its mean, and w_{ij} is the standardized spatial proximity of

regions *i* and *j*. Negative values of the statistic indicate negative spatial autocorrelation, or a clustering of dissimilar values. Positive values are associated with clustering of similar attribute values.

Spatial Scatter plot

Remarkably, no single rich or poor region clusters with another region of the same type. The Moran's *I*, a global statistic, can be decomposed into the Local Index of Spatial Association, which is defined as,

$I_i = \left(y_i - \bar{y}\right)\sum\limits_{j=1}^{n} w_{ij}\left(y_j - \bar{y}\right)$. This local

statistic can be combined with the global version to obtain a graphic tool for detecting spatial association, the Moran's scatter plot. The so-called spatial lag of location *i* is defined as

$\sum\limits_{j=1}^{n} w_{ij}\left(y_j - \bar{y}\right)$ so that *I* is formally equivalent

to an OLS regression coefficient in a regression

Bolivia: Income Dynamics and Space

Source: Ine and Authors' Calculations

of a location's spatial lag on itself. Thus, Moran's *I*, can be visualize as the slope of the regression line in a scatter plot of a location's spatial lag and itself. The scatter plot is centered on the coordinate origin and the density of the quadrants represent the dominating local spatial process. It helps determine the extent of linear association between the values in a given region (x-axis) with values of the same variable in neighboring locations (y-axis). It divides the x-y space into four quadrants, corresponding to four types of possible local spatial associations. In the first quadrant rich states coincide with rich neighbors; in the second poor states have rich neighbors; in the third poor states are surrounded by poor neighbors; and in the fourth rich states have poor neighbors. A comparison of the 1992 and 2004 scatter plots shows a clear persistence in the relative positions of the regions with two distinct groups. Rich regions have relatively poorer neighbors and vice versa.
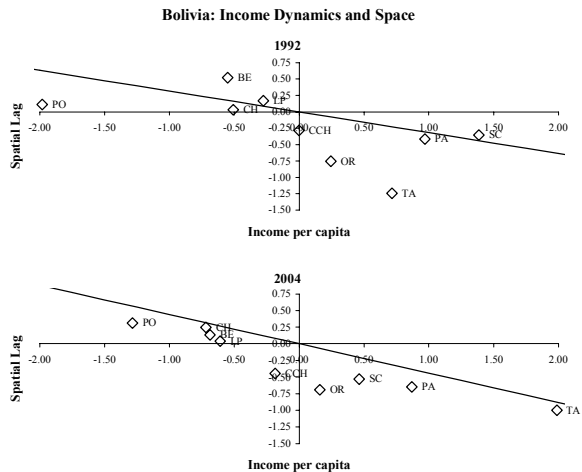
B.   The Role of Volatility and Institutions

11.   **Two aspects of the trends described above stand out, a lack of convergence in per capita income with the rest of Latin America and the poor contribution of TFP.** The lack of convergence is associated with lower capital accumulation over the last three decades in Bolivia than in the rest of Latin America—despite a lower initial capital-output ratio. The poor contribution of TFP mirrors developments in the rest of Latin America, suggesting that the region as a whole has had a problem in creating an environment conducive to productivity enhancements.

12.   **These aspects are somewhat puzzling in light of the comprehensive structural reforms undertaken by Bolivia.** As noted in the Ex Post Assessment of Longer-Term Program Engagement (EPA 2005), between 1985 and 1999, Bolivia undertook some of the most extensive structural reforms of any Latin American country. According to a structural reform index compiled by Lora (2001),[6] Bolivia's structural reforms started from a lower base than in most other countries, and occurred in two main phases: from 1985 until about 1991, when financial sector and trade reform were implemented; and during 1995–97, when reforms included a wave of privatizations and further financial sector reform. After the first phase, Bolivia's structural reform index was in line with the Latin American average, while the second phase placed it as Latin America's leading reformer (Figure 4). Subsequently, in the period through 2003, Bolivia's index has displayed a steady decline.

**Figure 4. Bolivia and Other South American Countries:
Structural Reform Index, 1985-2003**

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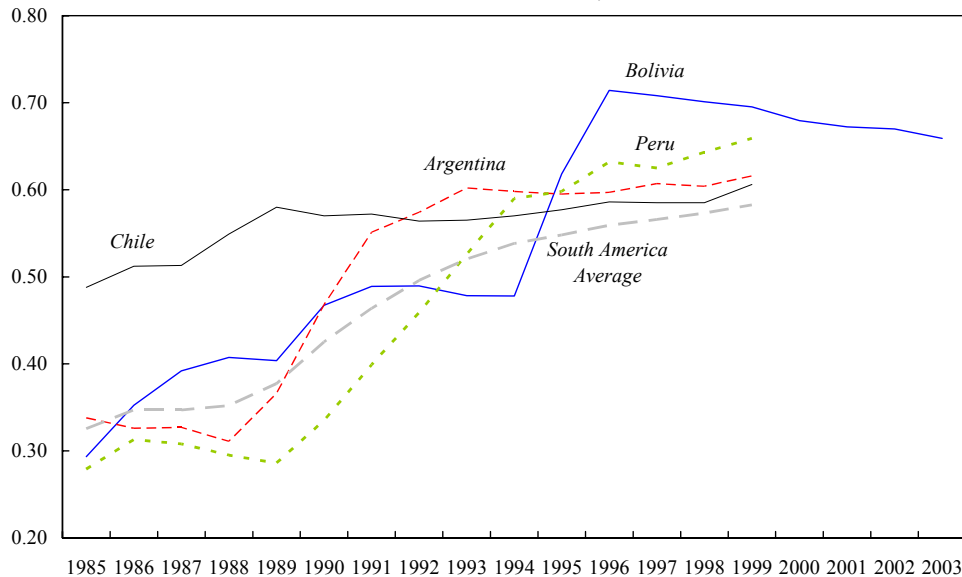
[6] The reform index reflects movements in 5 reform areas: (i) trade policy; (ii) financial sector policy; (iii) tax policy; (iv) privatization; and (v) labor legislation.

13.   **As noted in the Spring 2005 WEO (Chapter II), economic theory does not provide clear guidance of the impact of volatility on growth.**[7] Indeed, some papers argue that volatility could *increase* economic growth. For example, some theories have countries facing a choice between high-variance, high-mean return technologies and low-variance, low-expected return technologies. In such a world, higher average growth rates would be correlated with more volatile growth rates. Other papers argue that volatility *decreases* growth. Increased volatility reduces the risk-adjusted return on capital, and thus the overall savings rate falls. If there are irreversibilities in investment, then increased volatility and uncertainty can lead to lower investment (Bertola and Caballero 1994).

Table 2. Total Volatility and its Contributors in Real Per Capita Output Growth

	Total Volatility	Global	Regional	Country
Bolivia	2.7	24.81%	5.35%	69.84%
Brazil	4.1	33.44%	17.09%	49.47%
Chile	5.5	16.51%	5.68%	77.82%
Colombia	2.0	30.18%	16.08%	53.74%
Ecuador	5.0	18.85%	7.46%	73.69%
Paraguay	3.9	10.57%	5.93%	83.50%
Uruguay	5.4	6.35%	40.85%	52.80%
Venezuela	4.4	2.53%	9.10%	88.38%
Peru	5.7	1.20%	37.72%	61.09%
Argentina	6.4	2.10%	31.55%	66.35%
South America Average	**4.5**	**14.65%**	**17.68%**	**67.67%**

14.   **However, a high level of volatility, together with limited improvements in key institutions, appears to have adversely affected Bolivia's growth performance.** High macroeconomic volatility could be associated with political instability. Even by Latin American standards, Bolivia has had a particularly tumultuous political history. There were more than 190 changes of government since independence in 1825—more than one change of government per year. In any event, high inflation, deposit runs, currency crises and other forms of economic turbulence were recurrent features in Bolivia until the mid-1980s. Fiscal policy has also remained volatile. With regard to institutions, there is a large recent literature attesting to their crucial role in the growth process. Hall and Jones (1999) argue that most of the differences between countries in GDP per capita are explained by differences in levels of TFP, which are closely linked to the quality of institutions. A study

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[7] The WEO utilizes a dynamic factor model to decompose output volatility into: (i) an overall *global factor,* which captures events that affect real per capita output in all countries—such as an increase in global interest rates or growth; (ii) a *regional factor,* which captures events that affect real per capita growth in all countries in a particular region—such as capital flows, or terms of trade shocks; and (iii) a *country-specific factor,* which captures events that only affect real per capita growth in an individual country—such as political and macroeconomic instability, and the quality of institutions. It finds that for emerging market and developing economies, except East Asia, at least 60 percent of output volatility is attributable to country-specific factors (see Table 2 for South American countries and Appendix 2.2 of the April 2005 WEO for details of the methodology.

in the WEO (2003) concluded that improvements in institutions lead to higher incomes, stronger growth and lower volatility, a result which was quite robust and independent of the specific measure of institutional quality adopted.

15.   **While total output volatility is not high in Bolivia relative to other South American countries, the different components of output are significantly more volatile than total output itself (Table 3).** Using the standard deviation of real per capita GDP growth, volatility in Bolivia over the period 1993–2004 is below 1.5 with an average growth over the period of 1.26. However, when output is disaggregated by its spending components, each is much more volatile than total output. The same is true when output is disaggregated regionally, with in particular output in the lowlands (Santa Cruz, Beni, and Pando) being 2.4 times more volatile than total output. Thus, the low volatility of total output is associated with the negative correlation of regional outputs,[8] rather than with structural stability.

Table 3. Volatility and Average Growth Rate of Real Per Capita Variables

	1991-1997		1998-2004		1991-2004	
	Volatility	Av. Growth	Volatility	Av. Growth	Volatility	Av. Growth
C	1.40	1.51	2.23	-0.72	2.13	0.39
I	10.01	8.59	17.62	-3.82	15.20	2.38
Ip 1/	7.94	0.83	13.53	4.56	10.83	2.70
G	8.21	1.07	10.20	-3.53	9.21	-1.23
Ex	8.11	1.11	13.01	6.78	10.82	3.94
Im	6.63	5.17	10.67	-0.49	9.02	2.34
ToT 2/	6.45	-2.20	5.91	3.22	6.57	0.51
Highlands	1.49	2.47	1.63	-0.19	2.04	1.14
Lowlands	2.11	1.37	4.47	0.10	3.42	0.74
Valley	1.92	1.52	2.37	1.68	2.07	1.60
Bolivia	1.21	1.96	1.39	0.55	1.45	1.26

1/ Public Investment

2/ Terms of trade

16.   **Furthermore, the correlation between overall output volatility and growth is negative and large.** Hnatkovska and Loayza (2004) find that using the standard deviation of either per capita GDP growth or the output gap as a measure, volatility in Bolivia for the period 1960–2000 is below the average of 79 countries around the world (including industrialized countries). However, they argue that the correlation between output growth and volatility is particularly large and negative in Bolivia (-0.75 for the period 1974–2003).[9] A negative relationship between volatility and growth has also been reported in other

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[8] The simple correlation between the highlands and lowlands, accounting for 37% and 34% of GDP in 2004 respectively, is -0.31.

[9] Hnatkovska and Loayza find a correlation of -0.44 for low-income economies.

studies using different methodologies and data sets.[10] Hnatkovska and Loayza also find that the negative correlation between growth and volatility appears to coincide with poverty, institutionally and financial underdevelopment, and procyclical fiscal policies.

Fiscal policy and terms of trade shocks

17.   **In a small open economy like Bolivia, determining the relative contribution of policy and terms of trade shocks to output volatility is a key issue.** In terms of explaining output volatility, fiscal policy shocks account for short run movements and terms of trade shocks become more important for long run movements. [11] Table 4 shows that most (around 85 percent) of output volatility in the short run (around one year) is explained by spending shocks. [12] Over the long run, terms of trade fluctuations explain about half of output volatility.

Table 4. Variance Decomposition of Real Per Capita Output Growth

quarter	Gov. spending shock	Tax revenue shock	Terms of trade shock
q=0	85.66%	1.42%	12.92%
q=4	52.06%	1.32%	46.62%
q=8	47.46%	1.28%	51.26%
q=12	45.79%	1.27%	52.94%
q=16	44.90%	1.27%	53.83%
q=20	44.35%	1.27%	54.39%

18.   **While increases in government expenditure contribute to volatility, they have only a small effect on output.** The impulse responses in Figure 5 show that a positive spending shock is expansionary, inflationary, and produces a persistent increase in both spending and revenue, resulting in a larger deficit. However, the effect on output is very small: a 1 percent increase in real government spending increases real GDP by only around 0.11 percent in the long run.

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[10] Ramey and Ramey (1995) and Kose, Prasad and Terrones (2005).

[11] This paper identifies fiscal policy and terms of trade shocks using a VAR methodology, which allows the quantification of the relative importance of both shocks in determining macrodynamics. Details about the methodology are described in Appendix 2.

[12] Revenue contributes marginally in the short run and only explains around 3 percent of output volatility in the long run.

Figure 5: Impulse Responses of Government Expenditure, Revenue and Terms of Trade

Response of G Exp. to a G Exp. Shock

Response of G Exp. to a Tax Rev. Shock

Response of G Exp. to a TOT Shock

Response of GDP to a G Exp. Shock

Response of GDP to a Tax Rev. Shock

Response of GDP to a TOT Shock

Response of Tax Rev. to a G Exp. Shock

Response of Tax Rev. to a Tax Rev. Shock

Response of Tax Rev. to a TOT Shock

Response of Prices to a G Exp. Shock

Response of Prices to a Tax Rev. Shock

Response of Prices to a TOT Shock

Response of Discount Rate to a G Exp. Shock

Response of Discount Rate to a Tax Rev. Shock

Response of Discount Rate to a TOT Shock

Source: Author's Calculations

19.   **Similarly, favorable terms of trade shocks have a positive but modest effect on real output, although it has an adverse effect on private consumption.** Relative to the effect of fiscal shocks, the effect on output is similar (around 0.10% in the long-run). Positive terms of trade shocks affect output through an improvement in the external current account. The effect on consumption is negative and large, with long-term elasticity around -0.2 (Figure 6). The fall in consumption and government spending leads to a weaker demand for imported goods even though they are relatively cheaper (in absolute terms if the increase in hydrocarbons exports tends to appreciate the currency). Positive terms of trade shocks in Bolivia are generally associated with higher energy and commodity prices and benefits hydrocarbons' exports. On the other hand, nonhydrocarbon exports, which are labor intensive, may also be negatively affected by the pressure for the exchange rate to appreciate when energy and commodity prices are high, negatively affecting income and hence consumption. Further evidence of the negative correlation between consumption and the terms of trade is presented in Figure 7 (correlation of -0.72).

Figure 6: Impulse Response to a Terms of Trade Shock

Response of G Cons. to a TOT Shock

Response of Priv. Cons. to a TOT Shock

Response of Investment to a TOT Shock

Response of Exports to a TOT Shock

Response of Imports to a TOT Shock

Source: Author's Calculations

Figure 7: Consumption and the Terms of Trade

Consumption (in per capita growth rate)

Terms of Trade (growth rate)
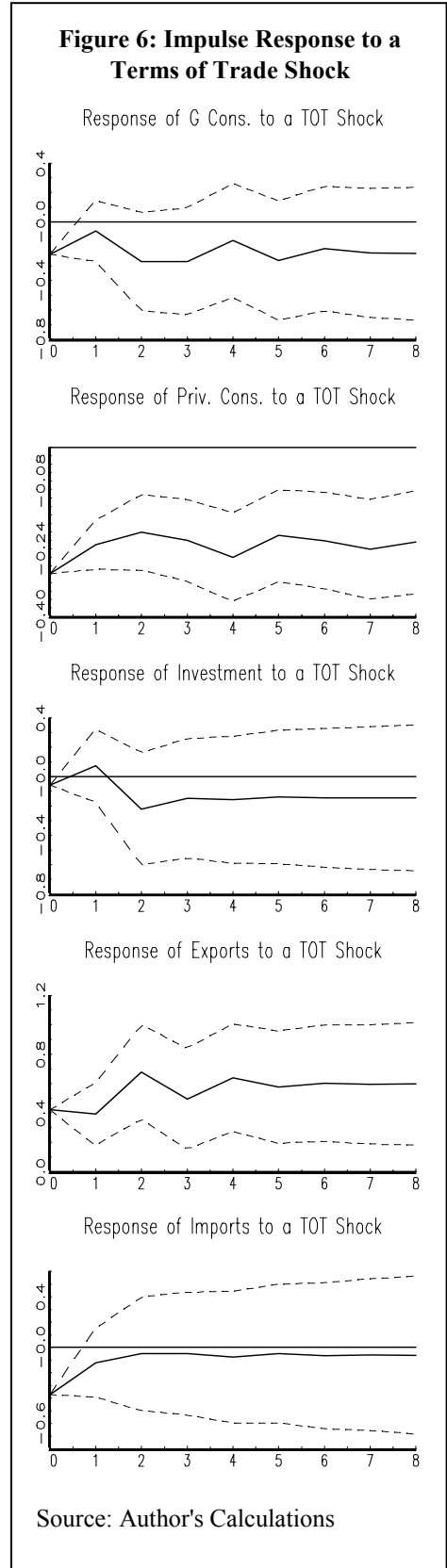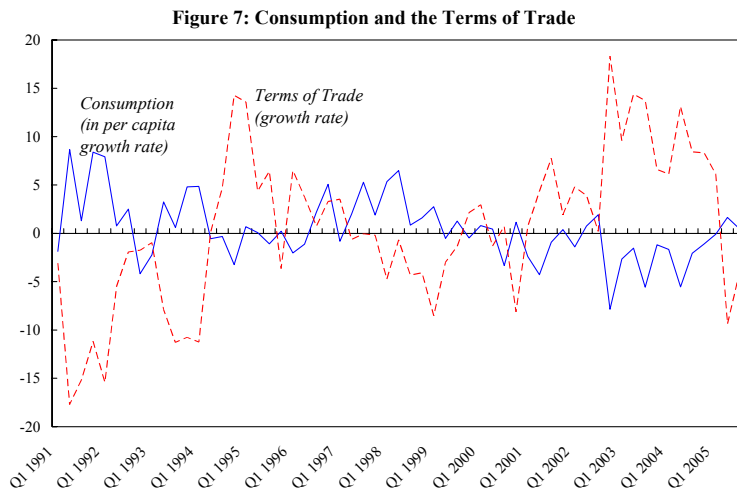
The role of institutions

20.   **Structural reforms in Bolivia have been mainly in areas of trade reform, financial sector reform, and privatization**. However, even in these areas, the *impact* of the reforms is subject to debate. First, as the EPA (2005) notes, while the financial sector was reformed substantially—for example with new banking and central bank laws establishing minimum provisions for a modern banking system—the financial system still remains highly vulnerable, as the level of dollarization remains extremely high. Second, although Bolivia has gone through an extensive privatization program, it is not clear that the business environment has improved much. While the privatization/capitalization scheme did have some successes, such as significantly increased investment and improved access to electricity and telephone connections, the cost of doing business in Bolivia remain remarkably high. The World Bank's "doing business" indicators suggest that the current cost of starting a business in the formal sector is *triple* the average in other LAC countries and over *20 times* the OECD average. Across all 155 countries sampled in 2005, Bolivia is ranked in the bottom third in terms of the overall cost of doing business. This is reflected in one of the highest shares of informal activity in the world, with employment survey data suggesting that over 60 of employment is in the informal sector.

21.   **The absence of broader reforms has been detrimental to the development of institutions that constitute what has been defined as essential "social infrastructure."** Hall and Jones (1999) argue that adequate social infrastructure— defined as the institutions and government policies that determine the economic environment within which individuals accumulate skills and firms accumulate capital and produce output—is an essential determinant of output per capita. Part of their measure of social infrastructure is an index of government *antidiversion policies* (GADP), based on data assembled by Political Risk Services, an organization that specializes in providing risk assessments to international investors.[13] As Figure 8 shows, the GADP measure for Bolivia improved significantly from the crisis of the 1980s to the mid-1990s, by which time it had overtaken the South American average. Since then, the index has declined, and at end-September 2005 it stood below the South American average. However, the improvement in the aggregate index in the 1990s masked some disturbing trends. In particular, it was mainly driven by improvements in the investment profile subindex, as perceptions of the risk of government repudiation of contracts declined. This has since been reversed. Moreover, the sub-indexes for corruption, law and order and bureaucratic quality only improved marginally, and from very low bases.

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[13] The GADP measure averages five categories. Two of the categories relate to the government's role in protecting against private diversion: law and order; and bureaucratic quality. Three categories relate to the government's role as a diverter: corruption; risk of expropriation; and government repudiation of contracts.

Figure 8. Bolivia: GADP measure of Social Infrastructure
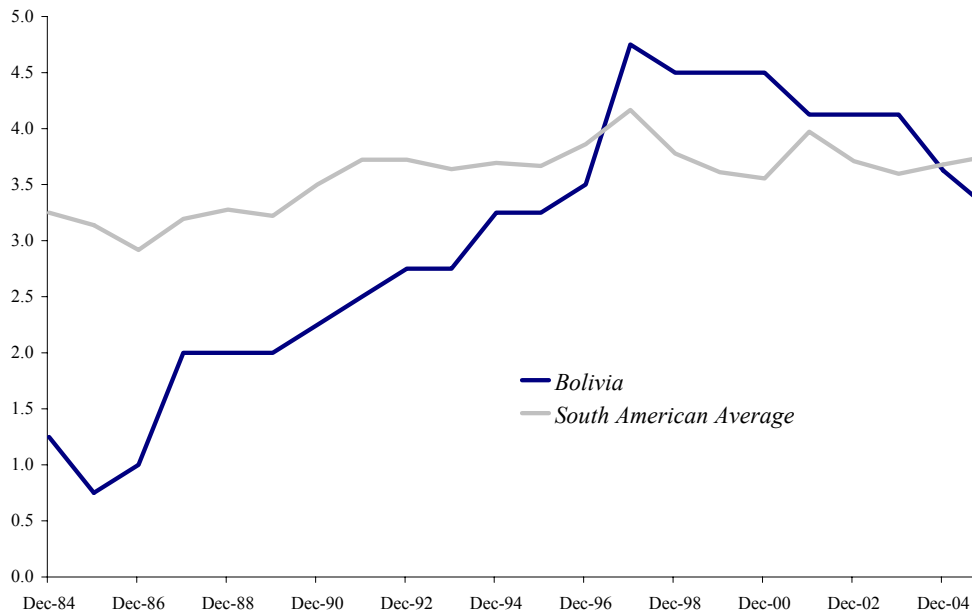
22. **A lack of progress on some key elements of social infrastructure is also apparent from indicators of governance.** Since 1996, Bolivia's governance, according to the indicators of Kaufmann, Kraay and Mastruzzi[14] (2005) have declined across four of the six dimensions measured (Figure 9). By 2004, in all areas sampled except regulatory quality, Bolivia was below the average for South America and, indeed, ranked in the bottom half of all countries sampled. Political stability and corruption rankings place Bolivia in the bottom third of the sample.

