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The global financial crisis: effects on Bolivia

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Institute for Advanced Development Studies



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No. 03/2009

The Global Financial Crisis: Effects on Bolivia

by:

Luis Carlos Jemio
Osvaldo Nina

May 2009

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Global Financial Crisis Discussion Series Paper 3: Bolivia¹

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May 2009

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Contents

Tables and figures	iii
Acronyms	iv
Abstract	v
1. Background	1
2. Transmission mechanisms of the global financial crisis	2
2.1 Exports	2
2.2 Remittances	5
2.3 Foreign aid	7
2.4 Capital flows	7
2.5 Summary of transmission mechanisms	8
3. Sectoral effects of the global financial crisis	9
3.1 Effects of shocks on economic growth	9
3.2 Income effects of external shocks	10
3.3 Monetary effects of shocks	11
3.4 Effects of shocks in the functioning of the financial system	14
3.5 Effects of shocks on the real exchange rate	19
3.6 Effects of shocks on the fiscal balance and debt	20
4. Identification and assessment of likely shocks that will affect the Bolivian economy	23
5. Potential policy responses	25
5.1 Fiscal policy	25
5.2 Exchange rate policy	25
5.3 Monetary policy	26

Figures and tables

Figure 1: Sectoral distribution of Bolivian GDP (%)	2
Figure 2: World price of oil and export price of natural gas, 2003-2009 (US\$/m ³)	3
Figure 3: World prices of zinc and tin, 2000-2009 (US\$/tonne)	3
Figure 4: Total exports by activity sector (US\$m)	4
Figure 5: Exports in current and constant prices (US\$m)	5
Figure 6: Sectoral exports in constant 2000 prices (US\$m)	5
Figure 7: Remittances from abroad (US\$m)	7
Figure 8: Unilateral official transfers (aid), 2000-Jun 2008 (US\$m)	7
Figure 9: Net capital flows (US\$m)	8
Figure 10: GDP growth by expenditure category (%)	9
Figure 11: GDP growth by activity sectors, 2004-2008 (%)	9
Figure 12: Per capita national income (US\$ per person)	10
Figure 13: Imports (US\$m)	11
Figure 14: Current account balance (US\$m)	11
Figure 15: Foreign exchange reserves, 2004-2009 (US\$m)	12
Figure 16: Inflation and monetary aggregates, 2003-2008 (% growth rates)	12
Figure 17: Velocity of money for different monetary aggregates, 2004-2008	13
Figure 18: Money multiplier and the preference for liquidity, 2003-2008	13
Figure 19: Currency and OMOs, 2003-2008 (US\$m)	14
Figure 20: Investment and funding from abroad (%)	15
Figure 21: Official, inter-bank and market exchange rate, 2007 and 2008 (Bs per US\$)	16
Figure 22: Evolution and currency composition of savings	17
Figure 23: Bank and non-bank loans and deposits	18
Figure 24: Annual growth rate of loan types, 2007-2009 (%)	18
Figure 25: Non-performing loan, loan loss reserve and total loan, 2007-2009 (%)	19
Figure 26: Real multilateral exchange rate, 2003-2008	20
Figure 27: General government cash flows	21
Figure 28: General government's revenues, expenditures and balance, 2003-2008 (% of GDP)	21
Figure 29: Public external debt, 2002-2008 (US\$m)	22
Table 1: External revenues owing to exports and remittances, 2000-2009 (US\$m)	8
Table 2: Composition of institutional savings in Bolivia	14
Table 3: Real exchange rate depreciation (appreciation) by geographic area, 2000-2008 (%)	20
Table 4: Potential impacts of shocks and policies on key macroeconomic variables	23
Table 5: Foreign exchange reserves and central bank liabilities, 2004-2008 (US\$m)	26

Acronyms

Benelux	Belgium, the Netherlands and Luxembourg
BCB	Central Bank of Bolivia
CAN	Andean Community
EIA	Energy Information Administration
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
INE	National Institute of Statistics
INESAD	Institute for Advanced Development Studies
Mercosur	Common Market of the South
MRER	Multilateral Real Exchange Rate
NAFTA	North America Free Trade Agreement
NPL	Non-performing Loans
OMO	Open Market Operation
SBEF	Superintendency of Banks and Financial Entities of Bolivia
UPF	Fiscal Programming Unit

Abstract

The global financial crisis is expected to have a negative impact on the Bolivian economy. Effects will transmit into the economy through lower export prices and quantities, reduced amount of remittances and depressed foreign direct investment (FDI) flows. These shocks will bring about deficits in the current account and fiscal balances, foreign exchange reserves losses, sluggish economic growth and higher unemployment rates. The latest data available show that the economy is already experiencing the effects of the economic downturn, in the form of decreased exports revenues, sharp reductions in the rates of growth of foreign of exchange reserves and bank lending and a tendency towards a re-dollarisation of financial assets and liabilities. The Bolivian economy, however, is better prepared, at least in the short run, to cope with the negative effects of the crisis. The commodity export boom experienced between 2005 and 2008 has permitted the country to run sizable external and fiscal surpluses and accumulate foreign exchange reserves. The financial system has exhibited more prudent behaviour in recent years, by not expanding credit too much and increasing investments in highly liquid public bonds. Therefore, although banks are expected to be affected by the global financial crisis, they have high liquidity ratios and are not extremely exposed to risk.

The capacity of the Bolivian economy to offset the negative effects of the global crisis will depend on several factors, such as the severity and duration of the crisis and, above all, the quality of the policies that policymakers will implement to cope with the crisis. The government faces several trade-offs in implementing policies in order to cope with the effects of the crisis. The central bank, for instance, is committed to maintaining a fixed exchange rate, in order to reduce inflationary pressures and to avoid a re-dollarisation of the financial system. However, a fixed exchange rate policy has already brought about an exchange rate appreciation, which is hurting competitiveness of tradable activities.

Furthermore, the government has room to implement countercyclical fiscal policies, by resorting to the deposits accumulated in the central bank during the export boom years. During 2009, the government is planning to expand public investment and to increase direct transfers to the population. However, these policies are not likely to offset the negative effects that the crisis will have on growth and employment. More efforts should be made to improve the quality of public spending, in order to maximise its impact on economic growth, employment creation and poverty reduction.

1. Background

The Bolivian economy is at a time of transition, between a period with a very favourable external economic environment to one dominated by the international financial crisis, which is expected to bring about important macroeconomic and sectoral impacts in the coming months. The economy has already started to feel the negative impacts of the global crisis, in the form of reduced export prices and quantities and much slower growth.

The transmission mechanisms of the positive shocks the economy has experienced in the recent past will likely also be the mechanisms through which the negative effects of the crisis will transmit into the economic system. These mechanisms will operate through the monetary and financial systems, exchange rate, interest rates and relative prices. The expected outcomes will be lower growth rates, increased unemployment, lower exchange reserves and a return of fiscal and current account deficits. The financial system will likely experience higher rates of non-performing loans (NPLs), reduced lending and lower profits.

However, the positive shocks Bolivia has enjoyed in the past four years have permitted the country to build some capacity to undertake countercyclical policies in order to offset partially the negative effects of the crisis. The commodity boom that took place between 2005 and 2008 has brought about a considerable increase in reserves and permitted the country to revert its chronic fiscal and external deficits. Besides, external public debt has been reduced considerably, through various debt relief initiatives that have benefited the country. During the years of the boom, the banking system adopted a prudent attitude and limited its risk exposure. Conversely, non-banking institutions have expanded their loans to the private sector, and thus are more exposed to risk.

How Bolivia will perform during the period of the global crisis will depend on several factors, such as the severity and duration of the crisis and, above all, the quality of the policies that policymakers implement to cope with the negative effects of the crisis.

This paper analyses the potential effects that the global financial crisis will have on the Bolivian economy, the transmission mechanisms through which the effects of the crisis are expected to permeate into the economic system and the effectiveness of potential policy responses that policymakers could put into place in order to cope with the negative effects of the crisis.