23. **Competitiveness indicators also show significant room for improvement.** The World Economic Forum produces two indices, the growth competitiveness indicator (GCI) based on quantitative and qualitative macroeconomic factors that determine growth, and the business competitiveness indicator (BCI) based on the underlying microeconomic factors that determine the level of productivity and competitiveness. The GCI measures educational levels, macroeconomic performance, and the penetration of new technologies, combining these with survey data on judicial independence, institutionalized corruption, and inefficient government intervention. The BCI measures the sophistication of company operations as well as the quality of the national business environment in which they operate. Bolivia ranks very low in both indicators in 2005—101 out of 117 countries in the GCI and 113 out of 116 countries in the BCI.

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[14] These indicators are based on several hundred variables measuring perceptions of governance across nearly 200 countries. Six aggregate governance indicators are constructed, covering: voice and accountability; political stability; government effectiveness, regulatory quality, the rule of law; and corruption.

Figure 9. Bolivia: Governance Indicators
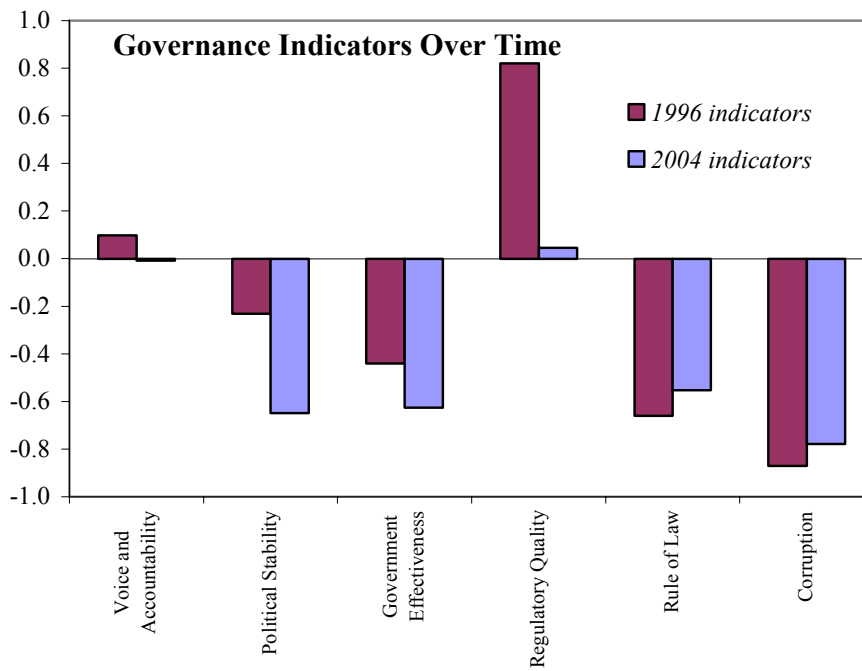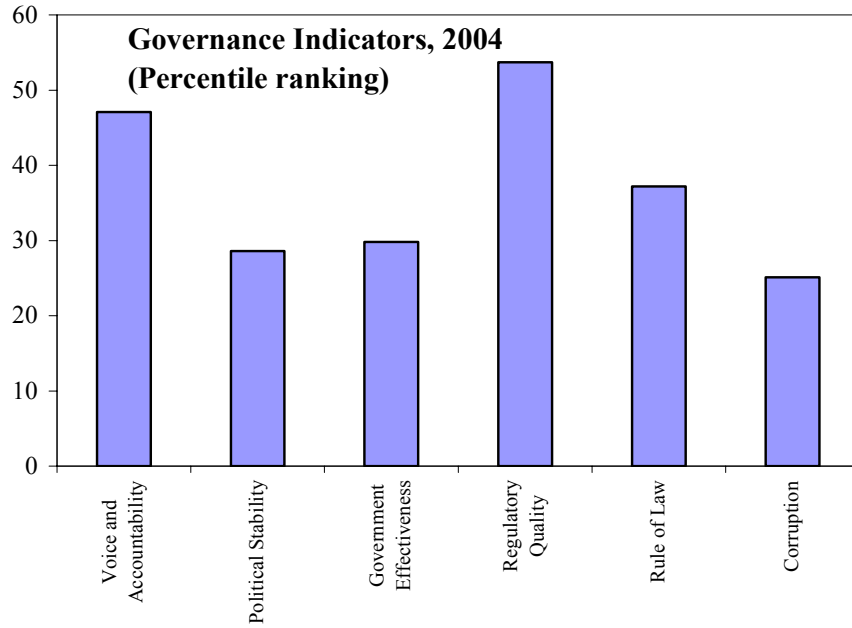
Source: World Bank Governance Indicators (by Kaufmann, Kraay, and Mastruzzi)

C. Main Conclusions

24.   **Growth in Bolivia has been disappointing over the last forty years, even when compared to the rest of Latin America.** With higher than average population growth rates, this has led to increasing divergence in its per capita income from the rest of Latin America.

25.   **High output volatility and weaknesses in key institutions are important detrimental factors.** Fiscal policy shocks appear to account for most output volatility in the short run, while terms of trade shocks have been more important in the long run. Major reforms since the mid-1980s have not sufficiently improved the social infrastructure to increase trend growth per capita. As noted by the EPA, "the successive structural reforms did not succeed in fundamentally altering the character of the state and improving the business environment, which is hampered by governance problems, corruption, poor infrastructure, and high costs of operating in the formal sector."

26.   **Thus, reducing output volatility and improving social infrastructure will help sustain poverty reduction by increasing growth**. While the impact of terms of trade shocks is difficult to smooth out for a small open economy such as Bolivia, avoiding fiscal policy shocks—particularly spending shocks—and promoting improvement in governance should largely be in the hands of the authorities. The former would help to reduce output volatility and enhance growth through a more predictable macroeconomic environment.

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APPENDIX I. METHODOLOGY AND ASSUMPTIONS FOR GROWTH ACCOUNTING EXERCISE

A basic growth accounting formulation is used. The aggregate production function is given by:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}$$

where real output, Y_t, is a Cobb-Douglas function of capital, K_t, labor, L_t, and total factor productivity (TFP), A_t. Under the assumption of perfect competition, the parameter α measures the share of capital in output. Since growth rates can be computed as (natural) log-differences, then:

$$\log Y_t - \log Y_{t-1} = \log A_t - \log A_{t-1} + \alpha(\log K_t - \log K_{t-1}) + (1-\alpha)(\log L_t - \log L_{t-1})$$

Thus, the growth rate of real output equals the growth rate of TFP, plus the growth rate of the factors of production weighted by their share in output. Since only output, capital and labor are observed, TFP is obtained as a residual.

The share of capital in output is assumed to be 40 percent, fixed over time, and the same for all countries. The value is in line with several cross country studies, such as Easterly and Levine (2001), but is somewhat lower than would be obtained from national accounts data. However, as noted by Gollin (2002), in many developing countries employee compensation does not usually include workers who are self-employed or are outside the corporate sector. Thus, the capital share in output is typically overestimated.[15]

Labor input is measured by the total labor force. Other cruder measures of labor input used in the growth accounting literature are total population and total working age population. In contrast, more sophisticated alternatives use employment and hours worked. The choice in this chapter was mainly driven by data availability across the time period sample of countries used.

Estimates of the capital stock for each country are constructed using the perpetual inventory method. With data on investment, an initial capital stock, and a depreciation rate, a series for K_t is constructed by using:

$$K_t = K_{t-1}(1-\delta) + I_t$$

where δ is the rate of depreciation. Following McGrattan and Schmitz (1998), and De Gregorio (2004), a depreciation rate of 6 percent is used. The higher the rate of depreciation assumed, the lower the capital stock growth rate and, as a result, the lower the contribution of capital to growth.

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[15] Indeed, by using uniform accounting procedures, the capital share in output in developing countries is approximately in line with that of the developed world (i.e., around 40 percent).

The initial capital-output ratio is assumed to equal the steady state capital-output ratio to avoid biasing the contribution of capital. Choosing an initial capital-output ratio below the steady state ratio would imply higher capital growth rates to reach the same steady state and therefore, a higher long run contribution of capital. Exactly the opposite would result by choosing an initial capital-output ratio above the steady state ratio.

The omission of factor utilization measures might distort the results of the growth accounting exercise over short time periods. When a country enters a recession, both labor and capital become less than fully employed. The standard growth accounting methodology will misleadingly assign the slowdown in output growth to TFP. Over longer periods of time, such as decades, cyclical considerations are less important and thus such biases would diminish.[16]

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[16] In this respect, it should be noted that the high correlation between overall growth and TFP growth does not disappear when we consider 1991-2002 as a whole.

APPENDIX II — METHODOLOGY AND ASSUMPTIONS FOR ESTIMATING FISCAL AND TERMS OF TRADE SHOCKS

The relationship between economic activity and fiscal policy is analyzed identifying fiscal shocks using structural VARs. Following Blanchard and Perotti (1999), Gracia (mimeo) uses a structural VAR to identify fiscal shocks (to both revenue and expenditure) by exploiting decision lags in fiscal policy and information about the elasticity of fiscal variables to economic activity. The importance of primary commodities, -hydrocarbons in particular- on their exports suggests that external shocks to the terms of trade may also contribute significantly to economic volatility. Since Bolivia is a small open economy and the price of these commodities is set in international markets, i.e. they are exogenous, identifying these shocks does not add much complexity.

For tax shocks to be identified, the autonomous shifts in average tax rates need to be separated from the endogenous responses of taxes to the state of the economy. Consider a three variable VAR, that includes tax revenue, t_t, government spending, g_t, and GDP, y_t. Let Z_t denote the vector of endogenous variables and U_t the vector of reduced form (or observed) residuals. Then, the reduced form VAR can be written as,

$$Z_t = A(L)Z_{t-1} + U_t$$

where, $Z_t \equiv [t_t, g_t, y_t]$ and $U_t \equiv [u_t^t, u_t^g, u_t^y]$.

The reduced form residuals of the t_t and g_t equations, u_t^t and u_t^g, are the sum of the automatic and discretionary shocks to government spending and tax revenue respectively. Tax revenue and government spending react automatically to shocks in other endogenous variables and can also be changed discretionarily by policymakers. Thus, the reduced form residuals can be written as,

$$u_t^t = \alpha^{t,y} u_t^y + \beta^{t,g} e_t^g + e_t^t$$
$$u_t^g = \alpha^{g,y} u_t^y + \beta^{g,t} e_t^t + e_t^g$$
$$u_t^y = \alpha^{y,t} u_t^t + \alpha^{y,g} u_t^g + e_t^y$$

where $[e_t^t, e_t^g, e_t^y]$ are the mutually uncorrelated structural shocks.

Identification is possible after realizing that it takes longer than a quarter to decide discretionary changes in fiscal policy. Thus, using quarterly data, the coefficients, $\alpha^{t,y}$ and $\alpha^{g,y}$, reflect only the automatic responses of fiscal variables to economic activity and, as a consequence e_t^t and e_t^g are the discretionary components of the fiscal policy reduced form residuals. To construct $\alpha^{t,y}$ and $\alpha^{g,y}$, the elasticity of tax revenue and government spending with respect to output must be estimated.

With $\alpha^{t,y}$ and $\alpha^{g,y}$ the cyclically adjusted reduced form tax and spending residuals can be constructed,

$$u_t^{t,CA} \equiv u_t^t - \alpha^{t,y} u_t^y$$
$$u_t^{g,CA} \equiv u_t^g - \alpha^{g,y} u_t^y$$

These may still be mutually correlated but they are uncorrelated with e_t^y and can, therefore, be used as instruments to estimate $\alpha^{y,t}$ and $\alpha^{y,g}$ in a regression of u_t^y on u_t^t and u_t^g.

Tax decisions are assumed to come before spending decisions, $\beta^{t,g} = 0$, allowing $\beta^{g,t}$ to be estimated. Finally, the value of $\alpha^{g,y}$ is assumed to be zero as no automatic feedback can generally be identified from economic activity to government purchases within a quarter. Thus, we are left with the following system,

$$\begin{pmatrix} 1 & 0 & -\alpha^{t,y} \\ 0 & 1 & -\alpha^{g,y} \\ -\alpha^{y,t} & -\alpha^{y,g} & 1 \end{pmatrix} \begin{pmatrix} u_t^t \\ u_t^g \\ u_t^y \end{pmatrix} = \begin{pmatrix} 1 & \beta^{t,g} & 0 \\ \beta^{g,t} & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} e_t^t \\ e_t^g \\ e_t^y \end{pmatrix}$$

Since Bolivia is a small-open-economy, the terms of trade can realistically be considered as exogenous. As the price of petroleum and gas are set in international markets, and the economic performance of developed nations or the state of the global financial markets are unlikely to be affected by events occurring in Bolivia, this assumption should not be controversial making the identification of terms of trade shocks relatively simple.

II. THE HYDROCARBONS SECTOR[1]

1.   **Bolivia began developing its natural gas reserves and producing natural gas in the late 1960s**. Export volumes became significant in the early 1970s after export agreements with Argentina were activated.

2.   **Over the last ten years, the hydrocarbons sector has become one of the most dynamic economic activities in the Bolivian economy and one of the main drivers of the improved performance in terms of exports and reserve accumulation**. Hydrocarbons represent about 7 percent of the GDP and are now Bolivia's main export (about US$1.3 billion in 2005 (half of total exports)—of which natural gas accounted for about 75 percent in 2005). Hydrocarbons contribute with almost one-third (9 percent of GDP) of government revenue. However, production is highly capital-intensive, hydrocarbons account directly for only a minor share (about 0.2 percent) of total employment.

3.   **The hydrocarbons sector has been transformed, since the mid-1990s, by major foreign investment that has contributed to major increases in reserves and production of natural gas**. In the context of the capitalization and privatization process (see Box 2 of the staff report), the role of the public sector was refocused from direct ownership into regulation of downstream activities and partnership with private investors. At present, those reforms are being partially reversed and it is expected that the state oil company Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) will regain a pivotal role. This will bring new challenges to the development of the sector over the medium term, especially because further development will require significant additional investments.

4.   **This paper discusses the evolution of the hydrocarbons sector, its importance in the economy, and the recent reforms**. Section A describes the main institutional changes in the past decade; Section B discusses production and marketing; and Section C provides the highlights of the ongoing nationalization process.

A. Reforms of the 1990s

5.   **In the early 1990s, it became evident that the government was unable to meet the financing requirements for developing the hydrocarbons sector**. The deep debt crisis and the hyperinflation episode of the 1980s had left the capacity of the government to finance risky exploration activities significantly reduced. In particular, the priority was to correct severe macroeconomic imbalances and improve the provision of other public services.

6.   **In 1994, the Capitalization Law established the framework for the privatization of state-owned companies, including YPFB, until then the main player in the sector**. Although YPFB represented one of the main sources of government income, its production

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[1] Prepared by Mario Mansilla, with comments from staff of the Unidad de Análisis de Políticas Sociales y Económicas.

was modest, the company remained undercapitalized and its capacity to invest very limited.[2]
In addition, the total government take from the sector was decreasing as percentage of the
GDP, from 8 percent in 1990 to less than 6 percent in the middle of the decade. To
implement the privatization/capitalization, YPFB was divided into several business units:
two upstream units, two transport units, and two refining units. The upstream and
transportation units were privatized in 1996–97—giving rise to Petrolera Chaco and
Petrolera Andina in upstream activities, and Transredes and Compañía Logística de
Hidrocarburos Boliviana in transportation and distribution. The scheme allowed the
effective transfer of management and significant shareholding stakes to private companies
in exchange for investment commitments (which is why it is termed "capitalization"). The
auctions were won by three groups of companies, from the United States and Argentina.
The refining units were later sold to the Brazilian state-controlled company Petrobrás and
the logistics company to a consortium of German and Peruvian investors. Thus, as a result
of the privatization/capitalization process, most activities related to the hydrocarbons sector
were transferred to foreign energy companies.

7.   **In the hydrocarbons sector, the Capitalization Law was complemented in 1996
by a new Hydrocarbons Law**. That law established the responsibilities of the newly
created Superintendency of Hidrocarbons and the regulatory mechanisms governing exports
and the domestic market. The role of YPFB was also redefined, enabling it to participate in
joint venture projects with other parties, national or foreign, in all the stages of
hydrocarbons production. The state retained its role in wholesale marketing activities.

8.   **Along with the changes in the institutional setup, the new law established new
tax incentives for investment in both upstream and downstream activities**. Regarding
upstream activities, new hydrocarbons projects (that is, in fields that were not in production
at the time of the law) would now pay royalties of only 18 percent of the value of gross
production, compared with the royalties of 50 percent paid by existing fields. At the same
time, in the context of a wider tax reform, the net income tax rate was reduced from
40 percent to 25 percent, while new taxes of 12.5 percent on dividend repatriation and
extraordinary net income were introduced. Other provisions included profit repatriation
guarantees and acceptance of international arbitration.

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[2] In 1994 Bolivia produced only 572 thousand cubic feet of natural gas and its annual investment (including
exploration) was around US$60 million.

Foreign Direct Investment by Sectors
(In millions of US dollars)
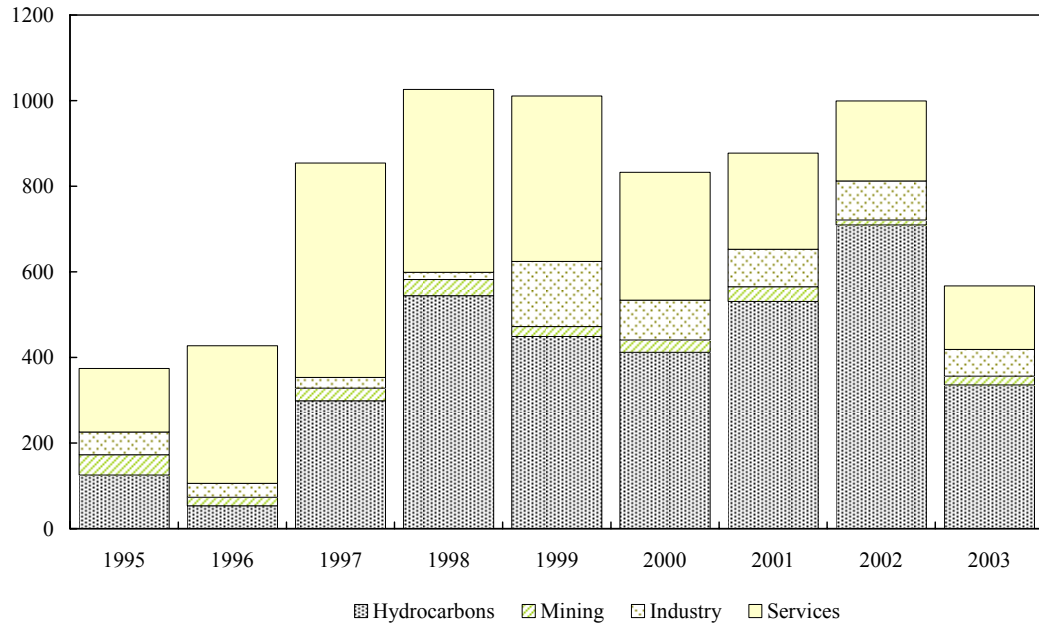
9.   **The reduction of the government take and the new legal framework led to a major increase in investment in the hydrocarbons secto**r. Between 1997 and 2005, foreign direct investment exceeded US$4 billion, outpacing all other sectors and reaching almost 10 percent of the GDP. This was mainly oriented to export projects to Brazil, the main market in the region.

Investments in the Hydrocarbons Sector
(In millions of U.S. dollars)
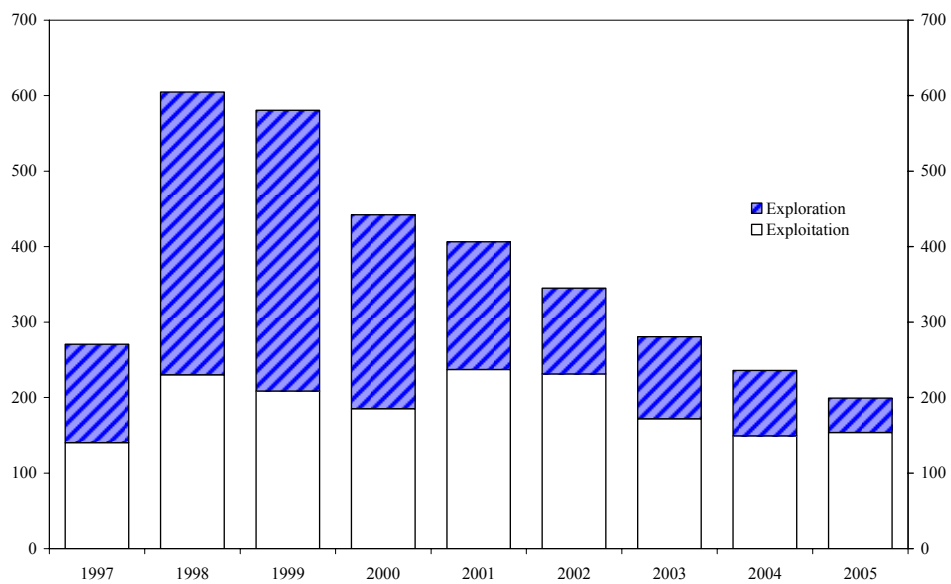
10.   **Investments in exploration increased seven-fold the total natural gas reserves in Bolivia**. The main drilling discoveries were conducted by Total Fina Elf in Tarija, Repsol–YPF in the Caipipendi block, and Petrobras in San Antonio and San Alberto. According to the International Energy Agency, Bolivia became the country with the highest nonassociated gas reserves in the region.[3]
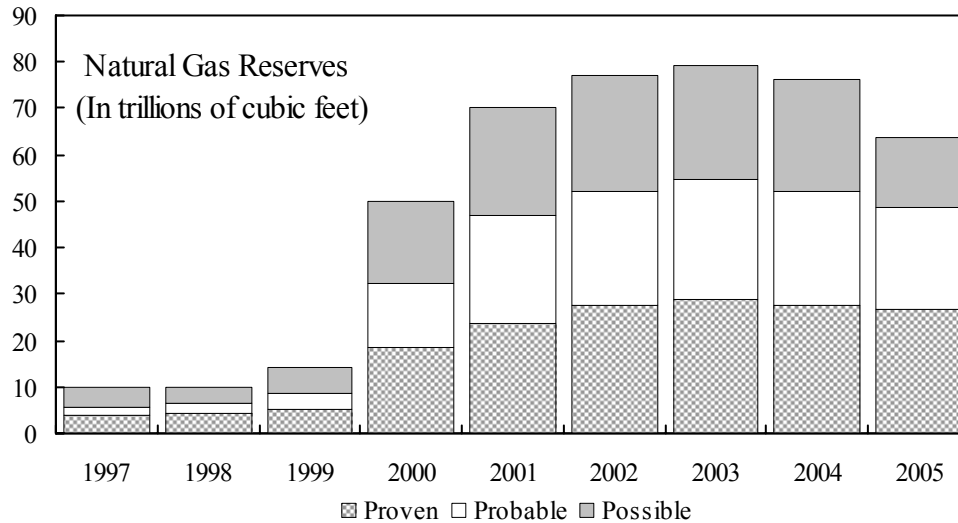
B. Production and Markets

11.   **Despite the existence of significant reserves, the production capacity of natural gas in Bolivia is close to full utilization and will therefore constrain increases in exports over the medium term, unless significant additional investments are carried out**. The current capacity of production is approximately 37 million of cubic meters per day. Of this total, about 24 million are exported to Brazil and 6 million to Argentina, while the domestic market consumes 5 million of cubic meters per day. Any project oriented to increase production capacity would also require transportation-related investments.

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[3] Although Venezuela has almost 60 percent of the region's reserves, only about half of their reservoirs have nonassociated or free gas, while Bolivian reserves are mostly of free gas. Free gas reservoirs are more efficient to exploit than those with associated gas because the complex logistics of producing liquid and gas fuels increases the overall costs.

Box 1. Key Technical Aspects of the Production of Natural Gas

Differently from other fuels, natural gas cannot be easily stored and its economic utilization requires that producers and consumers be tightly connected. The main technologies available to transport gas are pipelines (used in Bolivia) and shipment in the form of liquid natural gas (LNG). LNG projects involve a cryogenic process that liquefies natural gas at the shipping port. Depending on the distances involved, cryogenic plants are more efficient than pipelines.[1] The relatively new gas-to-liquid (GTL) technique that transforms natural gas into diesel might become an alternative to LNG and diesel fuel in the future, but its economic viability depend on the scale of specific projects.

On average, transportation costs of gas are about 50 percent of the final price to the consumer, compared with 5–10 percent for crude oil. Since the upfront investment needed to develop gas fields is high, it is not economical to target small–scale gas markets. Thus, gas trade is conducted mainly on a regional scale and most investments in gas production can only proceed if there are large consumption commitments, which justify the cost of putting in place distribution networks and export infrastructure.

Natural gas projects are vulnerable to the availability of close substitutes. Natural gas projects for residential use compete with electricity, heating oil, and liquid petroleum gas. Those for industrial uses compete with coal and oil, and those in electricity generation with coal, oil, nuclear energy, hydropower, and a range of renewable energy alternatives. Since most of those substitutes are economically viable, pricing policy decisions are key for the successful development of natural gas markets.

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[1]Pipelines tend to be economically efficient for distances up to 3,000 kilometers.

Export markets

12. **The main export market for Bolivia's natural gas at present is Brazil, which imports 70 percent of its natural gas production, equivalent to 30 percent of Bolivia's merchandise exports in 2005**. Culminating long negotiations that had started in the 1970s, Bolivia signed in 1992 an agreement of energy complementarity with Brazil, which provided the framework for investments in the sector because of the prospects to export to Brazil. This agreement, combined with the privatization process described above, led to the construction of a gas pipeline in the mid-1990s to transport gas from Santa Cruz to São Paulo, at an estimated cost of about US$2 billion. The Bolivia-Brazil pipeline is the longest in the region, spanning over more than 3,000 kilometers.

Box 2. Natural Gas Trade in the South American Region

Energy trade, and in particular natural gas trade, in the region is heavily determined by geography, the abundant endowment of individual countries, and the high potential for domestic consumption and associated demand from their neighbors. The demand growth for gas-generated electricity in South America is mainly driven by Brazil and Chile. Since these countries do not have sufficient or conveniently located reserves, their natural suppliers are Bolivia and Argentina.

Natural gas penetration is generally low in the main producing countries (Bolivia, Peru and Venezuela) while the high-demand countries are net importers (Brazil, Chile, and Argentina). Demand for natural gas is expected to be driven, in the foreseeable future, mainly by electricity generation uses. This trend benefits from the lower upfront costs of the gas-fired technology compared to other technologies, shorter lead times for investment, high efficiency and flexibility, and lower environmental impact because gas burns more cleanly than other fossil fuels. Natural gas is also a way of diversifying the power generation mix in the region, still heavily dependent on hydroelectric generation. Factors influencing this pattern include the local availability of alternative fuels, the relative costs, and the promotion of greater gas use based on environmental policies.

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13.   **Natural gas exports to Brazil started in 1999 under a 20-year contract which established a maximum of 30 million of cubic meters/day**. Thus far, the maximum volume has not been reached mainly due to slower-than-expected development of the gas market in Brazil, but that limitation is anticipated to be overcome over time. The contract with Brazil has a deliver-or-pay feature for a volume of 24 million cubic meters per day—so that, if the maximum quota is not reached, it allows Brazil to accumulate rights to buy the difference in the future at a mutually agreed date. The main uses of Bolivian natural gas in Brazil are in electricity generation, in transportation, and in the ceramic industry.

14.   **Under the long-term contract, the pricing of Bolivian gas exported to Brazil is based on the cost of a basket of alternative fuels, which is adjusted periodically (Appendix II)**. Under the contractual rules, the gas export price increased gradually, from US$1.7 to US$3.9 per thousand cubic feet since 2001. Still, the Bolivian authorities consider that these prices are misaligned, especially in view of current energy prices and reference prices of gas in other regions (see table below), and intend to renegotiate the contract as part of their overall discussions in the framework of the nationalization process (see below).

Bolivia: Natural Gas Export Volumes and Prices 2001-2006

	2001	2002	2003	2004	2005	Proj. 2006
Brazil						
Volume (MCM per day)	10.1	10.3	13.8	19.5	22.4	24.0
Price ($/MCF)	1.7	1.5	2.0	2.2	2.8	3.7
Percent change	6.6	-11.0	30.6	6.7	27.8	35.7
Argentina						
Volume (MCM per day)	...	...	...	2.2	4.8	6.3
Price ($/MCF)	...	...	...	1.7	2.7	3.1
Percent change	...	...	...	...	52.5	16.3
Memorandum items:						
WEO natural gas price index (percent change)	-1.2	-19.0	31.5	11.1	42.0	4.9
Other reference prices ($/MCF) 1/						
Henry Hub (Lousiana)						
Average	3.6	3.5	5.7	6.1	9.2	6.1
Percent change	-20.5	-3.6	62.7	6.9	51.3	...
End of the year	2.8	4.7	5.9	6.1	9.7	...
Northeast (New York Hub)						
Average	4.0	3.9	6.5	6.7	9.9	6.7
Percent change	-24.0	-2.7	66.2	2.4	49.0	...
End of the year	3.9	5.4	6.3	6.7	10.3	...
Alberta, Canada						
Average	3.2	2.7	4.8	5.2	7.5	5.1
Percent change	-19.6	-16.5	80.2	8.5	42.1	...
End of the year	2.4	3.9	4.8	5.3	8.4	...

Sources: Bolivian authorities; Bloomberg; and Fund Staff estimates.

1/ The prices for 2006 correspond to May.

Natural Gas Sales Volume
(Billions of Cubic Feet per year)

☒ External Market
■ Internal Market
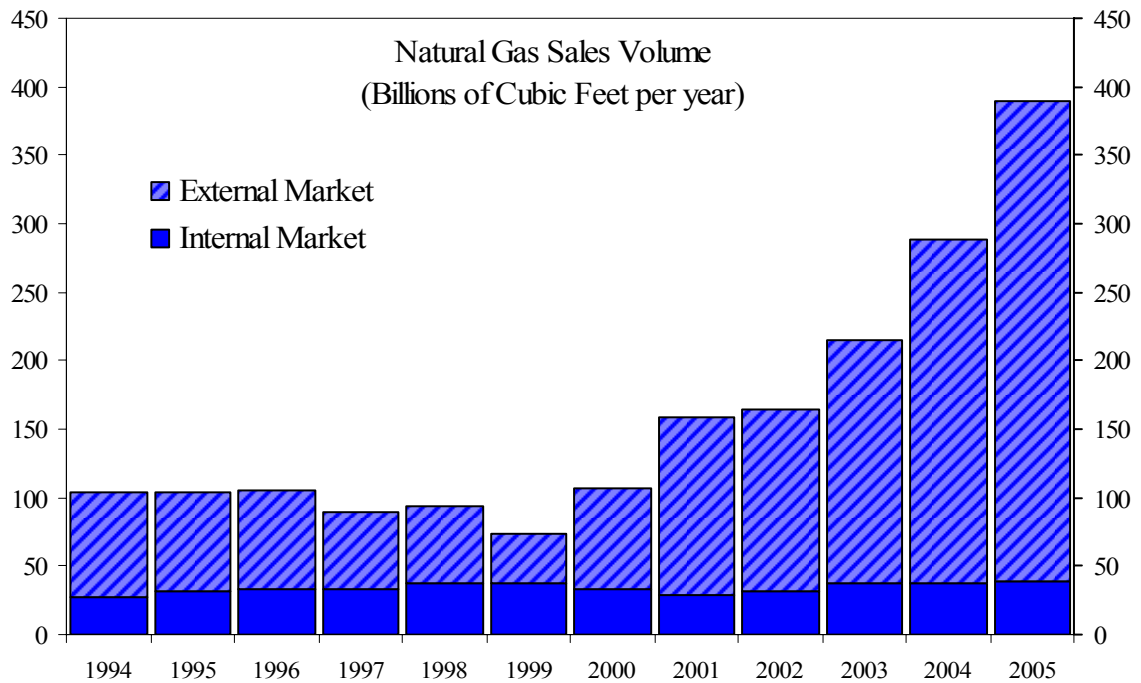
15.   **Exports to Argentina represented 14 percent of total gas production in 2005 (close to 5 million of cubic meters per day)**. They are governed by a contract that is revised annually, which stipulates a maximum volume of 7.5 million of cubic meters per day but has no pre-determined minimum. New potential markets in the region include Chile, either in the form of gas or electricity for the Northern region, and to a lesser extent Paraguay, but these markets remain undeveloped at present. Export contracts are negotiated yearly, and the price is fixed during each period based on the demand and expected availability of gas.

The domestic market for natural gas

16.   **Energy consumption in Bolivia is very low due to the country's relatively undeveloped productive base and small population**. Bolivia's per capita energy and electricity consumption are roughly one-half and less than one-fourth of the averages for South America. This is due to the limited coverage of the electricity network, since about three-fourths of rural households and one-fifth of urban households do not have access to electricity.

17.   **However, in recent years the domestic use of natural gas has increased to about 15 percent of total production, mainly for power generation**. Compared to the rest of South America, the power generation mix in Bolivia is now relatively tilted towards the use of natural gas as gas-based electricity production now represents about 45 percent of total electricity production. Use of natural gas for residential use corresponds to only about 3 percent of total gas production.

<div style="border:1px solid">

Gas Production, Exports and Consumption
2005
(In Millions of Cubic Feet)

Production By Company		Exports		Domestic Market	
● Andina	167.0				
● British Gas	60.2				
● Chaco	108.7	**To Brazil:**		● Network Gas Distributors	62.0
		- By San Matías (GOB): 23.6		● Refineries	8.4
● Maxus	61.6	- By Mutún (GTB): 801.2			
● Petrobras	698.6			● Electric Generation	77.0
		Others		● Direct Consumption	4.4
● Petrobras Energia	34.3	11.93			
		To Argentina:		● Own Consumption	18.0
● Pluspetrol	23.9	- By Madrejones: 22.0			
		- By Pocitos: 143.8		● Venting	0.1
● Vintage	18.2				
Total Production:	**1,172.4**	**Total Exports:**	**990.6**	**Total Domestic Consumption:**	**169.9**

</div>

Sources: Transredes, Y.P.F.B., GTB, J.V. Chaco/Andina, Pluspetrol, GOB, Oro Negro, Reficruz, Chaco, Transierra and Transportadora San Marcos

18.   **There is a potential for use of natural gas in new industrial activities, for instance in the petrochemical sector**. Given the large scales of production needed in most cases, viability might hinge on the scope for servicing the regional market. Provided the necessary conditions are met, production of methane, ammonia, and hydrogen, would be possible new sources of exports and inputs for domestic industries. Another possible use of gas is in transportation, in the form of compressed natural gas, an application that has had growing acceptance in the region but is still incipient in Bolivia.

19.   **Given the level of existing reserves and the limited domestic market size, the development of new external markets would appear to be an essential component of the strategy for the sector**. Bolivia's reserve-to-production ratio remains well above the average in South America (162 years versus 57 years in 2002, respectively), reflecting a faster increase in proven reserves than in production since the reforms of the 1990s. While this suggests a massive potential for growth and development in the sector.[4] Success will

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[4] According to estimates, if gas consumption in Bolivia reached penetration levels similar to other gas-producing economies in the region, and it if doubled in the next ten years, exploitation of existing reserves under prudent reserve/production ratios would still leave about 40 billion of cubic meters per year available for exports.

require appropriate planning, and a significant level of investment in maintenance, production,[5] and transportation—hence, maintenance of conditions that retain and attract investors.

C. The Nationalization of Hydrocarbons

20.   **Despite their success in terms of investment and export performance, the political support for hydrocarbons reforms of the 1990s eroded sharply in recent years**. The growing opposition led to a national referendum in mid-2004, which indicated widespread public support for nationalization. A new hydrocarbons law was enacted in May 2005, which was broadly in line with the results of the referendum. The key elements of the new law were: (i) taxes on production (royalties and a direct hydrocarbons tax,), were raised to 50 percent;[6] (ii) the role of the state energy company, YPFB, was restored into that of a more active market participant that would also intermediate all contracts to export natural gas and become the only importer and wholesale distributor of fuel products; and (iii) existing contracts for hydrocarbons production would be renegotiated for compliance with the new law.

21.   **On May 1, 2006 the government issued a decree implementing the new hydrocarbons law, which reverses the privatization process of the 1990s in the sector**. The decree established that the private oil companies (Andina and Chaco) would return to government control through the reallocation to YPFB of the shares previously given in trust to private managers to generate a retirement pension supplement for all Bolivians at least 21 years old at end-1995;[7] and the acquisition of the necessary shares to reach the 50 percent plus one share necessary for company control. In addition, other companies in the sector's downstream (Transredes, the two Petrobrás refineries, and Compañía Logística de Hidrocarburos Boliviana) would also become state-owned through the mandatory sale of 50 percent plus one share to the government. In terms of the participation of the nationalized companies in the total production and reserves, and given Andina's participation in the ownership of the two mega fields, the decree leads to a direct and indirect government control of 81 percent of total gas production and 56 percent of gas reserves (Appendix I). The nationalization decree also established that YPFB would become again the main player in the sector, which includes regulation of prices and production volumes, as well as the terms of exports and distribution.

22.   **The nationalization decree established a six month period (May 1–October 31, 2006) for the negotiation of new hydrocarbons production contracts—a provision of the May 2005 law that had not yet been implemented.** During this negotiation period, the

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[5] The cost of drilling a natural gas well is in the range of US$20-30 million, and the investment needed to maintain production levels in the next few years would be around US$80 million per year.

[6] The regime provided for a more favorable treatment of smaller (less profitable) fields, but this has not yet been regulated.

[7] This provision has already been implemented.

companies operating the two main natural gas fields (San Alberto and San Antonio) are required to pay an extra amount of 32 percent of the value of production to YPFB, raising the overall state take from royalties, direct taxation to hydrocarbons (IDH), and the extra amount to 82 percent. During this period, the take from other companies will remain at 50 percent, as in the May 2005 law.

23. **High-level negotiating commissions have been designated by Bolivia and Brazil with a view to implementing the nationalization decree.** Discussions are expected to cover, inter alia, possible payments for the nationalized assets, and a revision in the price of natural gas exports to Brazil. With respect to the possible compensation, the government is conducting audits in all the projects involved in order to determine if the companies complied with their investment commitments, to assess the value of the nationalized assets, and possibly to establish new participation levels. Simultaneously, there are talks with Argentinean authorities to revise the terms of gas exports to that country.

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Appendix I. Impact of the Nationalization Decree on the Bolivian Natural Gas Sector

1. Direct effect: Privatized companies returning to state control

Company	Partners - Country	Share	Fields	Production (MCFD) 1/	% Total	Reserves (MCF) 2/	% Total
Andina	Repsol YPF - Spain	29.8%	Arroyo Negro	0.01	0.0%	2,332,095	4.8%
	Pecom Energía S.A. (Pérez Companc) - Argentina	4.8%	Camiri	0.38	0.0%		
	Pluspetrol Bolivia Corporation - Argentina	15.5%	Cascabel	0.01	0.0%		
	AFP Futuro de Bolivia S.A.	23.9%	Guairuy	0.33	0.0%		
	BBVA Previsión AFP S.A.	23.9%	La Peña	1.50	0.1%		
	Ex trabajadores (YPFB) y otros accionistas menores	2.1%	Los Penocos	0.02	0.0%		
			Los Sauces	13.81	1.0%		
			Río Grande	92.14	6.5%		
			Sirari	41.88	2.9%		
			Vibora	68.47	4.8%		
			Yapacaní	36.17	2.5%		
Chaco	Pan American Energy (Amoco Bolivia Oil & Gas) - USA	50.0%	Bulo Bulo	67.99	4.8%	2,390,115	4.9%
	AFP Futuro de Bolivia S.A.	24.5%	Carrasco	19.26	1.4%		
	BBVA Previsión AFP S.A.	24.5%	Carrasco FW	0.03	0.0%		
	Ex trabajadores (YPFB) y otros accionistas menores	1.0%	H. Suárez	0.18	0.0%		
			Kanata	14.15	1.0%		
			Kanata Norte	10.40	0.7%		
			Kanata FW	0.14	0.0%		
			Los Cusis	0.22	0.0%		
			Montecristo	0.22	0.0%		
			Patujusal	0.43	0.0%		
			Patujusal Oeste	0.09	0.0%		
			San Roque	7.39	0.5%		
			Vuelta Grande	83.28	5.9%		
Total direct effect				458.50	32.3%	4,722,210	9.7%

2. Indirect effect: Companies with indirect state control due to majority stake held by nationalized companies

Operator	Partners - Country	Share	Fields	Production (MCFD) 1/	% Total	Reserves (MCF) 2/	% Total
Petrobras Bolivia S.A.	Petrobras Bolivia S.A. - Brazil	35.0%	San Alberto	310.35	21.8%	11,744,381	24.1%
	Total Exploration Production Bolivie - France	15.0%	Sabalo (San Antonio)	380.66	26.8%	10,668,252	21.9%
	Empresa Petrolera Andina S.A. - Repsol YPF - Spain	50.0%					
Total indirect effect				691.01	48.6%	22,412,633	45.9%
Combined effect (1+2)				1,149.51	0.81	27,134,843.00	0.56

3. Companies not affected by the nationalization decree

Operator	Fields			Production (MCFD) 1/	% Total	Reserves (MCF) 2/	% Total
Vintage				18.82	1.3%	1,030,922	2.1%
Repsol YPF				127.70	9.0%	10,681,994	21.9%
Petrobras Energía				37.78	2.7%	698,370	1.4%
Pluspetrol				25.56	1.8%	916,022	1.9%
BG Bolivia				61.14	4.3%	495,194	1.0%
Matpetrol				0.63	0.0%	-	-
Total E & P Bolivie				-	-	7,757,145	15.9%
Canadian Energy				-	-	10,479	0.0%
Dong Won				-	-	52,308	0.1%
				271.63	19.1%	21,642,434	44.4%

4. Total Bolivian Production and Reserves

				1,421.14	100.0%	48,777,277	100.0%

Source: YPFB

1/ Millions of cubic feet per day in 2005
2/ Reserves proven and probable in 2005 (in million of of cubic feet)

APPENDIX II. PRICING RULE IN THE GAS CONTRACT WITH BRAZIL

The price of gas exported to Brazil is updated every quarter according to a formula linking it to price indices of three heating oils. More specifically, the price of gas (in US\$ per million BTU) in each quarter t of year y is an average of previous quarter price and a reference price:

$$P(t) = 0.5 * P(t-1) + 0.5 * P_{ref}(t)$$

The reference price of gas $P_{ref}(t)$ is calculated according to a formula:

$$P_{ref}(t) = P(y) * (0.5 \frac{FO_1(t-1)}{FO_1(0)} + 0.25 \frac{FO_2(t-1)}{FO_2(0)} + 0.25 \frac{FO_3(t-1)}{FO_3(0)})$$

Where:

$P(y)$ - the tabulated annual coefficient that slowly increases from 0.95 in 1999 to 1.06 in 2018 by about 1 percent every two years (in 2005 it was equal to 0.98).

$FO_1(t-1), FO_2(t-1), FO_3(t-1)$ - average spot prices in the previous quarter of three heating oil defined in the contract (3.5 percent sulphur Medium Basis Italy, 1 percent sulphur Gulf Coast Waterborne, and 1 percent sulphur Norwegian respectively).

$FO_1(0), FO_2(0), FO_3(0)$ - base prices of the same oils determined as averages of spot prices during periods January 1990-July 1990 and February 1991-June 1992.

Therefore, the changes in reference price are affected by a) lagged weighted change of price indices of three heating oils, and b) annual change of tabulated annual coefficient $P(y)$. The weighted change of oil price indices is significantly (but not perfectly) correlated with the changes in crude oil price because prices of heating oils are affected more proportionally by specific climate conditions.