Section 2 of the paper analyses potential transmission mechanisms. Most of the shocks will come through the external sector, namely export revenues (prices and quantities), remittance amounts, external aid and capital inflows, including foreign direct investment (FDI) flows.

Section 3 discusses and assesses the effects that these shocks are expected to produce in the Bolivian economy. These effects will be in terms of gross domestic product (GDP) growth, per capita income, foreign exchange reserves, fiscal and external balances, monetary and financial sectors, real exchange rate appreciation, etc.

Section 4 analyses numerically the potential effects that the shocks will have on key macroeconomic variables, such as growth, fiscal and external balances, reserves and the unemployment rate. These effects are assessed by means of a consistency macroeconomic model constructed for the Bolivian economy.

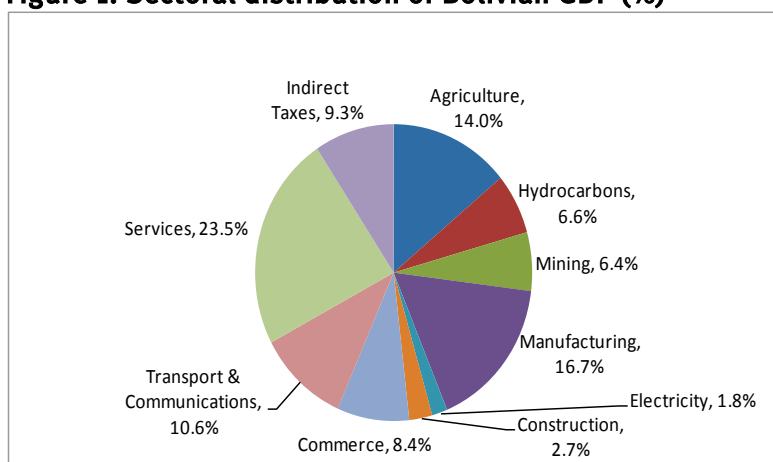
Section 5 discusses potential policy responses that could be considered in order to cope with the negative effects of the crisis. To this end, this section discusses potential policies in the fiscal, monetary and exchange rate areas.

2. Transmission mechanisms of the global financial crisis

From 2004, the Bolivian economy enjoyed a period with an extremely favourable external environment. The conditions of the world economy improved considerably for commodity-exporting countries like Bolivia. International prices of most of the commodities exported by the country showed considerable increases. In addition, a large inflow of remittances further increased availability of foreign exchange resources.

The structure of Bolivia's GDP is divided basically into equal shares between tradable and non-tradable sectors. Non-tradable activities comprise in total 47% of GDP, mainly services (23.5% of GDP), transport and communications (10.6%), commerce (8.4%) and construction (2.7%). Tradable activities comprise 43.7% of GDP, mainly manufacturing (16.7% of GDP), agriculture (14%), hydrocarbons (6.6%) and mining (6.4%).

Figure 1: Sectoral distribution of Bolivian GDP (%)



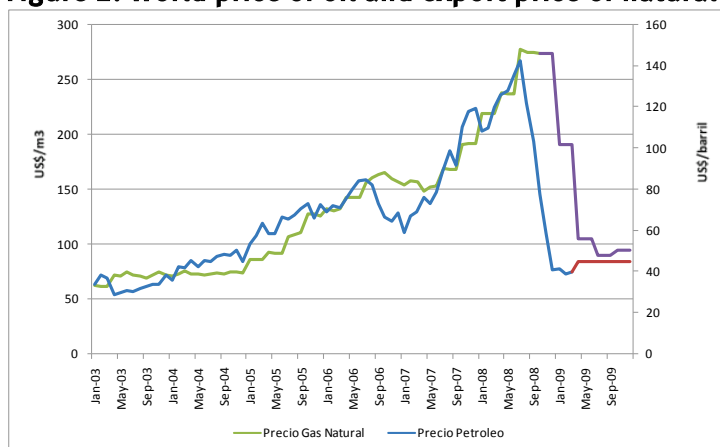
Source: INE national accounts data (www.ine.gov.bo/indice/visualizador.aspx?ah=PCo1o1o3o1.HTM).

2.1 Exports

Bolivia's export structure is concentrated heavily in raw materials, basically hydrocarbons and mining products, which comprised 77.9% of total exports in 2008. Hydrocarbons increased their share in total exports from 29.1% in 2003 to the current 50.1%, owing to both price and quantity increases in natural gas exports. Conversely, agro-industry's and manufacturing's share in total exports diminished from 36.9% in 2003 to 16.6% in 2008. Agro-industry and manufacturing exports basically comprise soya and soya products, wood and wood manufacturing, textiles, Brazil nuts and sugar, among others. Mining has maintained its share in total exports relatively constantly, increasing from 21.9% in 2003 to 27.8% in 2008.

In recent years, export price conditions on world markets have become very favourable for commodity-exporting countries. Bolivia's export prices increased sharply between 2004 and 2008. Hydrocarbon exports saw a substantial price increase, because natural gas export contracts signed with Brazil and Argentina comprised price indexation clauses, by means of which natural gas prices paid by these two countries are indexed to a basket of international prices for fuels. Thus, the sharp increases observed in the international price of oil led to a fourfold increase in Bolivia's hydrocarbon export prices between 2004 and 2008 (Figure 2).

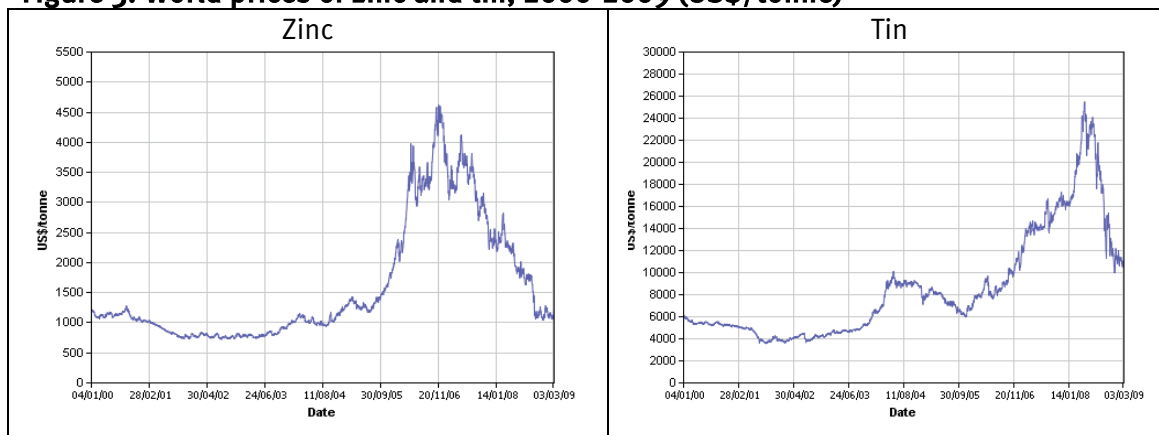
Figure 2: World price of oil and export price of natural gas, 2003-2009 (US\$/m³)



Source: World price of oil, EIA (<http://tonto.eia.doe.gov/dnav/pet/hist/wtotusaw.htm>); export price of natural gas, BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

When the international crisis broke out in 2008, oil prices went down very sharply, but natural gas prices remained high throughout 2008 because of the indexation formula utilised in calculating the natural gas export prices. According to this formula, the quarterly price of exported natural gas is based on the quarterly average lagged value of the international prices of a basket of fuels. On average, natural gas export prices increased from US\$72.4 per thousand cubic metres in December 2003 to \$277.8 in July 2008, representing a 284% rise. However, it is expected that these prices will fall in 2009. If world oil prices are on average \$45 per barrel during 2009, the average export price of natural gas will stay at \$120 per thousand cubic metres, 52% lower than the average price observed in 2008.

Figure 3: World prices of zinc and tin, 2000-2009 (US\$/tonne)



Source: London Metal Exchange (www.lme.co.uk/non-ferrous/index.asp).