III. Fiscal Decentralization[1]

1.   **The overall decentralization process started in the late 1980s, with the goal of deepening the democratic structures and addressing poverty and inadequate public services.** The objectives were to promote more democratic and participatory forms of government. An initial stage included municipal elections and the development of a legal framework for fiscal decentralization in the mid-1990s, and a second stage brought a renewed focus on poverty, linked to the HIPC initiative.

2.   **While there has been some progress toward a number of decentralization objectives, design and implementation issues have precluded more significant advances in public service delivery.** Poorer/smaller municipalities saw their revenues increase substantially, as much as 300 percent in some of them. This brought about some improvements in social services. However, in spite of increases in pro-poor spending, inequalities in service delivery remain high and poverty has increased in recent years.[2] A combination of limitations in the design of the intergovernmental fiscal relations system, a budget framework which does not lay down clear budget constraints, and limited administrative capacity at the sub national level have precluded significant improvements in accountability and service delivery at all levels of government. Moreover, there have been unintended adverse consequences for fiscal management, associated, inter alia, with widening vertical and horizontal imbalances between the different levels of government and an increasing fiscal burden at the central government level, spending inefficiencies, and debt difficulties at the sub-national level.

3.   **This paper analyzes the intergovernmental fiscal relations system and recent changes to the revenue sharing arrangements, and suggests possible areas for reform**. Section A discusses the main issues that arise from the current intergovernmental fiscal relations system and analyzes the implications of recent changes to the revenue sharing arrangements. Section B discusses possible areas for reform.

A. The Intergovernmental Relations System

4.   **In reviewing the intergovernmental relations system, the main issues to be covered are expenditure assignments, revenue assignments, the transfer system, public financial management[3] and control of sub national borrowing**.[4] The remainder of this section will discuss the main issues in each of these areas.

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[1] Prepared by Alejandro Simone.

[2] Available date shows an increase in the share of population that is poor from a level of 62.6 in 1999 to a level of 64.3 in 2002.

[3] The discussion on public financial management issues will be limited to its relationship with the intergovernmental fiscal relations system since a comprehensive discussion is beyond the scope of this paper.

Expenditure assignments[5]

5. **Departments' expenditure responsibilities are not consistent with the level of resources they receive.** While the recent changes to the revenue sharing agreements in the 2005 hydrocarbons law gives more resources to departments, there has not been a corresponding transfer of expenditure responsibilities. As a result, this has contributed to worsen to the central government financial position vis-à-vis sub national governments since the central government had to devolve additional resources but still maintains roughly the same responsibilities.

6. **In contrast, the devolution of responsibilities to municipalities often seems excessive in relation to their capacity to provide services**. In addition to the typical urban services such as such as water provision and sanitation, municipalities are also responsible for construction and maintenance of school and health premises, for educational and medical equipment and supplies, for social protection services such as support to maternity, and a large variety of other policies referring to social and economic development such as sports and irrigation. The assignment of responsibilities to municipalities appears therefore often too wide for the capacity of small and medium size municipalities to provide services, and represents a challenge even to the big ones. As a result, many policies are simply not implemented, or services are inadequately provided and incentives are created for municipalities to pressure the departments or the center to carry out investments with their resources in areas under their responsibility. In addition, some responsibilities such as construction and maintenance and equipment of secondary school premises, seem wide-area functions.

7. **Overlapping spending responsibilities and lack of coordination lead to spending inefficiencies**. A case in point is in the health and education sectors, where there is extensive concurrency of responsibilities between the central government, departments, and municipalities. The central government set the norms and the curricula, and pays teachers' and medical personnel salaries. Municipalities are responsible for construction and maintenance of school and health premises and for educational and medical equipment and supplies. Departments are responsible for the implementation of norms and standards set by the central government. Selection and hiring of teachers and medical personnel is done at the departmental level. Thus, one of the consequences of this setup is that while new construction generates new requests for personnel to run the premises and to provide the services, separation of responsibilities originates frequent discrepancies between building of new premises and their staffing. More generally, investment spending decisions are not coordinated across levels of government.

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[4] Since Bolivia has limited tax collection occurring at the subnational level, issues related to tax administration in a federation are not prominent at this stage and therefore will only be touched upon marginally within the revenue assignment section.

[5] See Appendix Table 1 for a detailed description.

Revenue assignments[6]

8.   **Royalties from hydrocarbons are allocated according to where they are produced, creating significant horizontal imbalances.** As in most countries, oil and gas revenues have a geographic concentration. The department of Tarija, alone, receives almost 50 percent of total royalties distributed to departments. Due to this concentration, almost all remaining departments are dependent on shared natural resource revenues (25 percent of IEHD) and transfers from the Departmental Compensation Fund (FCD). The FCD is funded by 10 percent of IEHD revenues and its objective is to reduce inequities in revenues across departments. However, large disparities remain after the transfer of these resources (see Figure 1 below) contributing to disparities in spending and poverty rates across regions. These disparities have been exacerbated in 2005 by the increased devolution of royalties to departments established in the new hydrocarbons law.

9.   **Inadequate incentives lead to insufficient exploitation of tax bases at the sub national level**. First, both municipalities and departments have limited autonomy on decisions concerning the tax base and/or the tax rates since these decisions are mostly assigned to the central government. Second, the incentive to raise revenue through better tax administration and/or through increasing revenue is undermined by transfers from the center, which account for a large share of their revenues. Similarly, the departmental tax system presents serious weaknesses that originate from the almost total dependence on oil and natural gas taxation which has been accentuated by the 2005 hydrocarbons law (Table 1).

Transfer system[7]

10.   **The transfer system comprises revenue-sharing transfers and grants.** As in any other intergovernmental fiscal relations system, the function of these transfers is to address vertical and horizontal imbalances created by expenditure and revenue assignments. In

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[6] Responsibilities for defining tax bases and rates on all broad base taxes are assigned to the central government. The existing broad base taxes are the value added tax (IVA), the transactions tax (IT), custom duties, excises—of which the most notable is the oil product tax (IEHD)—specific consumption taxes, the business income tax (IUE) and the inheritance tax (TGB). Municipal taxes include the property tax on real estate, buildings and land, the vehicle ownership tax, the transfer tax on real estate, the transfer tax on vehicles (called IMT), a local business tax (*Patente*) and other minor taxes that are rarely used. Various fees and user charges complete the revenue instruments of municipalities. Departments do not have any major tax of their own.

[7] See Appendix Table 2 for a detailed description.

2005, revenue-sharing transfers represented about 90 percent of total net transfers of the central government to sub national governments while grants represented the remaining 10 percent.

Figure 1. Bolivia: Per Capita Revenue of Departments, 2004
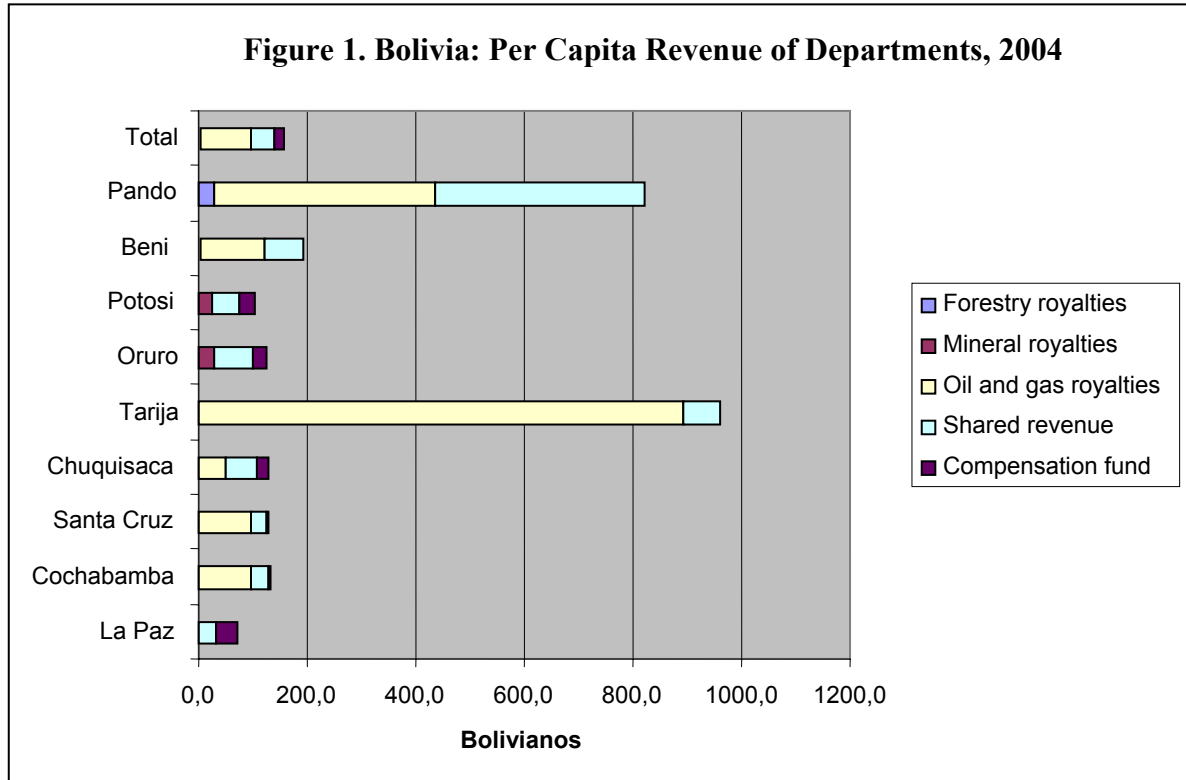
Source: Ahmad et. al. (2006)

11.   **The 2005 hydrocarbons law significantly increased the amount of revenues shared with sub national governments, without a corresponding transfer of expenditure responsibilities**. The Direct Tax on Hydrocarbons (IDH), the new tax on hydrocarbons production introduced in 2005, has increased the overall government take from the hydrocarbon sector and close to 60 percent of its collections should be transferred to sub national governments. In addition, the share of royalties going to sub national government was increased from 45 percent to 55 percent. Departments are the largest beneficiaries as they not only get additional revenue from the IDH but also the increased share of royalty collections. Universities have also benefited from additional earmarked revenues from the IDH.

Municipal transfers

12.   **There is an overlap between the objectives of the various transfer programs**. In addition to revenue sharing transfers, municipalities receive resources from different transfer programs including from several development and investment funds[8] and HIPC. Almost all of the transfers have similar earmarking requirements and are aimed to the same sectors (education, health, water and sewage). Little attention seems to be paid to the coordination across transfer programs, and more specifically to the balance between capital and operating expenditures. Moreover, an important part of the current transfer of resources is transitory or very unstable.

Table 1. Bolivia: Revenue-sharing Agreements
(In percentage)

	Municipalities	Prefectures	Universities	C. Govt.	Total
National taxes	20	0	5	75	100
Local taxes	100	0	0	0	100
FTT	0	0	0	100	100
IEHD (excise on fuel products)	0	20	0	80	100
Hydrocarbons-1996 law					
Royalties (average)	0	45	0	55	100
Existing fields	0	24	0	76	100
New fields	0	67	0	33	100
Hydrocarbons-2005 Law					
Royalties	0	67	0	33.3	100
IDH 2005	24	33	6	37.0	100
IDH 2006	24.8	33	6	36.0	100
IDH 2007	26.4	33	7	34.0	100
IDH 2008	27.6	33	7	32.5	100

Sources: Ministry of Finance; and staff estimates.

13.   **Excessive earmarking of transfers provides incentives for nontransparent accounting and inefficient spending**. Most programs earmark transfers in fixed proportions to capital and current expenditures and/or to a specific sector. This creates incentives to distort the definition of current and capital expenditures to meet defined percentages. Nontransparent accounting is also facilitated by the absence of a functional

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[8] The funds are the "*Fondo Nacional de Inversion Productiva y Social*" (FPS), the "*Fondo Nacional de Desarrollo Regional*" (FNDR)) and the "*Directorio Unico de Fondos*" (DUF). The latter was created by the *Ley de Decentralization Nacional* to coordinate and control the operation of the funds. The FPS and FNDR finance the national development and redistributive policies. In particular, the FPS concentrates on alleviating poverty, and is financed by external donors. It distributes resources to municipalities according to poverty indicators.

classification of public expenditures and weaknesses in the sub national public expenditure management systems. Excessive earmarking has been in part responsible for a significant accumulation of HIPC resources in bank accounts as other transfers also provide financing in the same areas as HIPC.[9]

14.   **The design of the transfer regime does not recognize adequately the differences in size, needs, and administrative/fiscal capacity of the municipalities**. Most municipalities are small and have limited capacity to manage resources. In addition, the transfer design does not incorporate incentives to increase tax effort by municipalities, and therefore, does not stimulate prudent spending behavior among the municipal governments, and reduces accountability. In addition, although HIPC funds were supposed to be distributed to municipalities according to poverty indicators, this has not been adequately implemented. The main reason is that 30 percent of the resources are distributed equally between regions, leading to several distortions: Pando (smallest population) receives the most per capita, Tarija (the second richest department and has most gas reserves) receives more per capita than the poorest region (Potosi). In addition, as co participation is based on population, the vast majority of transfers are uncorrelated with poverty levels (Figure 2).

Figure 2. Transfers to Municipalities and Poverty Levels
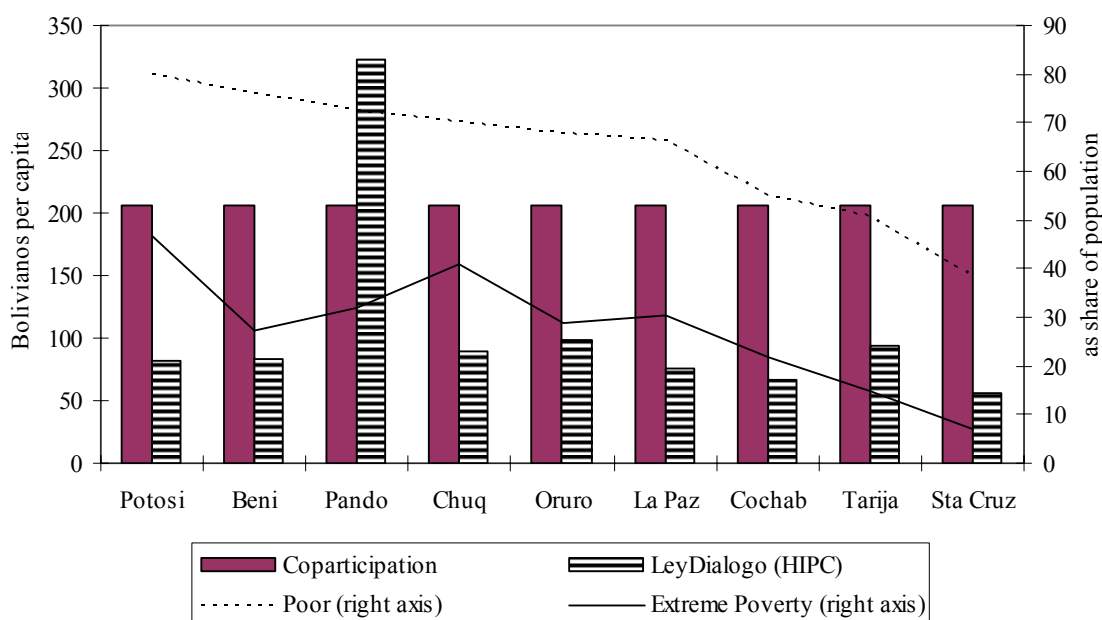
Sources: Bolivian authorities; and IMF staff estimates.

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[9] The FPS fund administers the delivery of HIPC resources. The 2004 Public Expenditure Review by the World Bank argues that complex and often contradictory procedures have impeded access to FPS funds to municipalities and are therefore also responsible for the accumulation of HIPC resources in bank accounts.

Departmental transfers

15. **The design of Departmental Compensation Fund generates pressure on the finances of the central government**. Given the concentration of royalties in the producing departments (particularly in the department of Tarija), the central government is compelled to compensate with treasury resources the unequal distribution of royalties. Presently the resources assigned to the FCD (coming from a maximum 10 percent of the IEHD revenues) are not sufficient to bring non-producing departments to the national average level of per capita royalty (Figure 2).

16. **Energy-based transfers are relatively variable in relation to permanent expenditure assignments**. Departments receive revenues whose base depends on the export price of natural gas, which in turn is linked by contract to developments in the world market price for fuels. Accordingly, there is a risk of a misalignment arising over time between the revenue of sub national governments and their expenditure assignments. In addition, over the long term hydrocarbons-based transfers will decline in line with diminishing natural gas reserves.

Public financial management

17. **The weak budget framework at the national level creates administrative problems at the sub national level and a perception of lack of clearly defined budget constraints**. More specifically, the 2004 Public Expenditure Review (PER) by the World Bank identified the following problems: (i) lack of realism of budgets with inflated revenues and unrealistic expenditures ceilings; (ii) parliament's ability to add to spending during the approval process by simply raising the amount of debt needed to fund the budget, or raising revenue forecasts; and (iii) executive authority to add to spending without prior recourse to parliament (only ex-post approval by Parliament has been the norm). As a consequence, budget execution outcomes have tended to be rather different from budgeted ones.[10] In particular, significant modifications of budgets of sub national governments can occur during the execution as past experience illustrates (Appendix Table 3). For example, for Pando, while real budgeted increases in spending averaged 18 percent in the period 1997–2002, the actual executed real increases averaged 2 percent, and only 74 percent of the modified budget was actually executed. The lack of predictability of budgets undermines the possibility for sub national governments to use them as effective tools.

18. **Key budgetary and accounting procedures are not applied, limiting the transparency and quality of the budget information and creating difficulties in tracking spending**. First, the existing budget classification lacks clarity regarding current and capital transactions and regarding financing and non financing operations. This can lead to confusion in the recording and liquidation of the transactions which could result in an

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[10] According to the 2004 PER, on average, only 85 percent of the central government budget ceilings in the final version of the budget were executed in the period 1998–2002.

inadequate representation of the economic nature of the transactions. In addition there is no functional classification, which impedes an adequate tracking of spending, particularly on the social sectors. Second, the lack of a full mapping of the budget classification to the chart of accounts undermines the integrity, timeliness and accuracy of data reporting. Third, the lack of a medium term perspective hinders the assessment of future implications of financing commitments and capital spending for recurrent expenditure. All these budgeting problems are replicated or more serious at the sub national level.

19. **Budget management capabilities tend to be limited at the sub national level**. Most sub national governments have problems to effectively track commitments and "floating debt," or even report on budget execution on a timely basis.

20. **Internal audit procedures are weak.** The latest Country Financial Accountability Assessment by the World Bank found that only 25 percent of the recommendations of the different audits carried out by the Contraloría General de la República (CGR) were implemented in 2001 and 2002. Contributing factors are a high level of turnover and low wages. Another factor that complicates internal audit, particularly at the sub national level, is the limited that reliable information available on budget execution and floating debt for departments and municipalities. While introducing a good GFMIS at the sub national level is important for adequate reporting and transparency, SIGMA, the current GFMIS of the central government, has several key weaknesses that makes it inadequate to roll out to sub national governments.[11]

Control of sub national borrowing

21. **Recent estimates from the World Bank put the stock of sub national debt at about 6 percent of GDP in 2005, consisting of 1.25 percent of GDP for departments and 4.75 percent of GDP for municipalities, mainly in the form of floating debt.** It should be noted, however, that the total exposure to debt of any given sub national administration is likely to be underestimated under current rules.[12] The regulations apply

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[11] First, it computerizes the current budget classification and chart of accounts, which would need to be modified. Second, it does not allow control over all phases of the spending process and does not allow to monitor commitments adequately. Third, the system allows for ex-post adjustments for payments outside the system. Fourth, the current version of the system is hard coded, which could imply that changes to the code could be expensive and difficult to adapt to different local circumstances.

[12] The mechanisms to calculate the limit on debt service tend to underestimate the impact of new credit operations on the future cash flow of the sub national governments. In general, the debt service-to-revenue ratio should indicate the burden of the debt level (including operations under analysis) on the entity's budget *over the entire maturity of the loan*, given various possibilities of financing that might result in larger interest payments in later years. However, the numerator of the ratio corresponds to the service of the existing debt and the service of the new operation *only for the current year*. As most loans have a grace period of at least one year for amortization, a credit operation could be approved even if it will take the total debt service to more than 20 percent of the current revenues when the grace period ends.

separately to different institutions belonging to a single government unit. At any level, public enterprises and decentralized government bodies are subject to independent control and monitoring and have their own limits. Also, guarantees provided by sub national governments are not recorded nor controlled.

22.   **The moral hazard created by several bailouts over the years does not provide an adequate environment for proper sub national debt control.** Debt control problems have been illustrated in recent years by the rising short-term debt levels that led to the "Planes de Readecuacion Financiera" (PRF).[13] Bailouts from the central government do not give sub national governments incentives to respect debt limits.[14]

B. Possible Areas for Reform

23.   **Against this background, a reform of intergovernmental fiscal relations seems necessary.** A comprehensive plan is needed because all the main areas of a decentralized system discussed above are closely related. For example, trying to reform the revenue assignments to improve the tax effort of sub national governments might not succeed without a reform of the transfer system and the expenditure assignments. Similarly, if controls on sub national borrowing are not improved, these governments would not have incentives to increase their tax effort.

24.   **A comprehensive reform strategy would define clearly expenditure responsibilities across levels of government, address issues related to revenue sharing and financing of expenditure responsibilities, improve incentives to collect revenues, spend efficiently, and prudently manage debt**. Such a reform could include the following elements:

- **A review of expenditure and revenue assignments to reduce horizontal and vertical imbalances across levels of government**. Overlapping expenditure responsibilities should be avoided and revenue earmarking reduced to avoid duplication, ensure adequate service delivery, and improve accountability. Given the heterogeneous administrative capacities of sub national governments, an asymmetric devolution of spending responsibilities should be considered. Sub national

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[13] Under the PRFs, highly indebted municipalities were able to refinance their debt in exchange of agreeing to adopting fiscal measures related to increasing own revenue and controlling expenditures in order to achieve fiscal solvency in the medium term (three years) and be in compliance with debt limits. The municipalities of Santa Cruz, Cochabamba, La Paz, Tarija, Cotoca, Trinidad, Guayarameria, Rurrenabaque, Quillacollo, and the Department of Tarija signed PRFs. The Unidad de Programación Fiscal (UPF) of the Vice Ministry of Treasury is responsible for monitoring these programs.

[14] Bolivia has legislation regarding debt control for sub national governments and decentralized entities. The legal framework on debt control defines two limits for public entities: on the present value of the debt stock and on the annual expenditure related to debt repayments. Contracting non concessional debt is prohibited without the authorization of the Ministry of Finance.

government access to own-resource revenues should be increased in line with permanent expenditure responsibilities, with a view to reducing transfers and enhance accountability. In particular, sub national governments could be given limited authority to set rates for local taxes and impose, on the margin, surcharges on national taxes within predetermined ranges. However, appropriate sequencing is needed in giving sub national governments access to new own revenue sources and the transfer of additional responsibilities. In this regard, the suggested asymmetry in the devolution of expenditure should have its counterpart in asymmetry in the access to new revenues. Only sub national governments that accept new responsibilities and perform them adequately should be given access to new tax sources.

- **A new equalization transfer system to address regional inequities.** Once revenue and expenditure assignments are redefined, the transfer system could be improved by introducing a new equalization system to address regional inequities. The sharing of hydrocarbon revenues among producing and non producing departments and general co participation resources could be based on environmental, capacity, needs, and equity criteria. While hydrocarbons producing regions should receive compensation for environmental damage, there should be a mechanism to prevent large regional asymmetries. An equalization transfer that depends on the fiscal capacity of sub national governments, on their needs, and on environmental considerations would limit the negative impact on incentives to collect own revenues, be more equitable, and also compensate for the environmental consequences of hydrocarbons production. In the calculations of the revenues available for sharing with sub national governments, there could also be a mechanism to smooth allocation of hydrocarbons revenues over time, with the central government absorbing most of the (price-related) volatility. The new equalization transfer system could be phased in with a complementary lump sum transfer in order not to introduce major discontinuities in the transfer system. The amount of this complementary transfer would diminish over time, and a complete phase out could be envisaged in due course.

- **A simplification of the transfer system for municipalities, with a gradual reduction in earmarking provisions to limit inefficient spending and nontransparent practices and accounting.** The resources coming from transitory or volatile resources should be allocated by a single agency to investments in education, health, drinking water, and sewage. This includes resources from FPS, the credits and transfers from the FNDR and the debt relief resources (if possible). The sectoral allocation percentages would be gradually eliminated, as well as the constraints on the allocation between current and investment expenditures. The resources could also be distributed according to equalization criteria discussed above.

- **A strengthening of the rules limiting sub national borrowing and a political commitment to a "no bailouts policy."** Steps that can be taken to improve fiscal rules to limit borrowing include: (i) calculating the debt stock limit in terms of present value and including any guarantees given by sub national governments or related public enterprises; (ii) making debt limits comprehensive by referring to all entities

belonging to a department or municipality; and (iii) calculating for the entire term of a new operation or the next ten years (whatever is less) the debt service to revenue ratio**. However, the political commitment to a no bailout policy is the key element. The no bailouts commitment should include strict implementation of the legal framework for sub national debt control and the application of sanctions to violators. In particular, municipalities that are unable to generate timely and comprehensive reports on their debt and finances should be prevented from borrowing.

25.   **The introduction of a budget framework law to improve the overall budget process is a key precondition regardless of the degree of decentralization finally chosen.** Approval by congress of an adequate budget framework law (BFL) with strong sanctions for non compliance is a critical step towards greater fiscal responsibility, transparency and accountability. The law would help to address the main weaknesses in public financial management and give a sound budget process basis to any intergovernmental relations system reform. In addition, sound budget process procedures in the BFL would lay the ground for reforming the government GFMIS system which is essential to improve the timeliness and accuracy of fiscal data reporting. The new budget process will imply the need to take a decision between reforming SIGMA, the current central government GFMIS system, or moving to an off-the-shelf alternative. This decision should be taken based on a sound cost benefit analysis of the options. A roll out to sub national governments of the reformed or new GFMIS system could then be considered while taking into account capacity differences across sub national governments. This would contribute to address the lack of comprehensive and reliable data that continues to prevent the effective monitoring of sub national debt.

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Appendix Table 1. Assignments of Responsibilities

Sectors	Central Government	Departments	Municipal Governments
Macroeconomic policy, defense, foreign affairs, foreign trade, monetary and bank policy, justice, public order, immigration	Full responsibility		
Education, University	Norms, curricula and funding	Funding	
Education, primary and secondary	Norms, curricula, payment of salaries,	Delivery of certificates management of teaching personnel, control of norms	Construction and maintenance of school premises and provision of didactic material
Nurseries and Pre-school education and	Norms,		Construction and maintenance of premises and provision of personnel
Health care	Preventive care, policy orientations, norms, payment of salaries	Management of health personnel, control of norms	Construction and maintenance of primary, secondary health centers and general hospitals and provision of machinery and medical supplies
Social protection (maternity, childhood, disabled, poverty relief)	National programs, policy guidelines, funding		Implementation of national programs
Environmental protection	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Tourism	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Sport and culture	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Protection of cultural heritage	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Economic promotion	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Road	Construction and maintenance of national roads	Construction and maintenance of departmental roads	Construction and maintenance of local roads
Electrification	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Irrigation	National programs, norms and technical assistance	Projects of regional interest	Projects of local interest
Water and sanitation		Support to municipalities	Construction, maintenance and provision of services
Other urban services: refuse collection, street cleaning and lighting		Support to municipalities	Construction, maintenance and provision of services

Source: Ahmad et. al. (2006).

Appendix Table 2. The Transfer and Royalty Regime in Bolivia

Type of Transfer	Recipient Government	Source of Resources	Distribution Criteria	Sectoral Allocation
Co participation of National taxes	Municipalities	20 percent of current revenues 1/	Municipal population according to census	-85 percent for investment, and 15 percent for current expenditures -7 percent of the 20 percent to SUMI -40 percent of the annual bonus of the SMGV
National Productive Investment and Social Fund (FPS)	Municipalities (and Departments as intermediaries)	Official international cooperation to the Government of Bolivia	-70 percent to the municipalities according to their levels of poverty -30 percent in equal parts to the 9 prefectures, distributed to municipalities on the basis of poverty level 2/	-Defined by the international donor -Priority sectors in the Poverty Reduction Strategy: education, health, basic sanitation, rural energy, rural development, natural resources and the environment
Credits from the National Development Regional Fund (FNDR)	Municipalities, Departments, and Commonwealths of Municipal Governments	-Official cooperation to the Government of Bolivia -Loans from multilateral organizations	-Have payment capacity or be under PRF -Have authorization from the finance ministry and the municipality or departmental council -Established accounts with TGN, FNDR, and FPS	-Preinvestment, investment and strengthening linked to investment -Sectors: transportation, agricultural and animal husbandry, basic sanitation, electricity, urban equipment, education, health, capital goods purchases, employment generation (cadastre)
HIPC II	Municipalities	Debt relief program	Poverty criteria	The resources are channeled through: -The Municipal Solidarity Fund for School Education and Public Health (US$27 million annual; 70 percent for primary and secondary education, and 30 percent for health) and the National Solidarity Fund of SUMI; -The Special Account of the 2002 Dialogue receives the difference (10 percent for health, 20 percent for school maintenance and equipment and 70 percent for infrastructure).
Co participation in the Special Tax on Hydrocarbons and Derivatives (IEHD)	Departments	25 percent of IEHD	-50 percent on the basis of population. -50 percent in equal parts among the departments.	Roadway infrastructure of the National Road Service (as counterparts of SNC projects).
Departmental Compensation Fund (FCD)	Departments	National Budget	The required amount for the Departments to reach the average national per capita royalty	Free
Hydrocarbons Royalties and IDH	Departments	See Table 3 in the text		Free
Co participation in National Taxes	Universities 3/	5 percent of national taxes		Free

Source: Ahmad et. al. (2006).

1/ On the basis of current revenue discounts contemplated by law are applied corresponding to the National customs (maximum 10 percent of custom's revenues).
2/ From the amounts to be transferred to the municipality, all non-reimbursable transfers received *directly* from international cooperation, Prefectures, other public entities different than the National Treasury are discounted.
3/ Universities also receive subsidies from the National Government, which in some years surpass co participation resources.

Appendix Table 3- Average Budget Data by Prefecture—Original Data in Constant 1990 Bolivian Pesos
(In percent)

Prefecture	Average Growth Rates 1997–2002				Changes to the Budget by Prefecture			
	Approved	Modified	Executed	Disbursed	Modified/ Approved	Executed/ Approved	Executed/ Modified	Disbursed/ Executed
Beni	7	8	9	10	106	73	69	99
Chuquisaca	4	5	2	2	106	90	85	97
Cochabamba	4	5	4	4	106	88	83	98
La Paz	5	6	6	5	106	98	93	91
Oruro	4	5	2	1	108	80	74	95
Pando	16	18	2	2	119	87	74	96
Potosí	5	6	4	5	108	97	91	89
Santa Cruz	2	4	-8	2	108	89	82	89
Tarija	5	14	21	22	129	102	76	98
Total	4	6	1	4	109	89	82	93

Source: World Bank Public Expenditure Review (2004).

IV. COMPETITIVENESS OF NONTRADITIONAL EXPORTS[1]

A. Introduction

1.   **Generating employment is a key factor in efforts to reduce poverty and improve quality of life in Bolivia.** Although unemployment, at 6 percent in 2003, is seemingly low, informality is highly prevalent, and represents almost 63 percent of the labor market. Furthermore, unemployment affects disproportionately those with lower levels of education and the young.[2]

2.   **The export sector could potentially provide high levels of formal employment, especially by businesses exporting nontraditional products linked to agriculture and manufacturing.** According to estimates by IBCE et al. (2006), the export sector generates 370,469 direct and indirect jobs, about a quarter of all formal employment (see Table 1). Agriculture and manufacturing export industries provide almost 90 percent of direct employment, and close to 75 percent of total employment in the export sector. The mining and hydrocarbons sector combined, however, accounts for only 3 percent of employment.

Table 1. Employment by Export Sector, 2005
(Number of people)

	Direct	Indirect	Total
Agriculture	5,109	213,521	218,630
Mines and hydrocarbons	4,112	7,242	11,354
Manufacturing	31,999	24,352	56,351
Other	1,078	83,056	84,134
Total	**42,298**	**328,171**	**370,469**
As a percent of total employment	1.0	8.0	9.1
As a percent of formal employment	2.8	21.5	24.3
Agriculture and manufacturing	37,108	237,873	274,981
As a percent of export sector employment	87.7	72.5	74.2
Memorandum items			
Employment (2003)			4,085,802
Of which: formal employment			1,524,004

Source: IBCE et al. (2006); and Fund staff estimates.

3.   **The conditions that have favored Bolivia's export competitiveness of nontraditional products may begin to erode in the near future.** In recent years, Bolivia's

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[1] Prepared by Laura Jaramillo Mayor.

[2] Almost 85 percent of the unemployed have less than 12 years of education, and more than 50 percent of the unemployed are between the ages of 20 to 35.

competitiveness has hinged on preferential access to key markets—in particular the Andean Community and the United States—, low labor costs, and a depreciated real exchange rate. However, preferential access is likely to erode soon with the expiration at end-2006 of unilateral benefits provided by the U.S., and as Andean countries implement bilateral free trade agreements with the U.S. and Mercosur countries. There may also be continued pressure for a real appreciation of the boliviano, in light of a strong balance of payments position. Lastly, as Bolivia loses preferential access to key markets, it will be facing more intense competition from Asian countries with lower labor costs than Bolivia.

4.   **Unless the government takes steps to enhance Bolivia's competitiveness, nontraditional exports may be undermined, with negative consequences for employment and economic growth.** The government will need to contain the real appreciation of the exchange rate through prudent fiscal and monetary policies, and continued openness of the exchange system. Bolivia will also need to diversify its export base by expanding access to international markets while taking full advantage of existing trade agreements. Structural issues will also need to be addressed, in particular ensuring stability of the legal framework and improving the conditions of transportation infrastructure.

5.   **The paper is structured as follows.** The next section describes Bolivia's main nontraditional export products and markets. Section C discusses the challenges that affect competitiveness of nontraditional exports, and Section D identifies measures that can strengthen competitiveness. Section E summarizes and concludes.

B. Main Products and Exports Markets

6.   **Bolivia's export base has changed considerably since the late 1990s, with nontraditional exports losing their dominant role.** Bolivian exports can be grouped into three main categories: minerals, hydrocarbons, and nontraditional (NT) exports that include agriculture goods and manufactures. Between 1998 and 2005, hydrocarbons exports boomed, rising from US$88 million to over US$1.3 billion, and its share of total exports increased from 8 percent to 47 percent. Mineral exports grew by only 24 percent over the same period (to US$540 million), while nontraditional exports grew by 38 percent (to US$700 million). With hydrocarbons taking up a larger share of total exports, mineral exports' contribution fell from more than 40 percent to 19 percent, and nontraditional exports' share fell from over 50 percent to 25 percent (See Figure 1).

7.   **Nontraditional exports have been increasingly concentrated on a few products.** NT exports consist mainly of soybean products, which include soybeans, soybean flour, soybean cake, and soybean crude and processed oil. These products represented almost 50 percent of nontraditional exports in 2005. Among soybean products, soybean cake exports have been growing the most rapidly. Other products include chestnuts, textiles, and jewelry, which combined comprise 18 percent of nontraditional exports. (See Figure 1).

Figure 1. Bolivia: Composition of Exports
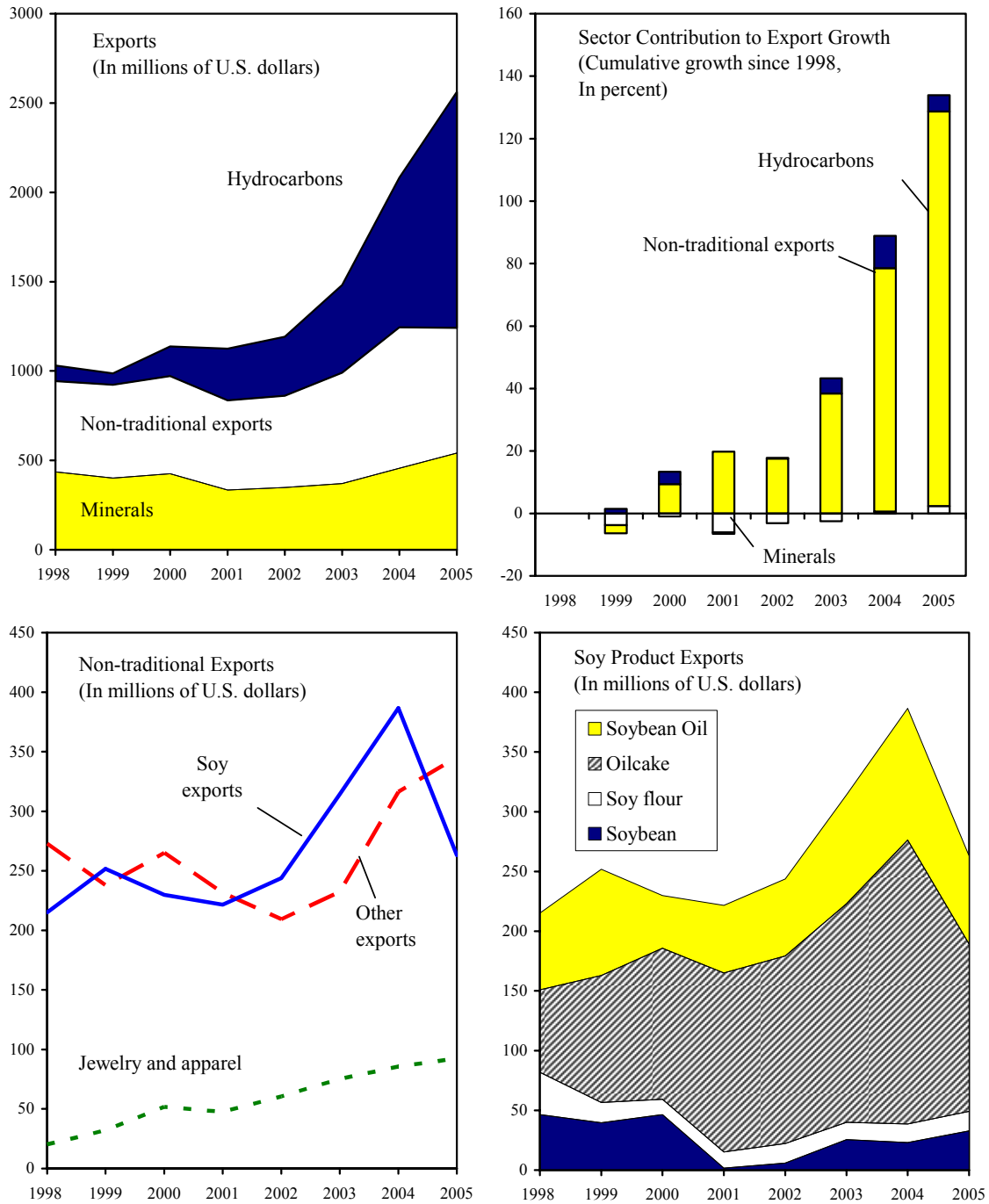
Sources: Central Bank of Bolivia; and Fund staff estimates.

8.   **The breakdown of nontraditional exports by destination also shows a shift to regional markets**. Exports of NT goods have been rising to the Andean markets, in particular to Colombia and Venezuela, while declining to Mercosur countries. Nontraditional exports to the Andean market now represent close to 60 percent of total NT exports, up from 20 percent in the early 1990s, while Mercosur's share fell from 35 percent to 5 percent. Exports to the U.S. have risen moderately, especially following the entry into force in 2003 of the tariff preferences granted under ATPDEA, and represent about 20 percent of NT exports.

9.   **Overall, Bolivian nontraditional exports are not sufficiently diversified.** Not only are NT exports concentrated in a small number of products and markets, but also exports products are fragmented across the markets. In 2005, the Andean countries (in particular Colombia, Peru, and Venezuela) purchased 93 percent of Bolivia's soy product exports, while soy products represented 94 percent of Bolivian exports to this region. Likewise, three nontraditional products (jewelry, wood products and apparel) represented 87 percent of Bolivia's exports to the U.S., while the U.S. is the sole market for jewelry exports, and buys 75 percent of apparel exports and almost half of wood exports.

C. Challenges Affecting the Competitiveness of Nontraditional exports

10.   **The prospects for nontraditional exports are grim, as the conditions that have favored their competitiveness are likely to weaken in the near term.** NT export competitiveness has hinged on a devalued real exchange rate, low labor costs, and preferential access to the Andean Community and U.S. However, these favorable conditions will begin to erode with increasing appreciation pressures on the boliviano, the erosion of trade benefits, and increased competition from other producers with lower labor costs.

Real exchange rate and labor costs

11.   **In recent years, nontraditional exports have been favored by a depreciated real exchange rate and low labor costs.** Since late 2002, the real exchange rate has been depreciating steadily, and is currently at a historical low (See Figure 3). Furthermore, Bolivia has the lowest wages in dollar terms in the region and fares favorably in terms of the flexibility of wage determination, ranking 45 out of 117 countries in the Global Competitiveness Report (2005).

Figure 2. Real Effective Exchange Rate
(Index, 2000=100)

Average
1990-2005

REER

Sources: IFS; and Fund staff estimates
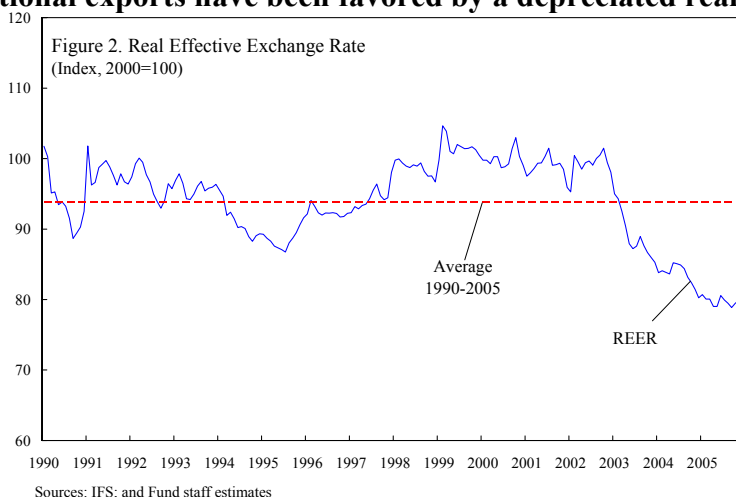
12.   **However, in the period ahead, Bolivia will no longer be able to depend on these factors to ensure competitiveness.** High hydrocarbons revenues, and more recently debt relief, may lead to real appreciation pressures on the boliviano as the country becomes the recipient of larger foreign exchange inflows. Despite recent adjustments to the minimum wage, wages are not likely to catch up to those in the region in the near term. However, when compared to Bolivia's competitors outside the region in manufactured goods such as textiles and jewelry, for example China and India, Bolivia's low wages are no longer a strong selling point (See Figure 3).