Mining export prices also rose significantly from the last quarter of 2005. Zinc, Bolivia's main exported mineral, experienced a 4.7-time increase between the beginning of 2005 and November 2006, decreasing since to the levels observed in 2004 (Figure 3). Tin exhibited a 4.3-time price increase between September 2005 and June 2007, when prices reached their peak. Thereafter, tin prices went down by 57%. The downward trend in international prices led the mining sector to feel the effects of the international crisis. Pink OTC Markets Inc. forecasts that the world price of zinc will reduce on average by 36% in 2009, that for tin by 38%, silver by 24% and gold by 1.5%.² In 2008, these four metals comprised 87% of Bolivia's mining exports. Thus, the forecast weighted average price drop in total mining exports will be 30% in 2009.

Manufacturing and agro-industry exports benefited from price increases as well, albeit not of the same magnitude as those exhibited in mining and hydrocarbons. On average, prices for this export category

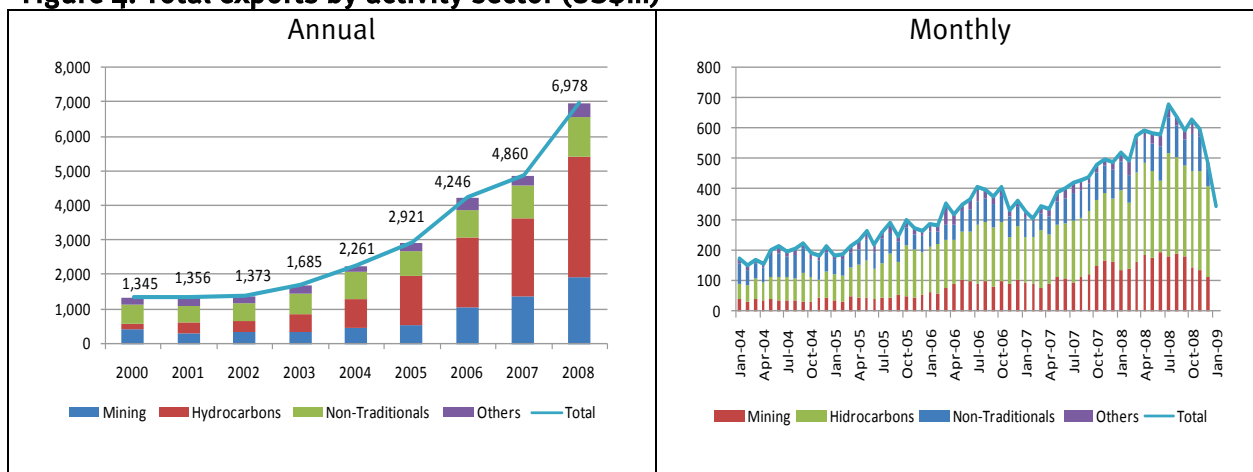
² www.bmonesbittburns.com/economics/goods/current/.

increased by 92% between December 2003 and August 2008. Pink OTC Markets Inc. forecasts that world prices for most of Bolivia's agro-industry exports will reduce significantly in 2009. Namely, prices of soya beans and soya by-products are forecast to go down by between 21% and 37%, wood and wood products by 27% and coffee by 8.2%.

Price increases of the magnitude described above have had a considerable impact on Bolivia's export revenues (Figure 4). The total exported value went up from US\$2.3 billion in 2004 to \$6.9 billion in 2008, representing a more than 200% increase. Hydrocarbons exports explain the bulk of the rise in export revenues, increasing share in total exports from 29% in 2003 to 50% in 2008. Mining exports' share in total exports presented a more moderate increase, from 21.9% in 2003 to 27.8% in 2008. The share of agro-industry and manufacturing in total export revenues went down from 36.9% in 2003 to 16.6% in 2008.

Analysis of monthly data shows that exports have begun to experience the negative effects of the international crisis. The upward trend exhibited by the monthly value of export revenues represented a turning point in July 2008, when they reached their maximum value of US\$680 million. Thereafter, the monthly value of exports reduced steadily, reaching a value of \$346 million in January 2009, the lowest since April 2007.

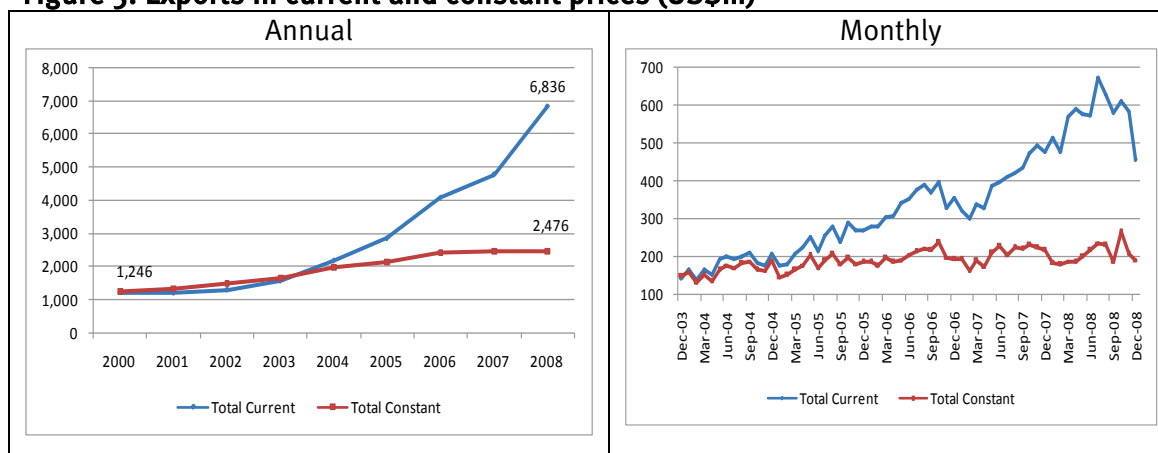
Figure 4: Total exports by activity sector (US\$m)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo); INE (www.ine.gov.bo:8082/comex/make_table.jsp?query=comex).

This impressive rise in export revenues between 2004 and 2008 is explained primarily by price increases, since volumes showed a relatively more modest performance. Figure 5 presents the value of total exports in current and constant prices of 2000, showing that the volumes exported in 2008, valued at prices of 2000, would have amounted to US\$2.5 billion. This gives us an idea about the extent of export revenue reductions expected in the coming months as a result of the commodity price drops brought about by the international crisis.

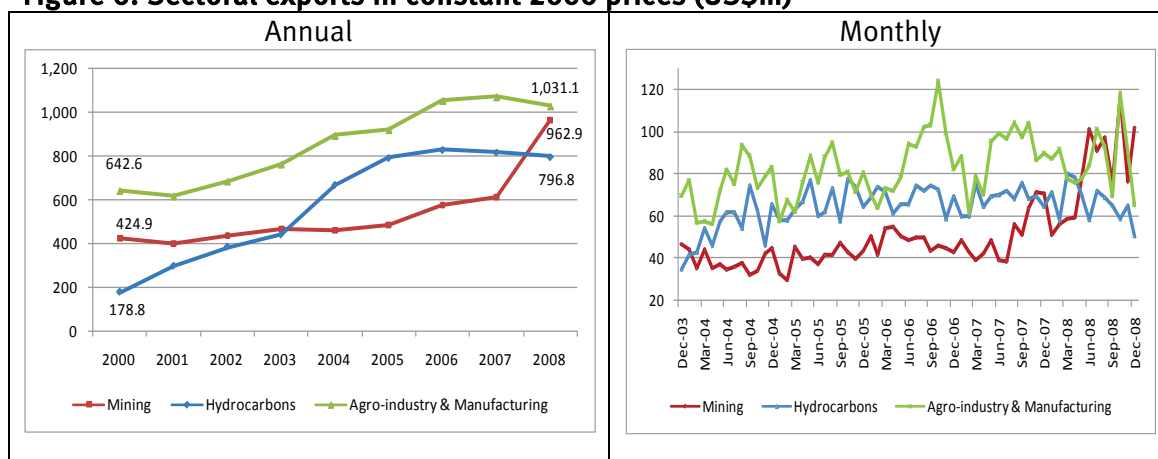
Figure 5: Exports in current and constant prices (US\$m)



Source: INE (www.ine.gov.bo:8082/comex/make_table.jsp?query=comex).

Although the impressive export value increases are explained basically by higher international prices, volumes have also seen significant boosts (Figure 6). Mining export volumes, for instance, doubled between 2003 and 2008. The bulk of this increase is explained by one single project, the San Cristobal mine, which entered into operations in the last quarter of 2007. In the same period, hydrocarbons export volumes went up by 80%, when the natural gas export project to Brazil entered into full operation. Finally, agro-industry and manufacturing export volumes went up by 35% during the same period, because of the more favourable conditions observed on international markets. In 2008, however, some of the effects of the global crisis on export volumes had begun to be felt. Agro-industry and manufacturing export volumes reduced by 3.9% in 2008. On the other hand, natural gas exported quantities reduced by 2.6% in 2008, because of production capacity constraints. In addition, Brazil has decided to cut short its imports of natural gas from Bolivia by one-third, because the good rainy season has increased its capacity to produce hydroelectricity.

Figure 6: Sectoral exports in constant 2000 prices (US\$m)



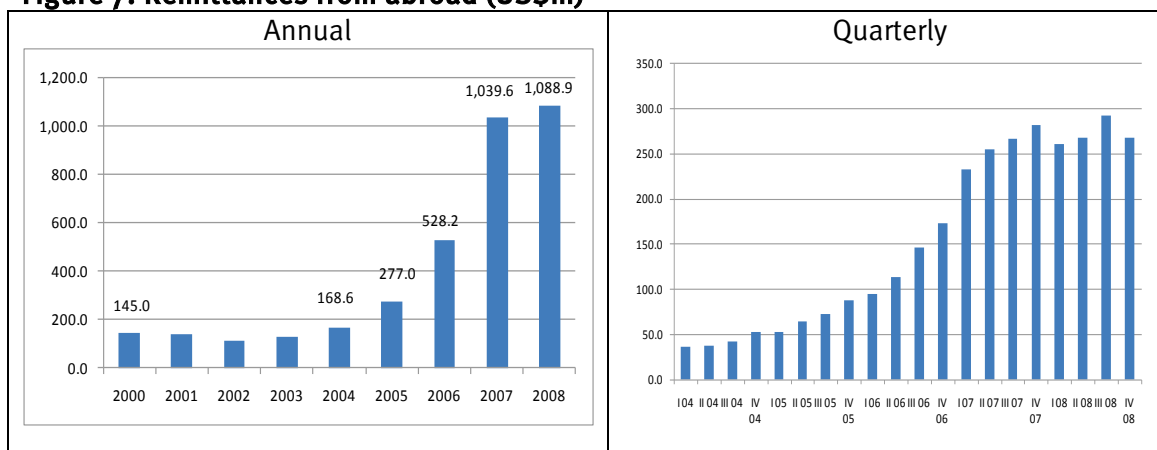
Source: Author calculations based on data published by INE (www.ine.gov.bo:8082/comex/make_table.jsp?query=comex).

2.2 Remittances

Remittances by Bolivian citizens living abroad have become another important source of foreign exchange revenue in Bolivia in recent years. Balance of payments figures show that the value of private unilateral transfers increased from US\$168.6 million in 2004 up to \$1.1 billion in 2008 (Figure 7). This shows that large migration flows of Bolivians to other countries have intensified in the past few years. The largest increase in remittances occurred in 2007, when their value went up by 96%. In 2008, remittances increased by only 4.7%. Quarterly data show that the upward trend observed in remittances between 2004 and 2007 reached a turning point in 2008, when they began to reduce

because of the higher unemployment rates in developed countries resulting from the global financial crisis. Preliminary calculations by Cali (forthcoming) estimate that the expected reduction in remittances for a developing country from Latin America like Bolivia, owing to the international financial crisis, will be equivalent to 11% of their current value.

Figure 7: Remittances from abroad (US\$m)

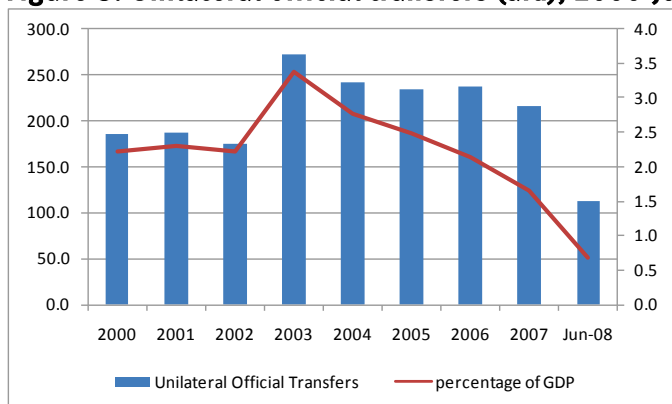


Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

2.3 Foreign aid

Prior to the commodity export boom, Bolivia was heavily dependent on international aid. In 2003, aid flows amounted to US\$272 million, equivalent to 3.4% of GDP (Figure 8). Thereafter, aid flows went down continuously, at \$215 million in 2007 (only 1.6% of GDP). This pattern is likely to have continued during 2008. The improved fiscal stance resulting from the increased gas rent explains why the Bolivian government resorted less to aid flows to finance public expenditures. Therefore, it is very likely that the foreseen reduction in government revenues that will result from the international crisis will reinstate the need for aid flows by the government.

Figure 8: Unilateral official transfers (aid), 2000-Jun 2008 (US\$m)

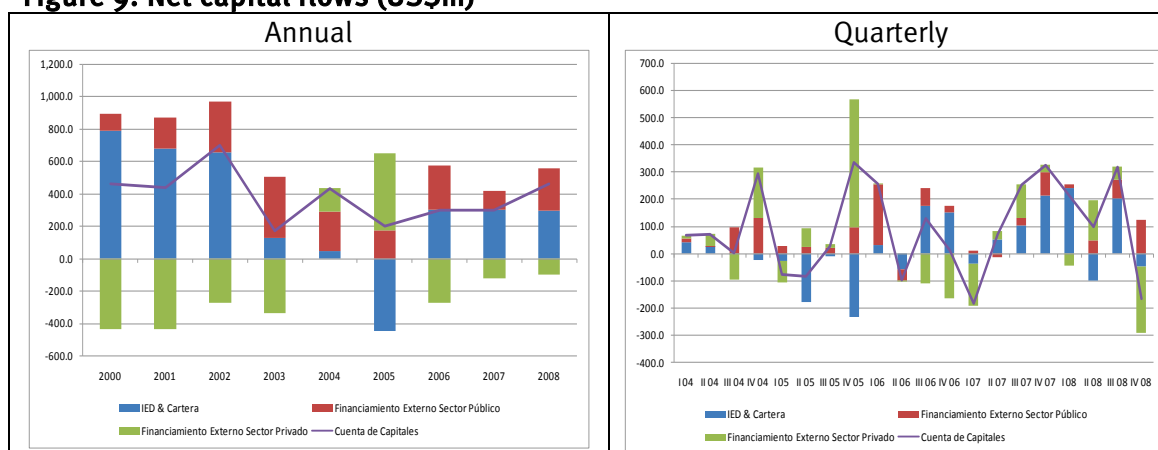


Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

2.4 Capital flows

Unlike the current account balance, the capital account balance has shown far less dynamic behaviour in recent years. Figure 9 shows that, between 2004 and 2008, the net value of capital inflows varied between US\$200 million and \$500 million a year. FDI and portfolio investment flows recovered partially after experiencing significant reductions in years 2003 through 2005, and stood at about \$300 million during the period 2006-2008. Capital flows received by the public sector stood at on average \$200 million a year during 2004-2008. Finally, other private capital flows, such as bonds and cross-border bank lending, were negative, at about \$160 million a year on average during 2006-2008. Quarterly data show that this type of private capital flow became sharply negative in the last quarter of 2008, amounting to a net outflow of \$243 million, resulting from external portfolio investments by banks.