Figure 3. Labor Costs
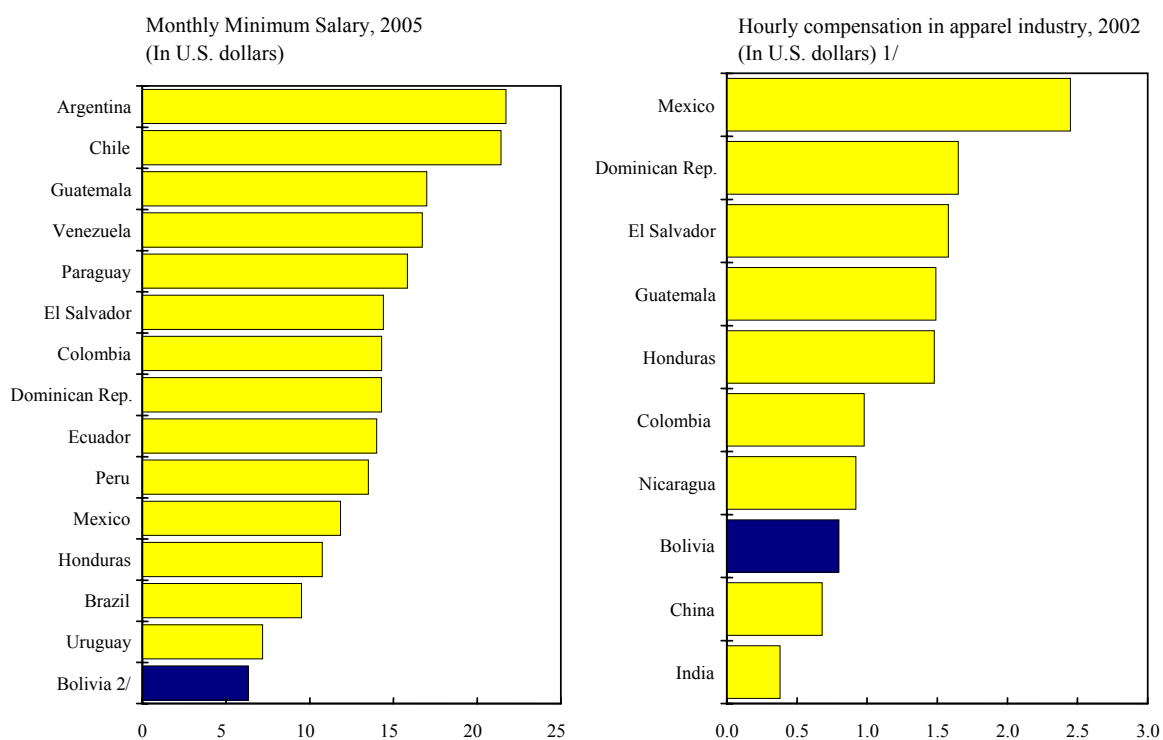
Sources: www.peru.tk; sector ministry websites; USITC (2004); and Fund staff estimates.
1/ Includes wages and fringe benefits.

Preferential access to key markets

Andean Community market

13.   **Trade preferences granted under the Andean Community have led this region to become the most important market for Bolivia's NT exports.** The Andean free trade

area (AFTA) came into effect between Bolivia, Colombia, Ecuador and Venezuela in 1993, and more recently with Peru.[3] Under AFTA, all goods originated in the Andean Community may circulate duty-free. Furthermore, in 1995, the Andean countries, excluding Peru, adopted a common external tariff for imports from third countries. Since the AFTA came into effect, Bolivian NT exports to Andean countries have nearly tripled. In 2005, Colombia and Venezuela each held about 25 percent of Bolivia's NT exports, compared to 11 percent and 1 percent respectively in 1992.

14.   **Bolivia has taken advantage of the tariff preferences in Andean countries for its exports of soy related products**. The common external tariff is 15 percent for soybeans and soybean meal, and 20 percent for soybean oil, subject to variations under the Andean Community Price Bank system.[4] Bolivia's duty free access on all these products has allowed it to take an important share of the Colombian and Venezuelan markets. Soy product exports to these markets have expanded dramatically, rising from under US$24 million in 1993 to US$145 million in 2005 in the case of the Colombia, and from US$1 million to over US$150 million in the case of Venezuela over the same period. The most important soy export product is soybean cake, which in 2005 represented 54 percent soy exports,

Figure 4. Bolivian Soy Exports by Destination, 2005
(In millions of U.S. dollars)
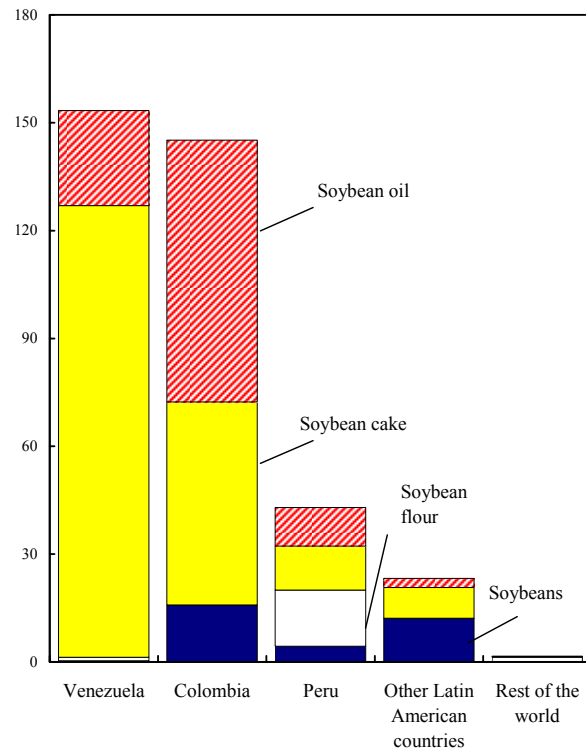
Sources: Central Bank of Bolivia; and Fund staff estimates.

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[3] In 1997, Peru agreed to become a part of the Andean free trade area in progressive steps that culminated on January 1, 2006.

[4] The Andean Community Price Bank system seeks to stabilize the import cost for a number of products, including soybeans and soybean oil. Price stability is achieved by increasing ad-valorem tariffs when international prices are below a set floor, and decreasing the tariff (until zero) when it is above the set ceiling. The Andean Community revises commodity ceiling and floor prices in April every year and reference prices are adjusted every two weeks.

Peru has a four percent tariff on soybeans, soybean meal, and crude soybean oil, and 12 percent on processed soybean oil.

followed by soybean oil, which represented 28 percent of soy exports. Venezuela is the most important in terms of soybean cake exports, while Colombia is the most important in terms of soybean oil exports (See Figure 4).

15.   **Bolivia's competitiveness in the Andean region, in particular for soy products, may be undermined as these countries advance in free trade agreements with third countries.** The bilateral free trade agreements of Peru and Colombia with the U.S., and Venezuela's move to become a permanent member of Mercosur, may weaken Bolivia's ability to compete in their soy market. Once Colombia and Peru's FTAs come into force in 2007, the U.S. would be granted immediate duty free access for soy related products, except for a 5–10 year phasing out of tariffs for soybean oil in the case of Colombia. For its part, Venezuela is expected to become a full member of Mercosur by 2010, and provide duty-free access to these countries by 2012. It is likely that these Andean countries will substitute Bolivian soy products with cheaper imports from Argentina, Brazil and the U.S.[5] Although direct costs of soy production per hectare in Bolivia are low, it has the lowest yield. More importantly, the high cost of transportation makes Bolivian soy exports uncompetitive once tariff preferences are eroded (See Table 2). Proximity to Peru may allow Bolivia to retain its share of that market, but this represents only 12 percent of Bolivia's soy product exports.

Table 2. Comparative Soybean Production Costs, 2004

	Direct production costs			Administration and transportation costs	Total
	US$/ha	Yield (mt/ha)	US$/mt	US$/mt	US$/mt
Argentina 1/ 2/	183.4	2.6	70.8	49.8	120.6
Bolivia 1/	182.0	1.9	94.7	79.0	173.7
Brazil 3/	267.0	2.5	104.9	23.1	128.0
U.S. 4/	221.0	2.6	83.7	18.0	101.7

Sources: Kreidler Guillaux (2004), FAOSTAT database; and Fund staff estimates.

1/ Transportation costs to Rosario port in Argentina.
2/ Costs for Argentina do not include export taxes.
3/ Transportation costs to Paranagua port in Brazil.
4/ Transportation costs to Gulf ports in U.S.

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[5] Bolivia may be able to retain its market share in the Venezuela thanks to a bilateral agreement between the two governments in early 2006. Venezuela agreed to buy 200,000 tons of soybean products from Bolivia and negotiations are ongoing to increase the amount of soybean oil imports by 17,000 tons. However, the details of this agreement, including its duration, still need to be fleshed out.

United States market

16.   **Since the early 1990s, the United States has granted preferential market access
to Bolivia under the Andean Trade Preference Act (ATPA).**[6] ATPA was enacted at end-
1991, and later renewed and modified by the Andean Trade Promotion and Drug
Eradication Act (ATPDEA) in mid-2002. ATPDEA provides duty-free treatment for a wide
range of products from Bolivia, Colombia, Ecuador and Peru, including certain apparel and
leather products, as long as they are wholly produced in an ATPDEA country. ATPDEA
benefits are especially important for Bolivian apparel exports, as the U.S. Most-Favored
Nation (MFN) tariff is between 17–20 percent. Benefits are more moderate in the case of
jewelry, where the MFN tariffs fluctuate between 5 and 6 percent, and wood products where
they are between 3 and 8 percent.

Figure 5. Exports to the U.S. under ATPA and ATPDEA
(In millions of US$)

Jewelry
Apparel and clothing
Total ATPA and non-ATPA exports
Mineral fuels and oils
Other

Source: USITC, and Fund staff estimates
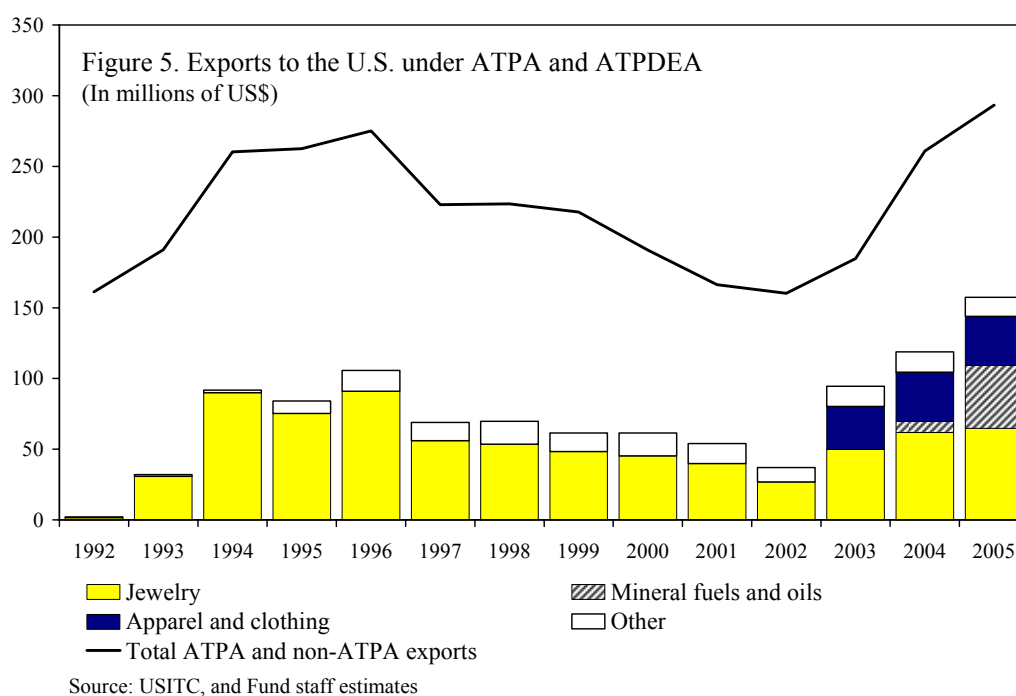
17.   **Bolivian exports of jewelry and apparel have increased considerably in the
context of ATPDEA.** Nontraditional exports to the U.S. have increased by 65 percent since
ATPA came into effect, and 48 percent since ATPDEA was enacted. NT exports to the U.S.
market under ATPDEA reached about US$112 million in 2005, two thirds of which was
comprised by jewelry and apparel. Since ATPDEA became effective, apparel exports
(90 percent of which are cotton products) have almost doubled and jewelry exports have

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[6] Bolivia also benefits from the US General System of Preferences (GSP), which is set to expire at end-2006.
The GSP provides access to the US market for certain products. However, ATPA includes more categories of
products (including textiles and apparel), and more liberal rules of origin.

increased by 33 percent (See Figure 5). Nonetheless, Bolivia only holds a tiny fraction of the U.S. market, 0.1 percent in the case of apparel, and 0.2 percent in the case of jewelry.

18. **The expiration of ATPDEA at end 2006 raises concern about the future of nontraditional exports to the U.S. market.** Bilateral FTA agreements between the U.S. and other ATPDEA beneficiaries, as well as uncertainties about the future of ATPDEA in general, suggest that the current arrangement may not be extended. Also, negotiations of a bilateral free trade agreement between Bolivia and the U.S. are not in the pipeline. Losing ATPDEA trade preferences could serve a significant blow to NT exports, especially as competitor countries- such as Peru in the case of apparel- consolidate their access to the U.S. market. Furthermore, Bolivia is already facing increased competition from cheaper Asian producers, such as China, India, and Thailand. Despite its small size, already in 2005 Bolivia lost 5–6 percent of its share in the U.S. market for apparel and jewelry to these countries.[7]

D. Measures to Strengthen Competitiveness

19. **To maintain competitiveness of the exchange rate, the authorities will need to exercise prudent fiscal and monetary policies, and ensure continued openness of the exchange rate system.** To prevent excessive monetary expansion that could lead to inflationary pressures, the government will need to keep under restraint its overall fiscal balance excluding revenues from hydrocarbons. The central bank will also need to maintain a cautious monetary stance to forestall upward pressures on domestic prices. Any type exchange controls would result in implicit taxes on exporters, and should be avoided.

20. **To diversify its export base, Bolivia should seek to expand access to international markets, while taking full advantage of existing trade agreements.** The extension of current trade benefits to Andean countries and the U.S. is not entirely in the hands of the Bolivian authorities. Nonetheless, they could remain open to options that may facilitate a continuation of preferential access. The country should explore further other markets in the region, especially as the Bolivia has already signed a number of trade agreements within the framework of the Latin American Integration Association, including with Chile, Mercosur, and Mexico. Bolivia's sponsor of an agreement between the Andean Community and the European Union is a move in the right direction.

21. **The government will also need to address structural issues to enhance private investment in the export sector.** It will be important that the authorities avert investor uncertainty by ensuring stability of the legal framework, including in taxation and protection of property rights. Other structural issues also need to be tackled, including those identified by several international agencies The World Economic Forum (2005) placed Bolivia at the bottom of the list of its growth competitiveness index, with a rank of 101 out

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[7] In the case of apparel, Bolivia is likely to retain its niche of specialized products made from indigenous materials, such as alpaca. However, this is only a fraction of current exports.

of 117 countries. According to this report, the most problematic factors for doing business were political instability, access to financing, corruption and inefficient government bureaucracy, inadequate supply of infrastructure, and the inadequately educated workforce. Property rights and judicial independence were also considered problematic. Similar issues were identified by the World Bank/IFC Doing Business indicators, which ranked Bolivia low compared to the region for a number of factors, in particular registration of property, the costs of trading across borders, and enforcing contracts.

22. **Among structural issues, particular attention should be paid to Bolivia's deficient transportation infrastructure.** The total cost of transporting goods in Bolivia, as a percentage of import value, is the highest in South America, and the cost of transporting a product to a port is about ¼ of the export price (See Figure 6).[8] Almost half of nontraditional exports are transported by truck to seaports; however roads are in poor conditions and less than 7 percent of Bolivia's 60,000 km of roads are paved. The government should take steps to ensure proper maintenance of existing roadways and make greater investments in transportation infrastructure that would benefit export shipments.

Figure 6. Freight ratios
(In percent of import value)

Sources: UNCTAD (2005), and Orcullo Cossio (2005)
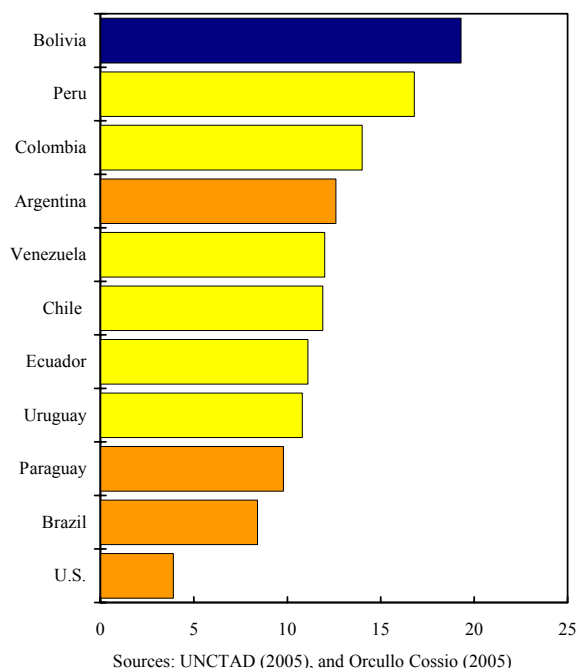
E. Conclusions

23. **In recent years, Bolivia's export competitiveness for nontraditional products has hinged on preferential access to regional markets, low labor costs and a depreciated real exchange rate.** Bolivia's nontraditional exports have increasingly been going to the Andean Community countries and the U.S., which have provided duty-free

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[8] In 2004, the cost of ground transportation of soy products to the Pacific (Santa Cruz-Arica in Chile) was US$56-64 per ton, and the cost of the maritime freight from Arica to Buenaventura in Colombia was US$50 per ton. The cost of exporting though the Atlantic (Santa Cruz-Rosario in Argentina) was about US$52 per ton, and US$60 per ton for the maritime freight to Buenaventura. These transportation costs are expensive compared to the freight cost to Colombia from the US gulf coast (US$45 per ton) and Rosario in Argentina (US$72 per ton) See Kreidler Guillaux (2004).

access for Bolivia's exports. While taking advantage of the privileged access, Bolivian nontraditional exports have increasingly concentrated in a small number of products.

24. **Given its importance as a source of formal employment, the government will need to take measures to enhance export competitiveness as favorable conditions for the sector begin to weaken.** The authorities will need to follow prudent fiscal and monetary policies to contain appreciation pressures on the boliviano arising from a strong hydrocarbons revenues. To offset the erosion of trade benefits to the U.S. and Andean region, Bolivia should seek to expand access to international markets while taking full advantage of existing trade agreements. Bolivia will also need to address structural issues to enhance private investment in the export sector, in particular by ensuring stability of the legal framework and improving the conditions of transportation infrastructure.

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V. Adequacy of International Reserves[1]

1.   **This chapter assesses measures of reserve adequacy in Bolivia, both on a standalone basis and in relation to a broad sample of countries with various degrees of dollarization and exchange rate regimes.** Particular attention is given to patterns of evolution of reserve adequacy measures as dollarization and exchange rate flexibility evolve, and the relevant implications for Bolivia. The main conclusions are that Bolivia's reserve adequacy has improved significantly in recent years, and is now similar to that in many other comparable countries in terms of coverage of broad money and short-term debt by residual maturity. However, given its very high dollarization level, Bolivia lags behind most of those countries—including in its exchange rate group—in reserve coverage of foreign currency deposits.

A. General Rationale and Cost of Holding Reserves

2.   **From a precautionary point of view, there are essentially two reasons to hold higher reserves**. First, reserves provide a buffer in case of balance of payments or/and financial crisis, by allowing to meet increasing demands for foreign currency. The second reason is that a higher level of reserves may itself reduce the likelihood of crises, while a decline of reserves below a certain level may increase such probability or even trigger an attack against the currency. With regard to the buffer function, a distinction should be made between vulnerabilities associated with the external current account and those originating from the capital account. The latter normally develops much faster and depends more strongly on the state of expectations of foreign and domestic residents about the economic prospects, and, in particular, the sustainability of exchange rate regime.[2]

3.   **The costs of holding higher reserves are associated with the gap between the interest rate on reserve holdings compared with that on public debt and/or or central bank-issued monetary policy instruments**. These costs in turn depend on whether reserves are accumulated through sterilized or nonsterilized intervention; or through foreign borrowing. While accumulating reserves through nonsterilized intervention is the least-costly way, this form of accumulation is possible only when the demand for domestic money is increasing. As reserves will still earn a low rate of interest compared with the domestic productive assets, some authors have argued against intervention in general. However, not intervening when demand for domestic currency is increasing may lead to an unduly appreciated real exchange rate, with detrimental effects on competitiveness. This might reduce the return on productive assets and have negative long-run consequences that could outweigh the cost savings from not holdings additional reserves.

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[1] Prepared by Sergei Dodzin.

[2] Some authors (e.g. Lee, 1994) use the term "insurance value of reserves" to underscore that reserves provide the unexpected claims on foreign currency by financial market participants resemble a structure of a "put option" which is also similar to insurance claim.

4.   **International reserves may increase substantially for reasons other than precautionary accumulation**. For example, when a country runs large overall balance of payments surpluses in a context of limited exchange rate flexibility, as has been the case of Bolivia in recent years. Such an increase, even if not primarily motivated by precautionary objective, contributes to increased reserve adequacy.

5.   **While central bank reserves are the primary element ensuring protection against foreign currency drains, other liquid foreign assets of the financial system can also perform a similar function.** At the same time, an often overlooked fact is that commercial banks' and other financial system institutions' external liabilities also need to be considered along with domestic foreign currency liabilities. This paper therefore computes, in addition to traditional measures, coverage of domestic and external financial system liabilities by reserves and other financial system liquid assets.

B. Specifics of Bolivia's International Reserves and Relevant Measures of Adequacy

6.   **Bolivia's international reserves comprise the official central bank (BCB) reserves and a liquidity asset requirement portfolio with mandatory contributions from banks (RAL), which is managed by the BCB**. The official central bank reserves include a foreign exchange portion of reserve requirements of bank and nonbank financial institutions applied to foreign exchange deposits. The reserve requirement rate is 2 percent, applicable to foreign exchange deposits with maturity up to 360 days. The liquid asset requirement for the RAL is 10 percent. It applies to time deposits in foreign exchange with a maturity of up to 720 days. Because RAL essentially represents another element of reserves, this paper considers that the appropriate concept to assess reserve adequacy is the sum of official reserves and RAL.

7.   **The most relevant reserve adequacy indicators for Bolivia are financial system liability based indicators, because of a the highly dollarized financial system**. The available menu includes: (i) money and financial system liability-based indicators (e.g., R/Broad Money, R/FX deposits); (ii) debt-based indicators (R/ STD); (iii) reserve-imports indicators; and (iv) combined current/capital account-based indicators. The advantages and disadvantages of various types of indicators are summarized in Table 1. Short term external debt indicators appear to be the least relevant for Bolivia because of the lack of broad access to the capital markets and significant share of official creditors in overall external financing. Reserve adequacy indicators should not be considered alone, but in the context of the overall macroeconomic environment and framework of the country, in particular exchange rate regime. In general, countries with fixed and less flexible exchange rate regime require higher reserve coverage.