Figure 9: Net capital flows (US\$m)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

2.5 Summary of transmission mechanisms

Bolivia's external revenues owing to exports and remittances, which in recent years have exhibited significant increases owing to the commodity boom in world markets and increased flows of migrants to developed countries, are likely to decrease in 2009 as a result of the international financial crisis. Between 2004 and 2008, external revenues rose by approximately U\$5.6 billion owing to export and remittance increases. Considering only forecast commodity price reductions for 2009, carried out by Pink OTC Markets Inc., the expected drop in external revenues Bolivia will face this year amounts to at least \$3 billion (Table 1). Most of this reduction will be explained by the drop expected in natural gas export revenues, which could be of at least \$1.8 billion.

Table 1: External revenues owing to exports and remittances, 2000-2009 (US\$m)

	2000	2004	2008	Forecast change 2009	Forecast change 2004-2008	Forecast change 2008-2009
Exports	1344.9	2261.1	6978.3	4138.6	4717.2	-2839.6
Mining	425.1	455.8	1939.6	1357.7	1483.8	-581.9
Hydrocarbons	165.8	838.9	3494.1	1677.2	2655.2	-1816.9
Agro-industry and manufacturing	546.5	788.6	1146.9	871.1	368.3	-285.7
Others	207.5	177.8	387.7	232.6	209.9	-155.1
Remittances	145.0	168.6	1088.9	925.5	920.3	-163.3
Total exports and remittances	1489.9	2429.7	8067.2	5064.2	5637.5	-3003.0

Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo) and own forecasts based on price forecasts by Pink OTC Markets Inc. (www.bmonesbittburns.com/economics/goods/current/).

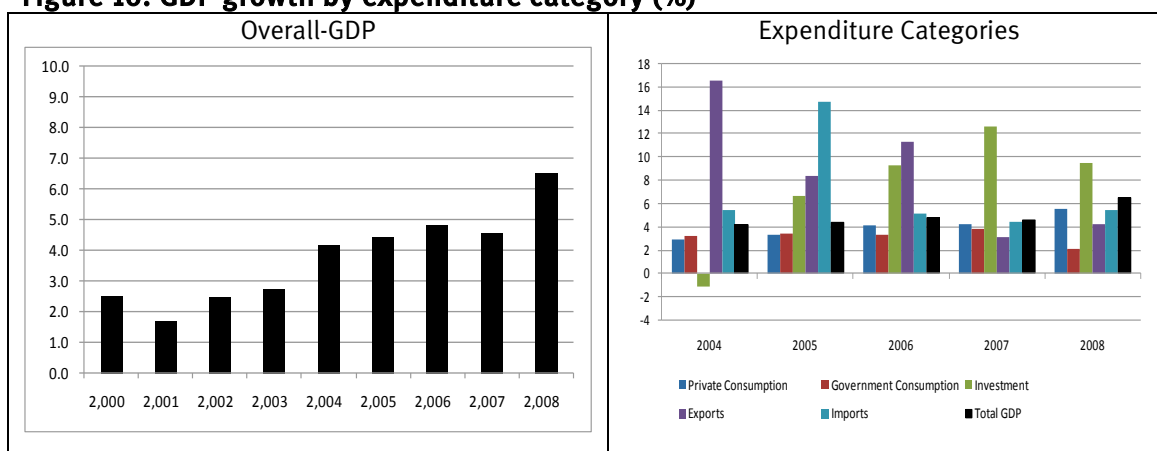
3. Sectoral effects of the global financial crisis

The positive external shocks experienced by Bolivia in the past four years and the negative shocks that the global financial crisis will bring about in the coming months have transmitted and will transmit into the economy through different channels and mechanisms, such as the exchange rate, interest rates, relative prices, per capita income, aggregate demand, the financial system, etc.

3.1 Effects of shocks on economic growth

Growth slowed down substantially during the first half of the 2000s, but picked up starting from 2004. In 2006, the GDP growth rate stood at 6.2% (Figure 10). The main drivers of economic growth were exports and investment.

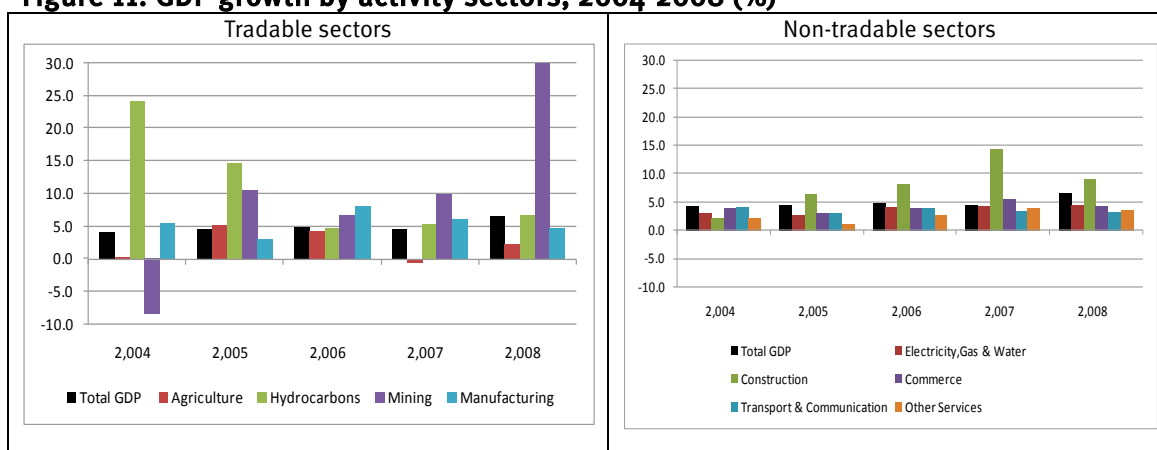
Figure 10: GDP growth by expenditure category (%)



Source: INE (www.ine.gov.bo/indice/indice.aspx?d1=01&d2=4).

Growth at the sectoral level was driven primarily by three sectors: mining and hydrocarbons, among tradable activity sectors, and construction (Figure 11).

Figure 11: GDP growth by activity sectors, 2004-2008 (%)



Source: INE (www.ine.gov.bo/indice/visualizador.aspx?ah=PC01010301.HTM).

In the near future, it is expected that economic growth will decelerate, because of the external shocks resulting from the international crisis. Exports are expected not only to stagnate in the coming months, but could experience decreases. Hydrocarbons exports have already evidenced a downward trend in the past year because of production constraints. Besides, as highlighted previously, Brazil is trying

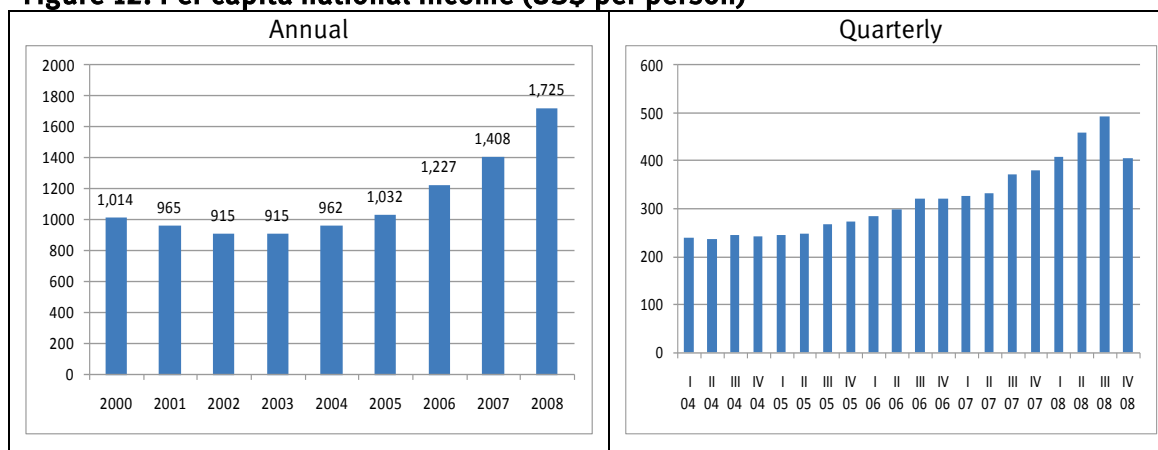
hard to reduce imports of natural gas from Bolivia, as it has discovered sizable reserves of oil and natural gas. Argentina will experience the effects of the crisis as well and most likely restrain imports. Therefore, in order to compensate for the negative effects that reduced growth in export activities will have on overall economic growth, the government most likely will pursue an expansive countercyclical fiscal policy, by increasing the rate of growth of public expenditures, both current and capital.

3.2 Income effects of external shocks

As a result of higher external revenues and transfers from abroad in the form of remittances, per capita income has increased sharply over the past three years, rising from US\$962 per person in 2004 to \$1725 per person in 2008 (Figure 12).

By analysing quarterly data, it is possible to observe that the international crisis had already had a significant effect on per capita income in the last quarter of 2008, owing to the reduced values of remittances and per capita GDP:

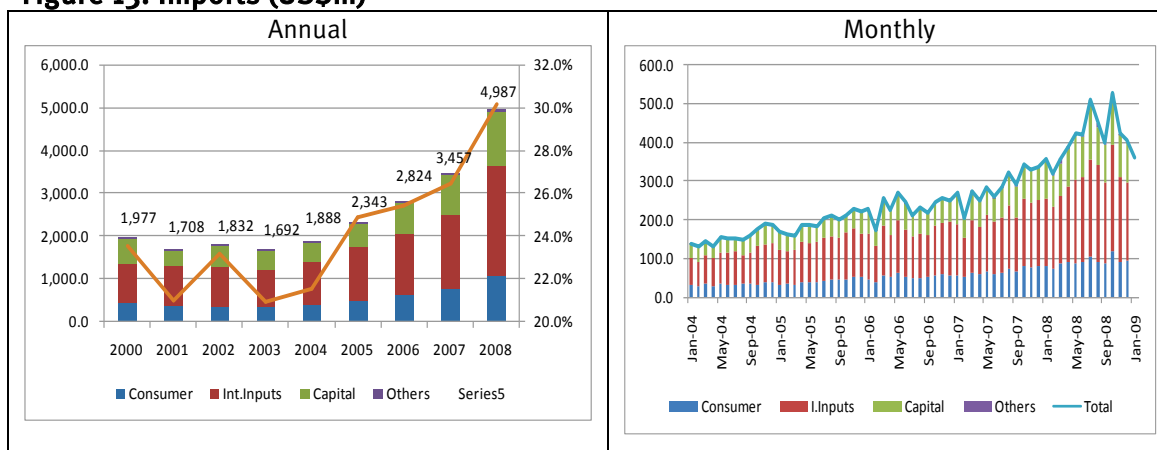
Figure 12: Per capita national income (US\$ per person)



Source: INE (www.ine.gov.bo/indice/indice.aspx?d1=01&d2=4).

The higher GDP and per capita income level brought about an increase in imports, which increased by 164% between 2004 and 2008 (Figure 13). However, the average propensity of the economy to import increased as well, rising from about 22% in 2004 to 30% in 2008. This was positively affected also by the exchange rate appreciation over recent years, which contributed towards making imported goods cheaper relative to domestically produced ones. The import category that presented the larger increase was intermediate inputs, owing to the higher value of imported diesel oil, as a result of the higher prices of oil on the world market. Capital goods imports also saw a significant increase. The large imports of cars and other vehicles utilised in public transportation, mainly second-hand vehicles, basically explain the larger imports of capital goods.

Figure 13: Imports (US\$m)

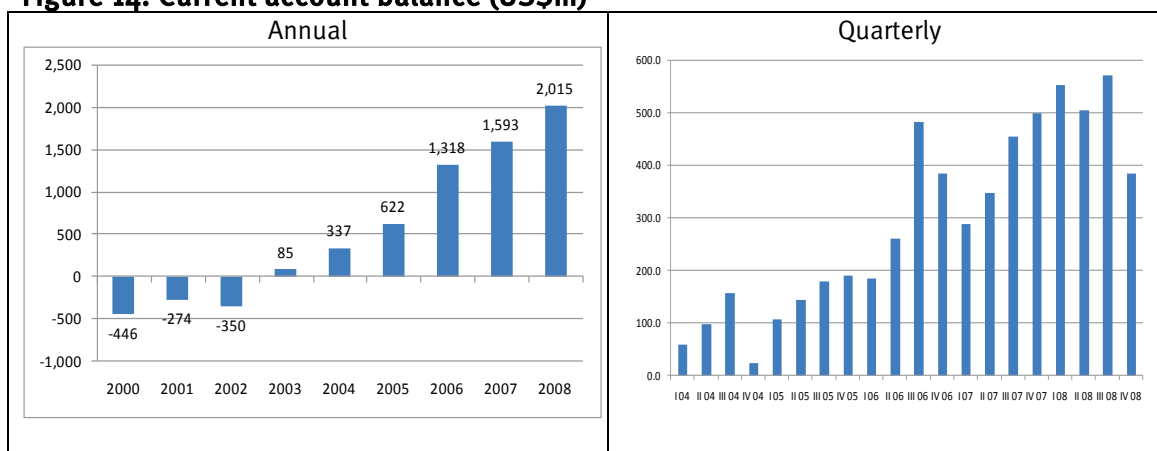


Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo) and INE (www.ine.gov.bo:8082/comex/make_table.jsp?query=comex).

Analysis of monthly data shows that imports also saw a downward trend in the last months of 2008 and in January 2009. The income effect referred to before could be already causing imports to decrease owing to the international crisis.

Despite the large increased value of imports, the current account balance presented surpluses starting from 2003, reversing Bolivia's historical chronic deficits. In 2008, the surplus reached US\$2 billion, equivalent to 12% of GDP (Figure 14). Quarterly data show that the upward trend observed in the current account balance over the past years reversed in the last quarter of 2008, owing to reduced values of exports and remittances.

Figure 14: Current account balance (US\$m)

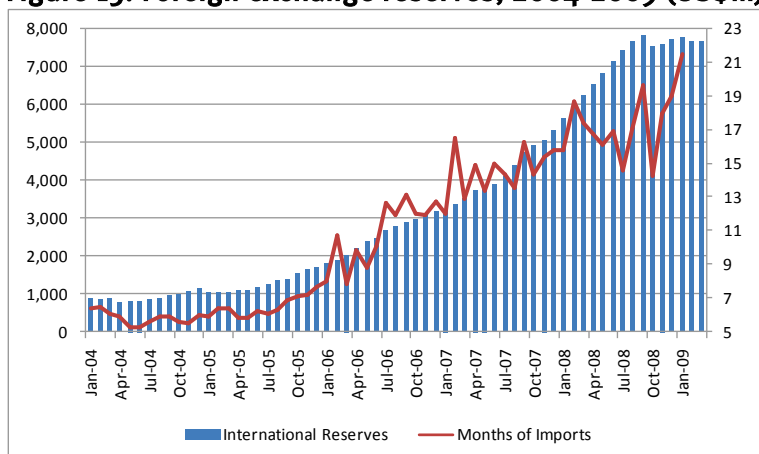


Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

3.3 Monetary effects of shocks

One of the key transmission mechanisms of the external shocks into the economy will be through the monetary and financial sectors. The large inflows of external resources, through the current account balance, have helped the country to accumulate sizable amounts of foreign exchange reserves. As can be observed in Figure 15, net foreign exchange reserves increased from US\$1 billion at the end of 2004 to \$7.8 billion in September 2008. The latter figure is equivalent to 20 months of imports. Thereafter, however, reserve increases halted and even showed some reductions. By mid-March 2009, foreign reserves had reduced to \$6.6 billion.