Table 1. Reserve Adequacy Indicators and Their Usefulness for the Bolivian Case

Indicator	Advantages	Disadvantages
1. Reserves / Broad Money	Good measure of reserve adequacy in case of runs on currency by domestic residents, in particular in the environment of fixed exchange rates.	Some developing countries with a growing demand for domestic money and overall stability will naturally have lower ratio of reserve to broad money, therefore a comparison of Bolivia with such countries is not useful.
2. Reserves / FX deposits	Good measures of reserve adequacy in case when runs are associated with the perception of insufficient foreign exchange obligations.	In case of the run on banking system the residents are likely to withdraw domestic currency deposits and exchange the proceeds in foreign currency, thus creating additional FX demand. The measure does not capture this.
2. Reserves / Short Term External Debt by Residual Maturity	A good indicator of rollover needs with respect to foreign creditors.	Because Bolivia does not have market access, and most of the foreign creditors are official, is not a good measure to convey a likelihood of a crisis.
3. Reserves / Imports	A useful indicator in case when reserve drains are related to the trade balance while capital account is closed and domestic money demand is stable.	Does not capture drains on reserves from currency runs by domestic residents and rollover needs.

C. Assessment of Reserve Adequacy in Bolivia

8. **Bolivia's reserve adequacy has improved significantly in recent years according to all relevant measures (Table 2, Figures 1-2).** The reserve coverage of foreign exchange deposits increased from about 40 percent in end-2000 to about 70 percent in end-2005, while the coverage of broad money increased from 34 percent to 48 percent. During the same period, the coverage of foreign exchange deposits and financial system external liabilities (by reserves and other financial system assets) increased from 41 percent to almost 80 percent.

Figure 1. Bolivia: Reserve Coverage of Broad Money: 2000-2005
(in percent)

☐ Gross official reserves+RAL/Broad Money ■ Gross official reserves+RAL+ Fin. system assets abroad / Broad Money + Fin system ext. liabilities
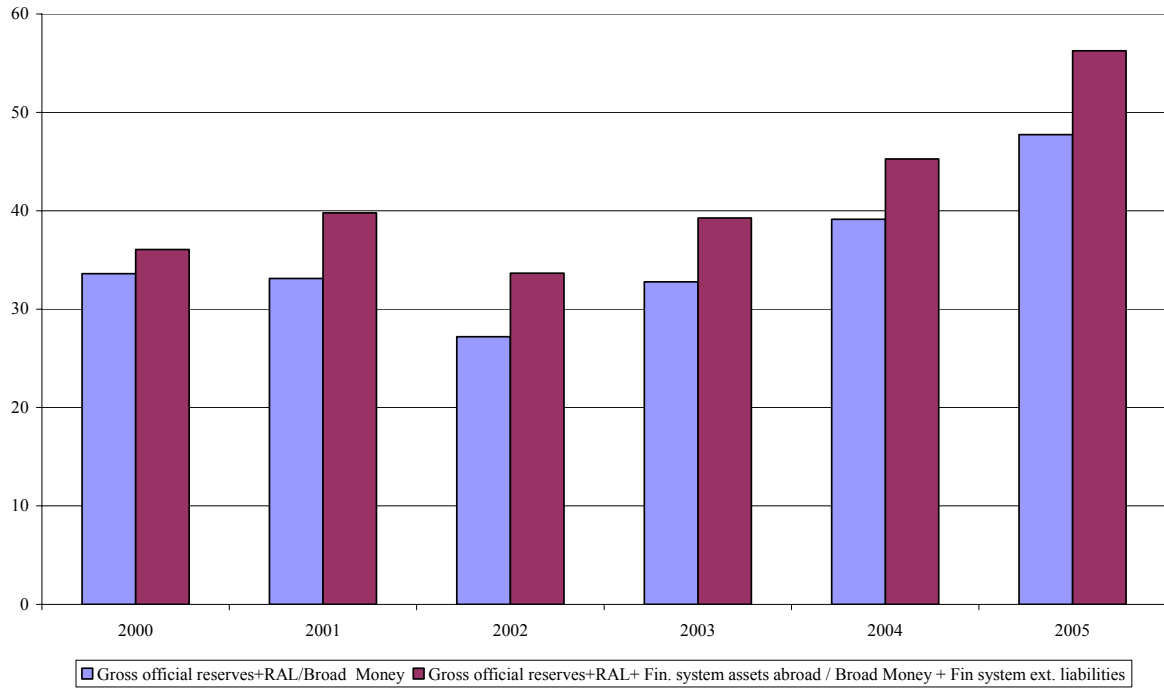
Figure 2. Bolivia: Reserve Coverage of Dollar Deposits: 2000-2005
(in percent)

☐ Gross official reserves+RAL/FX deposits ■ Gross official reserves+RAL+ Fin. system assets abroad / Dollar deposits + Fin system ext. liabilities
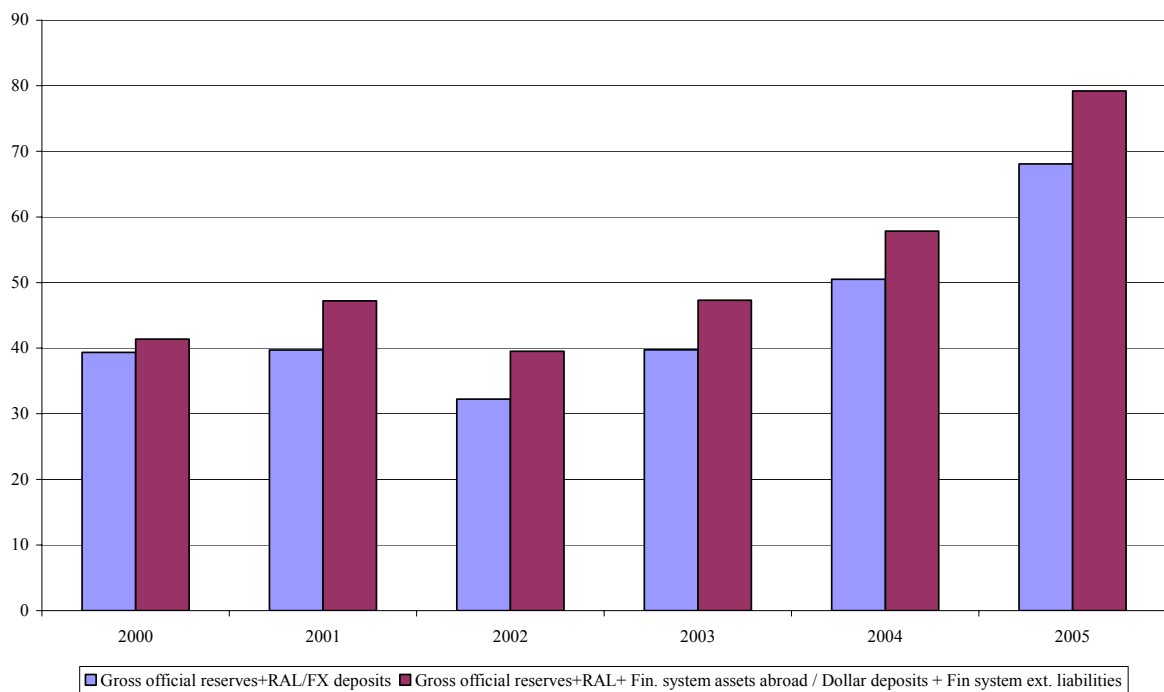
9.   **The main factors contributing to the progress on the reserve adequacy front have been higher exports, notably of natural gas, and an increase in the demand for boliviano-denominated assets (Fig. 3).** Exports of natural gas have increased eightfold since 2000, due both to increase in export volumes and higher prices. At the same time, improvements in the economic outlook, combined with the macroeconomic policies oriented to stability and some de-dollarization measures, have led to decline in the share of U.S. dollar deposits in broad money (from 85 percent at end-2000 to 70 percent at end-2005).

Figure 3. Bolivia: Coverage of Dollar Deposits, Deposit Dollarization, and Gas Exports
Index: 2000-2005
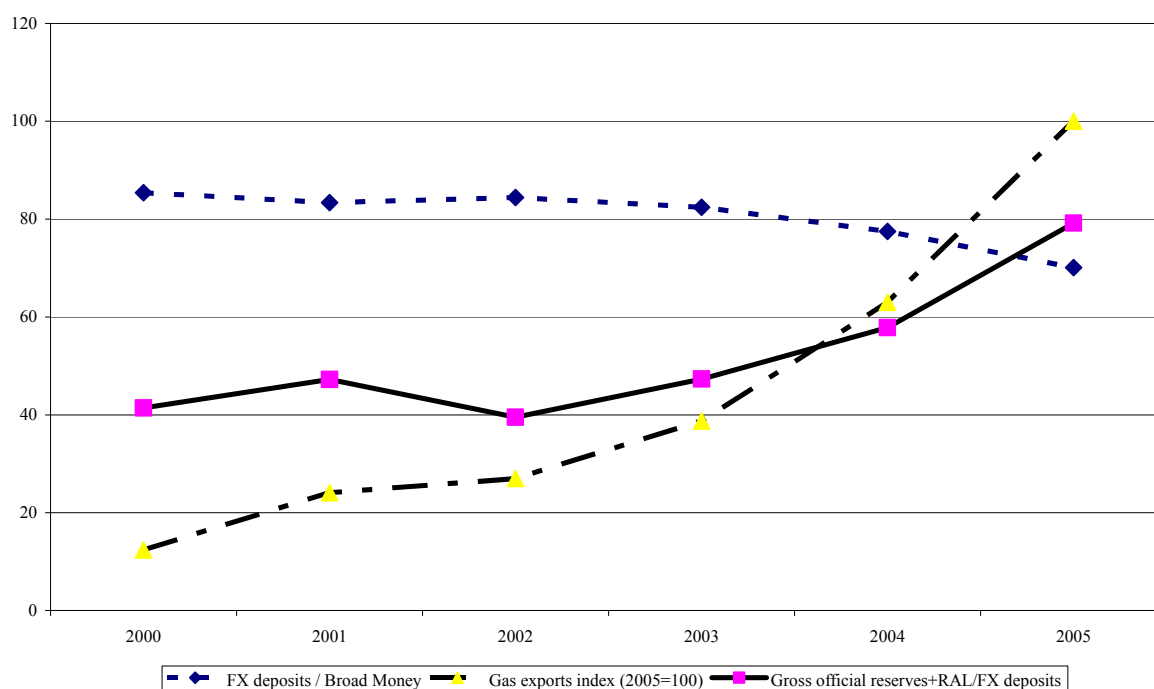
10.   **To assess Bolivia's reserve adequacy standing, it is useful to compare its position with that of a broad sample of countries, with particular attention to the degree of dollarization and exchange rate flexibility.** To this end, we consider emerging and developing countries from various regions, with significant Latin American representation (Table 3). The calculation of dollarization indices for the countries was based on the methodology developed by Rogoff et.al. (2003), with countries divided into four dollarization groups.[3] The exchange rate classification is a de facto classification based on

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[3] The dollarization index takes into account the degree of domestic dollarization (share of foreign deposits in broad money and share of foreign exchange denominated domestic public debt in total debt), as well as a degree of external indebtedness of the countries.

the 2005 Annual Report on Exchange Arrangements and Exchange Restrictions prepared by IMF, and, in some cases, on study by Rogoff et.al. (2004). To enhance understanding of the degrees of dollarization across the exchange rate regimes and relative standing of Bolivia, Table 4 presents dollarization indicators and main exchange rate indicators across the exchange rate regimes (pegged, crawl, managed float, and independent).

11. **Comparison of Bolivia with other countries indicates that:**

- Bolivia has an average reserve coverage of broad money, both within its exchange rate regime group (crawling peg) and compared to fixed-peg and managed-float regimes.

- Bolivia's coverage of short term external debt by residual maturity is also similar to the average within its exchange rate regime group (crawling peg), and somewhat higher than the averages in other exchange rate groups (after taking out extreme outliers).

- Bolivia's coverage of foreign exchange deposits is lower than average, both in its own exchange rate group, and in all other exchange rate groups. The reason is the high share of foreign currency deposits in overall broad money. Notably, more flexible exchange rate regimes (e.g. managed float and independent float) tend to have lower share of foreign currency deposits in broad money.

12. **These findings suggest that, in the area of reserve adequacy, Bolivia's main source of concern is high deposit dollarization, while other important reserve adequacy measures are broadly adequate.** The aim of reducing deposit dollarization could be pursued in the context of maintaining a sound macroeconomic framework and predictable overall economic environment, which are conducive to increased demand for domestic currency instruments. The findings also suggest that moving towards a more flexible exchange rate regime could further reduce the need for reserve coverage of foreign currency deposits and other domestic and foreign liabilities.

Table 2. Bolivia: International Reserves, Financial System Foreign Assets and Liabilities,
and Reserve Adequacy Indicators, 2000-2005

	2000	2001	2002	2003	2004	2005
Official reserve assets and liabilities and RAL						
Net official reserves	1,046	1,046	772	888	1,076	1,568
Gross official reserves	1,104	1,068	758	974	1,211	1,706
Of which: reserves in FX	...	53	50	56	63	89
banks		46	43	47	53	76
nonbanks		7	7	9	10	13
Gross official liabilities	-57	-22	15	-86	-135	-137
RAL	333	326	279	281	262	345
RAL of banks	274	259	218	211	194	278
RAL of non banks	60	68	61	69	68	68
Net official reserves + RAL	1,380	1,373	1,052	1,169	1,337	1,913
Gross official reserves + RAL of banks	1,377	1,327	976	1,186	1,404	1,983
Gross official reserves + RAL of financial system	1,437	1,395	1,037	1,255	1,472	2,051
Gross Reserves + RAL of Banks+ Banks assets abroad (exl. RAL, RR)	1,674	1,693	1,283	1,472	1,685	2,386
Gross Reserves + RAL of Fin. Syst+ Fin. Syst. assets abroad (exl. RAL, RR)	1,740	1,770	1,347	1,550	1,763	2,494
Financial system foreign assets and liabilities (excluding RAL and RR) and domestic FX deposits						
Bank net foreign assets (excl. RAL and RR)	-179	159	137	180	161	281
Banks foreign assets (exl. RAL and RR)	297	366	307	286	281	403
Banks foreign liabilities	-476	-208	-170	-106	-119	-122
Nonbank net foreign assets (exl. RAL and RR)	-69	-21	-19	-5	-4	25
Nonbanks foreign assets (excl RAL and RR)	6	9	3	9	10	40
Nonbanks foreign liabilities	-75	-31	-23	-14	-15	-15
Total FX deposits	3,652	3,512	3,217	3,158	2,914	3,013
FX deposits of banks	3,015	2,876	2,521	2,384	2,152	2,263
FX deposits of nonbanks	636	636	696	774	762	750
Broad Money (Fin. system)	4,275	4,211	3,810	3,830	3,762	4,298
Broad money (fin. system) + Fin. System external liabilities	4,826	4,450	4,004	3,950	3,896	4,435
Short term external and domestic debt by residual maturity						
Short term external debt by residual maturity	...	...	...	645	608	466
Public	175	256	395	338	336	300
Private	...	...	...	307	272	167
Short term public domestic debt in foreign currency by residual maturity	191	152	169	97	164	156
Reserve adequacy ratios						
Fin. System FX deposits / Broad Money (fin system)	85	83	84	82	77	70
Gross official reserves + RAL of fin. system / Fin system FX deposits	39	40	32	40	51	68
Gross official reserves+RAL of fin.syst + fin.syst assets abroad / Fin. system dollar deposits + Fin syst liab	41	47	40	47	58	79
Gross official reserves+RAL of fin. syst./ Broad money	34	33	27	33	39	48
Gross official reserves+RAL of fin. syst. + fin system assets abroad / Broad money + Fin system liab.	36	40	34	39	45	56
Gross official reserves / Short term external debt by residual maturity	...	...	...	151	199	366
Gross official reserves +RAL / Short term external debt by residual maturity				184	231	425
Gross official reserves / Short term external debt and public FX debt by residual maturity	...	...	...	131	157	274
Gross official reserves + RAL of fin. system / Months of imports of gooods and services	8.3	8.5	6.1	7.6	7.6	8.6
Memorandum items						
Exchange rate - end period	6.38	6.81	7.48	7.82	8.04	8.00
Exports of goods and services	1,470	1,521	1,562	1,872	2,562	3,126
Imports of goods and services	-2,078	-1,980	-2,051	-1,976	-2,331	-2,871
GDP	8,377	8,154	7,936	8,099	8,809	9,844

Sources: BCB; and Fund staff estimates.

Table 3. Sample of Countries for Comparison o Reserve Adequacy

Country	Dollarization Index (2005) 1/	Exchange rate group 2/	Dollarization group 3/	Gross Reserves/ Broad Money	Gross reserves/ FX deposits	Gross Reserves/ Short term external debt 4/
Lebanon	26	1	4	32	48	44
Ecuador	25	1	4	23	23	54
Croatia	22	1	4	36	63	125
Latvia	14	1	4	34	106	18
Bolivia	**21**	**2**	**4**	**48**	**68**	**366**
Paraguay	16	3	4	55	138	775
Argentina	14	3	4	50	261	83
Nicaragua	15	2	4	37	51	296
Bulgaria	13	1	3	55	395	164
Estonia	12	1	3	31	153	75
Lithuania	10	1	3	34	179	29
Hungary	9	1	3	36	249	77
Jordan	9	1	3	31	132	994
Slovak republic	9	1	3	52	444	55
Kazakhstan	12	2	3	47	132	63
Mongolia	12	2	3	45	9852	1657
Honduras	10	2	3	45	163	517
Israel	9	2	3	22	122	...
Jamaica	10	2	3	56	197	789
Cambodia	13	3	3	92	139	6133
Peru	11	3	3	64	131	275
Turkey	11	4	3	29	65	79
Philippines	10	4	3	33	126	127
Poland	9	4	3	33	248	104
El Salvador	8	1	2	250	31	211
Uganda	8	1	2	78	331	940
Bosnia and Herzegovina	7	1	2	49	134	473
Malaysia	6	1	2	51	1,505	415
Pakistan	6	1	2	21	9,852	273
Costa Rica	7	2	2	24	152	644
Egypt	8	3	2	24	163	561
Romania	8	3	2	77	256	310
Indonesia	7	3	2	28	179	141
Czech republic	6	3	2	33	90	81
Dominican republic	6	3	2	21	23	139
Russia	6	3	2	72	204	422
Tunisia	6	3	2	27	10,714	117
Colombia	5	3	2	37	905	130
Guatemala	5	3	2	36	375	97
Thailand	4	3	2	31	3,950	237
Chile	7	4	2	37	314	117
Sri lanka	6	4	2	27	128	410
Brazil	4	4	2	22	20,248	122
Korea	4	4	2	37	1,081	...
Mexico	4	4	2	33	705	168
China	3	1	1	37	431	500
Algeria	3	3	1	106	1,438	1,144
Morocco	3	3	1	32	27,851	785
South Africa	3	4	1	12	428	181

Source, IFS, ARERAER, and Fund staff estimates.

1/ Cacluclated according Rogoff -et.al. Methodology . See "Addicted to Dollars," NBER working paper 10015, 2003

2/ De facto classification. Based on AREAER and, for some countries on Rogoff and Reinhardt,
"The Modern History of Exchange Rate Arrangements: A Reinterpretation," Quarterly Journal of Economics, 2004.
1 - fixed pegged regime, 2 - crawl, 3- managed, 4- independently floating

3/ 4- very high dollarization, 3- high dollarization, 2 - moderate dollarization, 1 - low dollarization

4/ By remaining maturity.

Table 4. Reserve Adequacy and Dollarization Across Exchange Rate Regimes

	Overall dollarization index	Gross official Res / M2	Gross official reserves / FX deposits	Gross official Res / STD
Pegged regimes				
Average 1/	13	56	194	268
St.dev. 1/	*7.0*	*57.6*	*149.8*	333.4
Lebanon	26	32	48	44
Ecuador	25	23	23	54
Croatia	22	36	63	125
Latvia	14	34	106	18
Bulgaria	13	55	395	164
Estonia	12	31	153	75
Lithuania	10	34	179	29
Hungary	9	36	249	77
Jordan	9	31	132	994
Slovak republic	9	52	444	55
El Salvador	8	250	31	211
Uganda	8	78	331	940
Bosnia and Herzegovina	7	49	134	473
Malaysia	6	51	1505	415
Pakistan	6	21	9852	273
China	3	37	431	500
Crawl regimes				
Average	13	41	107	377
St.dev.	*4.8*	*8.9*	*47.5*	*221*
Bolivia	21	48	68	366
Nicaragua	15	37	51	296
Kazakhstan	12	47	132	63
Mongolia	12	45	77	1657
Honduras	10	45	163	517
Costa Rica	7	24	152	644

Table 4. Reserve Adequacy and Dollarization Across Exchange Rate Regimes
(continued)

	Overall dollarization index	Gross official Res / M2	Gross official reserves / FX deposits	Gross official Res/STD
Managed float regimes				
Average 2/	9	50	173	253
St.dev. 2/	*3.8*	*23.7*	*97.3*	*234.5*
Paraguay	16	55	138	775
Argentina	14	50	261	83
Cambodia	13	92	139	...
Peru	11	64	131	275
Egypt	8	24	103	561
Romania	8	77	256	310
Indonesia	7	28	179	141
Czech republic	6	33	90	81
Dominican republic	6	21	23	139
Russia	6	72	204	422
Tunisia	6	27	10714	117
Colombia	5	37	905	130
Guatemala	5	36	375	97
Algeria	3	106	1438	1144
Morocco	3	32	27851	785
Independent float regimes				
Average 3/	7	30	387	169
St.dev. 3/	*3.0*	*8.3*	*347.9*	*111.8*
Turkey	11	29	65	79
Philippines	10	33	126	127
Poland	9	33	248	104
Chile	7	37	314	117
Sri lanka	6	27	128	410
Brazil	4	22	20248	122
Korea	4	37	1081	...
Mexico	4	33	705	168
South Africa	3	12	428	181

Sources: IFS; Bolivian authorities; and Fund staff estimates.
1/ Excluding Malaysia, Pakistan.
2/ Excluding Tunisia, Colombia, Algeria, Morocco.
3/ Exluding Brazil.

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VI. EXTERNAL DEBT AND DEBT RELIEF

1.   The external debt burden has been historically one of the main factors underlying
Bolivia's macroeconomic vulnerability. Protracted fiscal imbalances, fueled in part by large
public sector investment, and an undiversified export sector, have been at the base of
Bolivia's weak external solvency position. In the mid-1990s, before Bolivia benefited from
major debt relief initiatives, nominal public external debt was more than four times total
exports, and about 70 percent of the GDP. In NPV terms, it was above 270 percent of
exports. At the same time, annual debt service was beyond manageable levels, at more than
30 percent of exports.