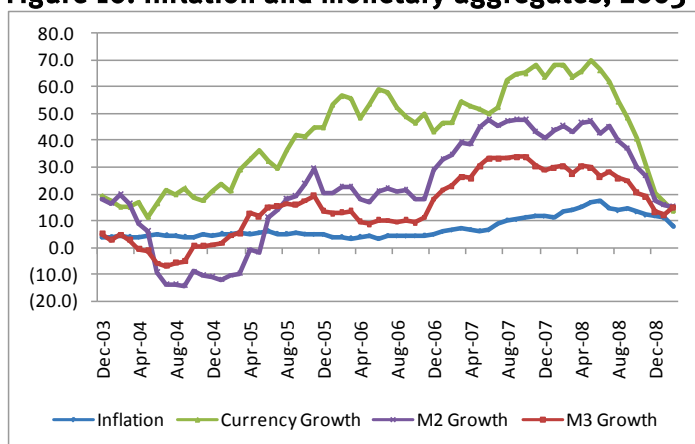
Figure 15: Foreign exchange reserves, 2004-2009 (US\$m)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo) and INE (www.ine.gov.bo:8082/comex/make_table.jsp?query=comex).

The large increase of foreign exchange reserves has had as a counterpart a large expansion in monetary aggregates. Currency in circulation, for instance, increased at annual rates, in certain months (between August 2007 and July 2008) close to 70%. Other monetary aggregates such as broad money (M2), which includes currency, sight deposits and saving accounts, presented growth rates that at their peak (between May 2007 and July 2009) reached annual growth rates between 40% and 50%. Finally, M3, which additionally includes time deposits, grew at annual rates above 30% (Figure 16). Starting from August 2008, however, there was considerable deceleration in the growth of monetary aggregates. At the end of February 2009, the growth rates of currency, M2 and M3 reduced to levels that ranged between 13% and 15%.

Figure 16: Inflation and monetary aggregates, 2003-2008 (% growth rates)



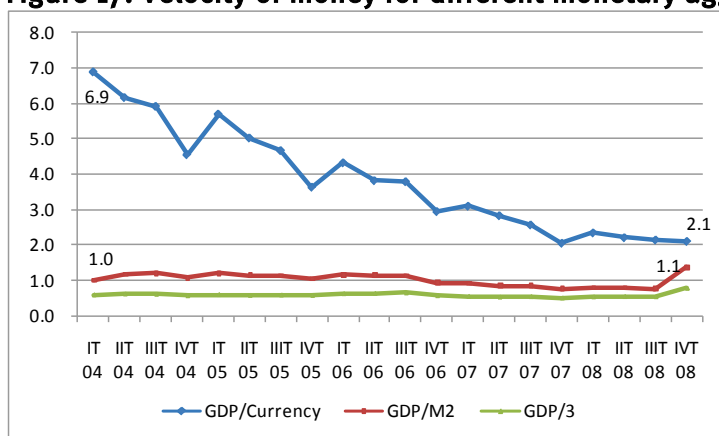
Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_monetario).

The significant increases in monetary aggregates caused inflation to go up, although this stood at relatively much lower rates if compared with the growth rates exhibited by monetary aggregates. At its peak in June 2008, the year-on-year inflation rate was 17.3%. Thereafter, it went down, to 8.1% in February 2009, owing to the effects of decreased domestic income and the large exchange rate appreciation as a result of the currency devaluations of Bolivia's main trading partners (such as Brazil and Argentina) over recent months.

Why such huge increases in monetary aggregates have not produced higher inflation rates has been an issue debated hotly in Bolivia in recent years. A plausible explanation is the fact that the demand for bolivianos (the domestic currency) has increased in past years, as a result of the appreciation of the exchange rate. A key characteristic of the Bolivian economy after the hyperinflation during the first half of the 1980s was the high degree of dollarisation, in terms of both the assets and liabilities of the financial system and price and contract indexations. Because of the recent exchange rate appreciation,

however, the preference of the public for bolivianos increased considerably, causing the velocity of money to reduce significantly. Figure 17 shows that the GDP/currency ratio, which is a measure of the velocity of money, reduced from 6.9 in the first quarter of 2004 to 2.1 in the fourth quarter of 2008. This downward trend halted during 2008, when the ratio remained almost constant throughout the year.

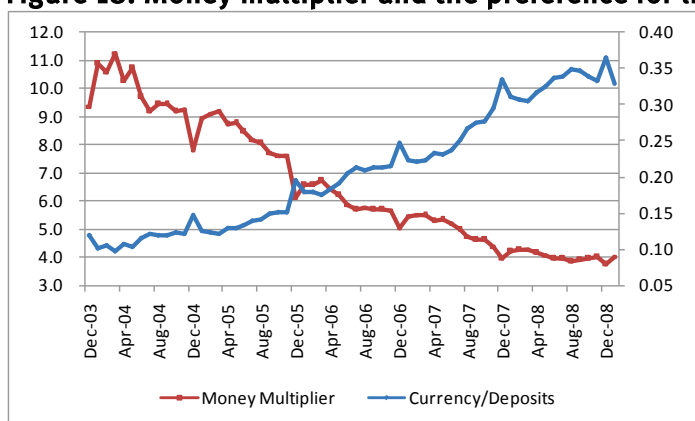
Figure 17: Velocity of money for different monetary aggregates, 2004-2008



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_monetario) and INE (www.ine.gov.bo/indice/visualizador.aspx?ah=PCo1010304.HTM).

Broader monetary aggregates, such as M2 and M3, did not present the same pattern, as the GDP to M2 and GDP to M3 ratios exhibited a more stable pattern. Thus, it seems that it was the demand for currency that increased more proportionally than GDP, whereas other broader monetary aggregates increased but at similar rates to GDP. Thus, people increased their preference for currency vis-à-vis other assets, such as deposits. The liquidity preference ratio (currency/deposits) rose from 0.12 in December 2003 to 0.33 in January 2009 (Figure 18). As a result, the money multiplier reduced from 10.9 in January 2004 to 4.0 in January 2009.

Figure 18: Money multiplier and the preference for liquidity, 2003-2008



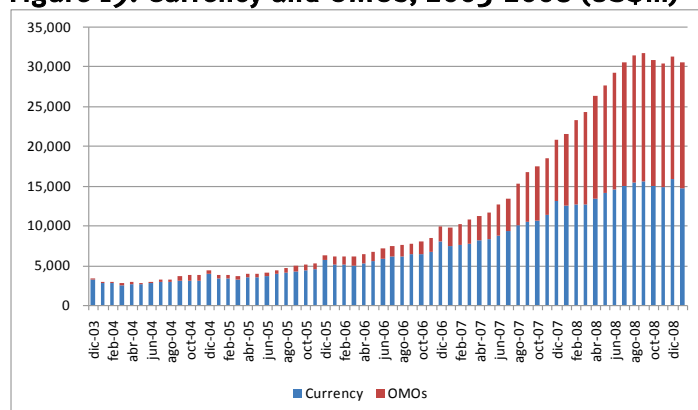
Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_monetario).

Figure 19 shows the impressive increase observed in the stock of currency in circulation, which rose from Bs3.2 billion in December 2003 to 15.5 billion in September 2008, a fivefold increase. In the past four months, however, the stock of currency has decreased by 5.6%, a very small reduction but one which represents a change in the positive trend currency growth exhibited in recent years.

In order to reduce inflationary pressures, the central bank sought to sterilise excess liquidity by issuing Treasury bonds through open market operations (OMOs). The amount of domestic public debt created through OMOs increased from Bs0.2 million in December 2003 to 15.9 billion in August 2008. There was a debate on the effectiveness of this policy in effectively reducing the amount of money in the economy. According to Obstfeld (2001), a country cannot simultaneously maintain fixed exchange rates and an open capital market while pursuing a monetary policy geared toward domestic economic

objectives ('impossible trinity'). Bolivia has an open capital account in the balance of payments and a managed exchange rate, thus money supply should be determined endogenously. The higher interest rates paid by the central bank in order to carry out its OMOs at the same time promoted compensatory capital inflows from abroad (or discouraged capital outflows), largely offsetting the reduction of money supply brought about by OMOs. This policy, however, unambiguously contributed towards maintaining a higher level of exchange reserves.