2.   **As a result of the implementation of the Heavily Indebted Poor Countries
Initiative (HIPC) in the mid-1990s, and its enhanced version in 1999, the Bolivian
public external debt was eligible for two significant debt reduction plans**. After the
successive completion points were reached—in 1998 (under the original HIPC) and in 2001
(under the enhanced version)—, Bolivia received debt rescheduling and forgiveness that
helped reduce its external debt, in NPV and nominal terms. This improved the country's
solvency substantially, and brought the external debt service to more manageable levels.

3.   **However, continued fiscal financing needs and limited capacity to generate
foreign exchange led to a gradual rebuilding of Bolivia's external indebtedness**.
Although at better comparative levels vis-à-vis exports and GDP, at the end of 2005 the stock
of nominal debt was higher than ten years before. The delivery of the MDRI in 2006 has
again improved the outlook for the sustainability of external debt but its preservation will
hinge on future developments in fiscal and structural policies.

External Debt by Type of Creditor
(in millions of U.S. Dollars)
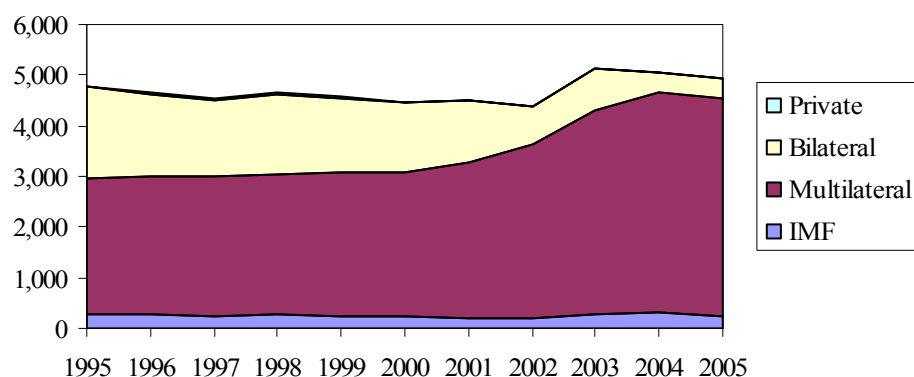
4.   **This chapter provides a look at the external debt after the applications of the
main debt relief plans in the past ten years.** Section A covers the delivery of the main debt
relief initiatives in Bolivia and Section B analyses the current situation and outlook.

A. Impact of Major Debt Relief Initiatives

5. **The delivery of the original HIPC initiative and of its enhanced version allowed Bolivia to reduce its debt burden by US$ 1.7 billion in NPV terms (US$ 2.6 in nominal terms)**. Bolivia reached its completion point under the original HIPC in September 1998. The debt relief commitments under that initiative amounted to US$ 476 million in NPV terms, including additional relief from Japan, 61 percent of which was provided by multilateral institutions. Three years later, under the enhanced HIPC initiative, further assistance was granted for a total of US$1,188 million in NPV terms. Of this total, relief from multilateral and bilateral creditors was provided in similar proportions (in NPV terms). In addition, Paris Club creditors granted debt relief beyond HIPC, by which this group of bilateral creditors conceded relief that would help reduce Bolivia's debt further than that required by the HIPC parameters. The latter amounted to US$ 629 million in nominal terms.

6. **The implementation of the HIPC commitments significantly improved Bolivia's external solvency by reducing the ratio of NPV of debt to exports, from 252 percent in 1997 to 138 percent in 2001, before debt relief beyond HIPC**. In flow terms, this relief helped reduce quickly the debt service to more manageable levels, thanks to the front-loading of the original HIPC relief. Initially, savings amounted to about 1 percent of the GDP per year in the first three years and about 0.5 percent of GDP in subsequent years. Later on, the enhanced HIPC relief and the relief beyond HIPC increased savings to almost 2 percent of the GDP per year. Thus, debt service came down from more than 30 percent of exports before the HIPC initiative to less than 15 percent by 2005.

Estimated Debt Relief Under Both HIPC Initiatives
(In millions of U.S. dollars)

Creditor	Original HIPC		Enhanced HIPC	
	NPV	Nominal	NPV	Nominal
Multilateral	291	406	585	941
IADB	155	253	140	214
WB	54	65	55	63
IMF	29	31	312	565
Others	53	57	78	99
Bilateral	185	382	603	835
Private	0	0	0	0
Total	476	788	1,188	1,776

Source: Bolivian authorities.

7. **Although the two HIPC plans had a direct positive impact on the sustainability of the Bolivian external debt, the fiscal stance kept external financing requirements high, which over time led to the rebuilding of the nominal debt stock**. Indeed, the debt stock reached all-time highs in 2002-03. During the period 1998-2005, Bolivia received

disbursements of about US$ 4.3 billion, mainly from multilateral institutions (76 percent), notably from CAF (US$ 1.3 billion). Since most of these new loans were granted under concessional terms, the NPV of the debt stock did not build up as quickly as the nominal debt.[1] Moreover, a rapid increase in exports helped maintain solvency ratios at lower levels than those of the pre-HIPC period.
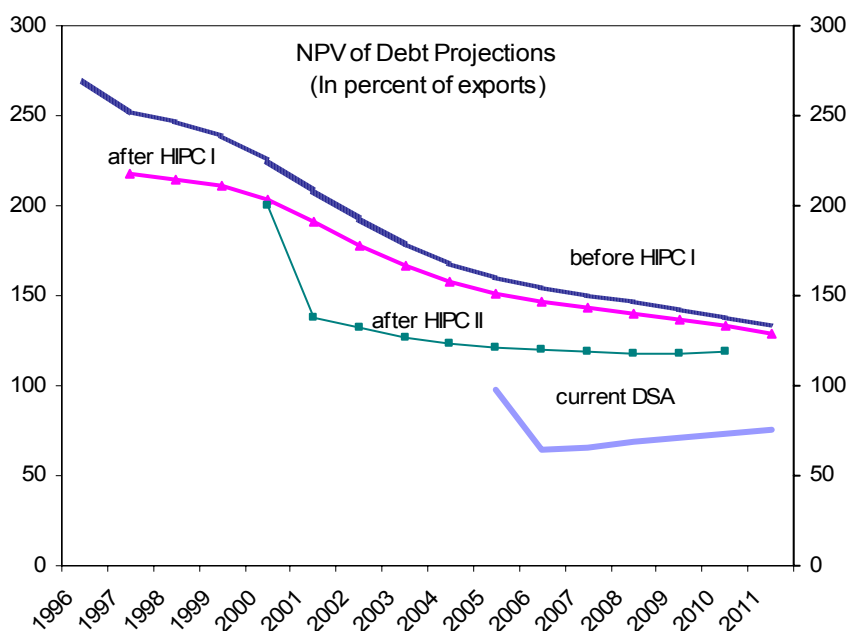
8.   **More recently, the World Bank and the Fund granted Bolivia a new stock of debt reduction under the Multilateral Debt Reduction Initiative (MDRI)**. This G8-sponsored initiative was designed around a concept of a once-and for-all stock of debt forgiveness for HIPC graduates that complied with minimum conditions of macroeconomic stability and public management. Under this initiative, Bolivia has received US$1.7 billion in stock of debt reduction in 2006, US$230 million of which was provided by the Fund in January. This relief, equivalent to about US$ 900 million in NPV terms (or 9.6 percent of GDP), has brought about a further improvement in the external debt indicators, to levels considered compatible with a low risk of debt distress.[2]

9.   **Prompted by the burden-sharing scheme underlying the HIPC initiative, and the granting of relief beyond HIPC by some bilateral creditors, the structure of the Bolivian**

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[1] However, most of the financing from CAF was nonconcessional.

[2] Appendix II of the Article IV consultation report presents an updated Debt Sustainability Analysis incorporating the effect of the MDRI.

external debt has changed significantly in the past ten years, and is at present dominated by the multilateral debt. Thus, while total nominal debt has not changed significantly during the period, debt to multilateral institutions moved from a 62 percent share in 1995 to a 92 percent share at the end of 2005. More recently, the implementation of the MDRI reduced the participation of multilateral institutions to about 87 percent. Debt to private creditors has remained insignificant.

Composition of the External Debt in 1995

0%   6%

38%

U

56%

IMF
MULTILATERAL
BILATERAL
PRIVATE

US$ 4783 million

Composition of the External Debt in 2005

9%   0%   5%

86%

IMF
MULTILATERAL
BILATERAL
PRIVATE

US$ 4941 million
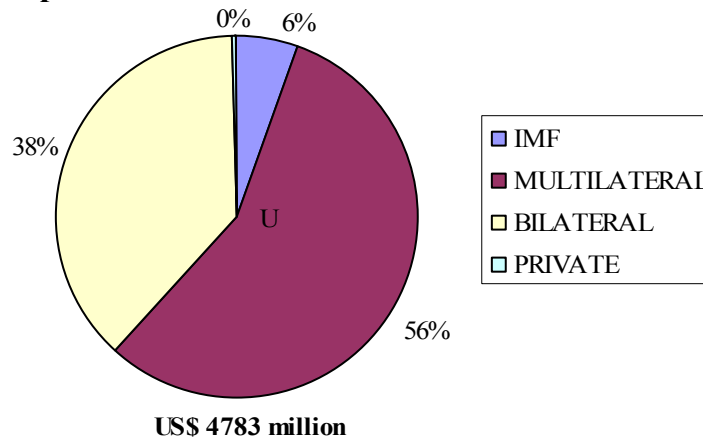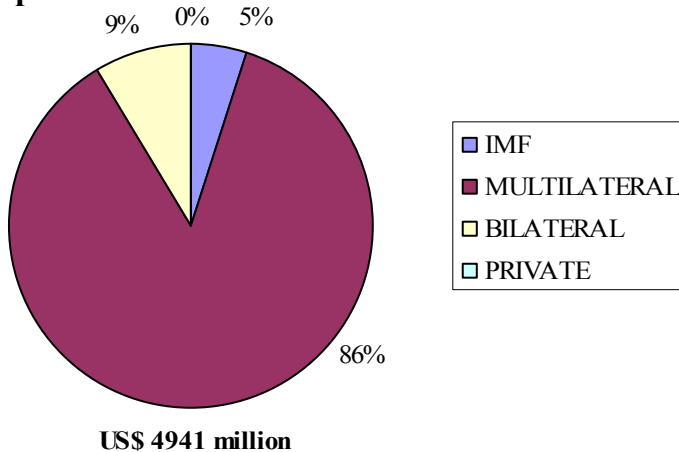
B.   Current Situation and Outlook

10.   **Debt relief plans have moved Bolivia to significantly lower levels of potential debt distress than those prevailing in the mid-1990s and the outlook is positive**. Despite the nominal debt build-up early in this decade, public external debt is currently projected to remain at broadly stable levels around 30 percent of the GDP until the end of the decade. In NPV terms, external debt will be in the 20–25 percent of GDP range, and as a ratio of exports around an average of 70 percent, with a slightly positive trend. Therefore the sustainability of

external debt appears robust at present. Moreover, the new structure of the external debt, given the generally favorable terms of loans from multilateral creditors, also helps an overall encouraging outlook for debt sustainability.

11.   **At the same time, there are additional factors stemming from the strong external sector performance in recent years that help strengthen Bolivia's debt sustainability**. The significant improvement of the external current account, associated with the booming exports of hydrocarbons and mining products, has allowed a rapid accumulation of official reserves, to the record level of US$ 2.3 billion at present. As a result, the external debt net of international reserves has improved, from 49 percent of the GDP in 2003 to less than 10 percent of GDP at present, and is expected to remain stable over the medium term. Also, from a fiscal point of view, the maintenance of a strong Boliviano—as expected given the trends in the external sector—would help to keep debt service at affordable levels.

Net External Debt
(In percent of GDP)
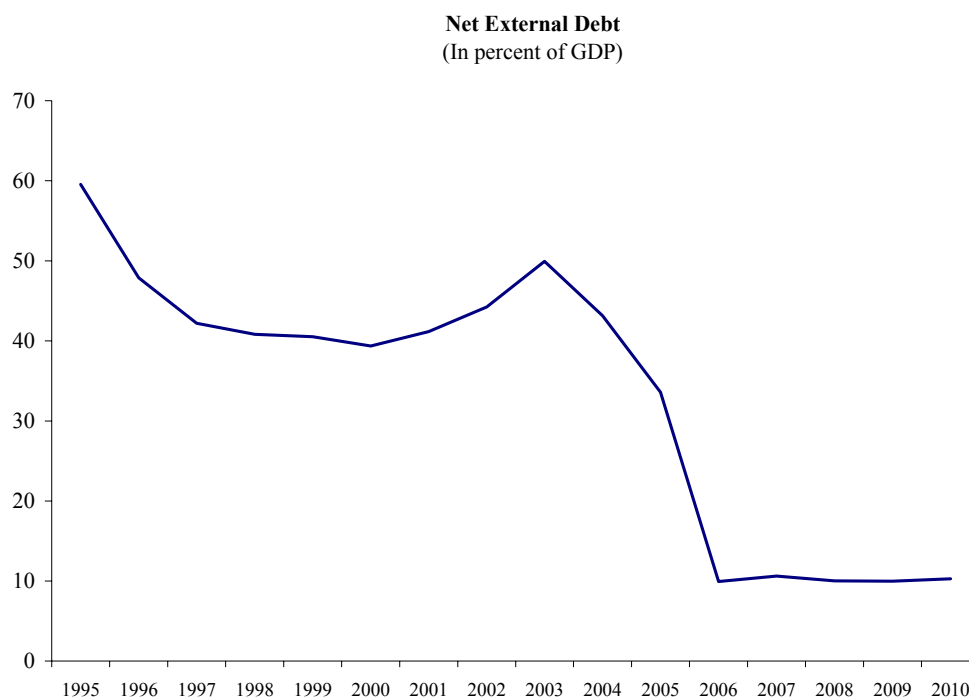
12.   **In addition, the average maturity of the outstanding debt balance remains at suitable levels.** Since the debt forgiven under the MDRI was mostly of very long term nature, its delivery contributed to shorten somewhat the overall average maturity of the outstanding debt. While the remaining debt left is of shorter maturity, it still stands at 11 years. The degree of concessionality of future new borrowing will determine if this indicator recovers to pre-MDRI levels. At the same time, since the amounts written off by the World Bank were all on very concessional terms, the proportion of concessional outstanding loans in the total stock has decreased, from 76 percent at end-2005 to about 63 percent.

Average Life of External Debt
(in years)

	2005	After MDRI
Multilateral	12.5	11.2
Bilateral	9.9	9.9
Total	12.3	11.0

Source: Fund staff estimates.

13.   **Although the current debt indicators point to limited vulnerability from this source, debt management policy must ensure that new borrowing remains within prudent guidelines**. In order to avoid the erosion of the recently improved solvency, the decisions on new external borrowing should take into account not only the levels of concessionality but also the overall amount of new net financing and, more importantly, the feasibility and priority of the underlying projects.

Table 1. Outstanding External Public Debt by Main Creditors, 1995–2005
(In millions of U.S. dollars)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	4,783	4,643	4,532	4,659	4,573	4,460	4,497	4,400	5,142	5,045	4,942
Multilateral	2,944	3,002	3,011	3,024	3,073	3,077	3,261	3,637	4,318	4,662	4,520
IDB	1,453	1,435	1,447	1,381	1,397	1,393	1,374	1,450	1,627	1,658	1,623
World Bank /IDA	847	892	956	1,068	1,106	1,096	1,147	1,323	1,571	1,749	1,667
CAF	263	282	246	198	209	255	421	577	741	837	871
IFAD	34	36	37	39	38	37	35	36	41	44	41
NDF	6	6	5	6	8	9	10	13	16	18	25
FONPLATA	57	58	57	55	54	50	47	23	27	33	33
IMF	268	277	248	264	247	220	207	195	277	306	244
OPEC	13	13	12	11	14	16	20	19	18	17	17
BIAPE	3	2	2	2	2	1	1	1	1	1	1
Bilateral	1,819	1,621	1,503	1,607	1,484	1,372	1,227	757	821	383	422
Austria	97	89	80	80	68	63	1	0	0	0	0
Belgium	158	150	131	126	62	58	55	0	0	0	0
Brazil	22	22	22	22	22	22	33	56	73	87	122
Canada	0	0	0	4	3	6	10	4	1	0	0
China, P.R.	16	22	25	25	24	23	21	19	16	14	29
Denmark	14	1	1	1	1	1	1	0	0	0	0
France	99	63	60	61	45	41	38	16	17	17	13
Germany	466	427	394	410	356	325	306	7	10	39	34
Italy	64	66	67	68	69	67	64	3	4	10	10
Japan	547	526	469	529	587	523	464	513	568	72	63
Korea	0	0	0	0	0	0	0	0	0	1	5
Netherlands	52	29	25	25	14	13	12	0	0	0	0
Spain	100	122	122	142	139	142	138	135	131	143	139
Sweden	0	0	0	2	2	2	2	0	0	0	0
Taiwan	20	18	15	13	10	8	5	3	0	0	0
United Kingdom	56	29	29	29	19	18	18	0	0	0	0
United States	105	56	60	71	61	60	59	0	0	0	0
Venezuela	0	0	0	0	0	0	0	0	0	0	6
Others	4	1	3	0	0	0	0	0	0	0	0
Private	20	20	18	28	16	11	8	6	3	0	0
Memorandum items:											
Nominal debt in percent of:											
GDP	71.3	62.9	57.2	54.9	55.3	53.2	55.2	55.6	63.5	57.7	52.8
Exports	444.9	410.2	388.5	422.0	435.1	357.9	350.0	338.8	321.8	235.1	185.0
Government Revenue	368.7	305.7	285.2	237.5	237.1	232.7	244.3	250.1	300.3	237.9	179.8

Sources: Central Bank of Bolivia; and Global Government Indicators.

Table 2. External Public Debt Service, 1996-2005
(In millions of US dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	353	443	389	249	268	249	258	273	287	368
Multilateral	280	369	324	194	200	196	236	251	274	348
IDB	133	129	159	94	97	87	87	106	108	99
World Bank /IDA	41	34	25	16	13	1	12	14	20	21
CAF	63	151	88	51	58	75	113	104	116	174
IFAD	3	3	3	1	2	2	0	0	0	2
NDF	0	0	0	0	0	0	0	0	0	0
FONPLATA	9	13	10	6	8	7	4	4	4	4
IMF	28	36	36	24	21	21	18	22	24	46
OPEC	2	2	2	2	2	2	1	1	1	1
BIAPE	0	0	0	0	0	0	0	0	0	0
Bilateral	71	71	63	50	62	50	19	18	11	20
Austria	1	1	0	0	1	0	0	0	0	0
Belgium	5	3	3	1	1	0	0	0	0	0
Brazil	0	0	0	0	0	0	0	1	2	12
Canada	0	0	0	1	1	1	2	3	1	0
China, P.R.	0	0	0	1	1	2	2	3	2	3
Denmark	0	0	0	0	0	0	0	0	0	0
France	4	3	3	2	3	2	2	2	3	3
Germany	8	8	9	10	9	5	2	0	0	0
Italy	1	1	3	3	3	4	0	0	0	0
Japan	34	33	23	10	17	16	0	0	0	0
Korea	0	0	0	0	0	0	0	0	0	0
Netherlands	3	2	2	1	1	0	0	0	0	0
Spain	7	9	10	13	17	12	11	6	2	2
Sweden	0	0	0	0	0	0	0	0	0	0
Taiwan	3	3	3	3	3	3	3	3	0	0
United Kingdom	2	1	2	2	0	0	0	0	0	0
United States	3	5	4	4	4	3	0	0	0	0
Venezuela	0	0	0	0	0	0	0	0	0	0
Others	1	1	1	0	0	0	0	0	0	0
Private	2	3	2	4	6	4	3	3	3	0
Memorandum items:										
Debt service to exports	31.1	38.0	35.2	23.7	21.5	19.4	19.9	17.1	13.4	13.8
Debt service to revenues	23.2	27.9	19.8	12.9	14.0	13.5	14.7	15.9	13.5	13.4

Source: Central Bank of Bolivia.

Table 3. External Public Debt Disbursements, 1996-2005
(In millions of U.S. dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	413	422	366	303	305	485	542	702	552	448
Multilateral	334	381	292	271	264	436	495	680	462	365
IDB	111	116	117	90	96	84	99	195	92	111
World Bank/IDA	101	137	88	82	61	102	104	142	124	70
CAF	60	92	33	65	84	216	289	241	180	155
IFAD	6	5	3	3	3	1	1	3	2	3
NDF	0	0	0	3	1	2	2	2	1	8
FONPLATA	6	7	4	2	1	1	1	6	8	2
IMF	49	23	46	22	15	24	0	89	55	15
OPEC	1	1	0	5	3	6	0	0	0	1
BIAPE	0	0	0	0	0	0	0	0	0	0
Bilateral	76	35	62	33	41	49	47	22	90	83
Austria	0	0	0	0	0	0	0	0	0	0
Belgium	0	0	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	12	23	17	36	42
Canada	0	0	4	0	3	5	2	0	0	0
China, P.R.	5	4	0	0	1	0	0	0	0	22
Denmark	0	0	0	0	0	0	0	0	0	0
France	1	3	2	3	0	0	0	0	1	1
Germany	29	12	18	16	17	13	11	1	28	0
Italy	0	3	2	6	2	1	2	0	5	1
Japan	5	1	1	1	4	11	0	0	0	0
Korea	0	0	0	0	0	0	0	0	1	4
Netherlands	0	0	0	0	0	0	0	0	0	0
Spain	25	4	24	6	15	6	10	3	20	7
Sweden	0	0	0	0	0	0	0	0	0	0
Taiwan	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0	0	0	0
United States	9	5	11	0	0	0	0	0	0	0
Venezuela	0	0	0	0	0	0	0	0	0	6
Others	2	3	0	0	0	0	0	0	0	0
Private	3	6	12	0	0	0	0	0	0	0
Memorandum item:										
Disbursements (in percent of GDP)	5.6	5.3	4.3	3.7	3.6	6.0	6.9	8.7	6.3	4.8

Source: Central Bank of Bolivia.

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