Figure 19: Currency and OMOs, 2003-2008 (US\$m)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_monetario).

3.4 Effects of shocks in the functioning of the financial system

According to Massa (2009), financial contagion to developing countries can be classified into two categories: i) spillovers through financial market linkages; and ii) pure contagion. The former includes spillovers through stock markets and financial intermediaries, whereas the latter consists in shifts in investors' market sentiment and changes in their perception of risks.

3.4.1 Characteristics of the financial sector

The effects of the crisis on the financial sectors of developing countries are expected to differ from country to country, depending on the specific characteristics of the domestic banking system as well as of capital markets (Massa, 2009). In the Bolivian case, the financial sector is divided into three types of institutions: depository, contractual saving and investments institutions. Depository institutions – banks and non-banks – are the main vehicles for institutional savings and represent 58% of total savings (Table 2). In contrast, contractual savings and investments institutions, despite representing 37% and 5% of total savings, respectively, make most of their investments in depository institutions.

Table 2: Composition of institutional savings in Bolivia (2008)

Type of intermediary	Amount (US\$m) as of June 2008	Share (%)
Depository institutions	6066	58
Bank	4384	42
Non-bank	1682	16
Contractual savings institutions	4423	37
Pension fund	3428	32
Insurance funds	495	5
Investment intermediaries	565	5
Total savings	10,554	100

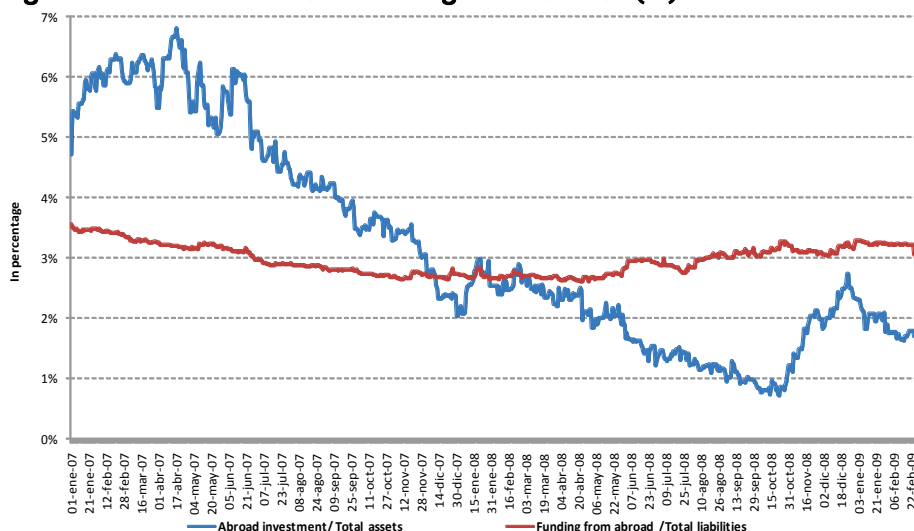
Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_bancario).

The depository institutions are: 12 commercial banks, six private financial funds, eight mutual savings institutions and 28 savings and loan cooperatives. According to the Superintendency of Banks and Financial Entities of Bolivia (SBEF), there are four foreign banks, four banks and four private financial funds with foreign ownership – share varying from 10-99% – and the rest have full domestic ownership.

3.4.2 Financial external exposure

Direct exposure is insignificant owing to low levels of sharing. Investment abroad, as a percent of total assets, has decreased during the global financial crisis, to around 2% in recent months. This characteristic is not a result of current regulations: banks and pension funds allow investments of 10% of assets in foreign financial markets. Rather, high domestic nominal interest rates during this period were an attractive alternative to offshore international instruments, and banking regulations did not help limit exposure to riskier assets. Funding from abroad, as a percent of total liabilities, has been stable, at around 3% (Figure 20).

Figure 20: Investment and funding from abroad (%)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_bancario).

The features of Bolivian financial system show that the main channel through which financial contagion spillovers may spread into the financial sector is represented by the depository institutions; contagion may be caused by increased risk aversion in operating in the domestic currency.

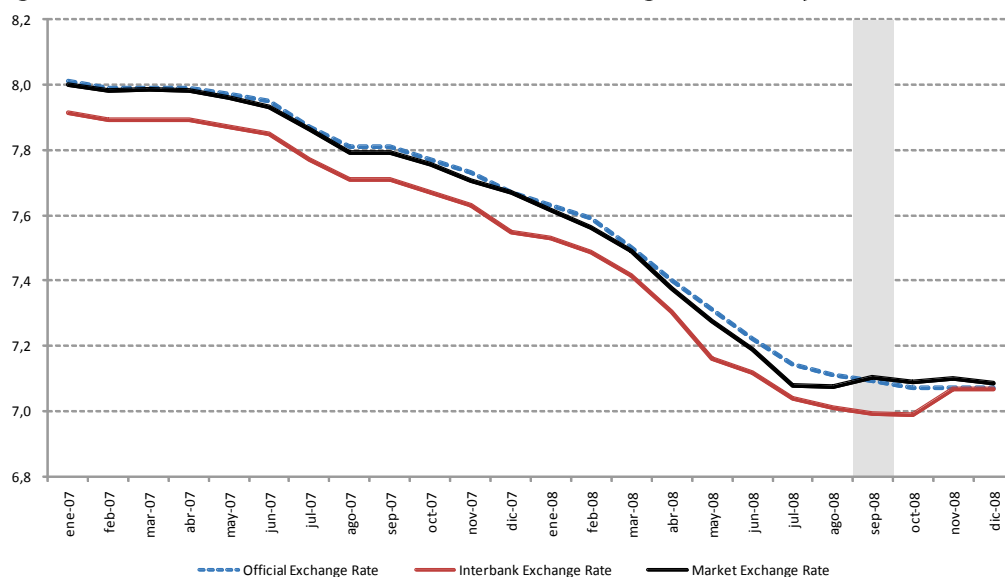
3.4.3 Financial contagion

Massa (2009) mentions that pure contagion does not owe to changes in market fundamentals and may be caused by heightened risk perception and declining investor confidence as well as by increased risk aversion. These phenomena may lead investors to sell off assets in developing countries, which are perceived as more risky than high-quality assets from large mature economies ('flight to quality'), thus causing a sudden reversal of financial flows from developing countries' capital markets.

In September 2008, the US government seized control of Fannie Mae and Freddie Mac, Lehman Brothers Investment Bank declared bankruptcy, government bailouts were announced for key banks in the UK, Benelux countries (Belgium, the Netherlands and Luxembourg) and Germany and there were state takeovers of banks in Iceland and the Benelux countries. Figure 21 shows that risk perception in the domestic currency changed suddenly at this time. Before this date, agents had been making all their majority financial transactions in the domestic currency, because of the appreciation of the boliviano against the dollar. Moreover, the financial sector had been selling foreign currency to the Central Bank of Bolivia, on average US\$165 million per month during January and August 2008.

In contrast, after September 2008, the financial system started to buy foreign currency, US\$195 million per month between October and December 2008. During this period, the market exchange rate was higher than the official exchange rate, meaning that demand for dollars was higher than supply. The central bank increased the supply two times during the last trimester of 2008, from \$5 million in September to \$50 million in December, and the financial sector bought around \$776 million in this period. In general, the change of pattern in the foreign exchange market shows that the main effect of the global financial crisis in Bolivia owed to adjustment of risk aversion in the domestic currency.

Figure 21: Official, inter-bank and market exchange rate, 2007 and 2008 (Bs per US\$)



Source: BCB (http://www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

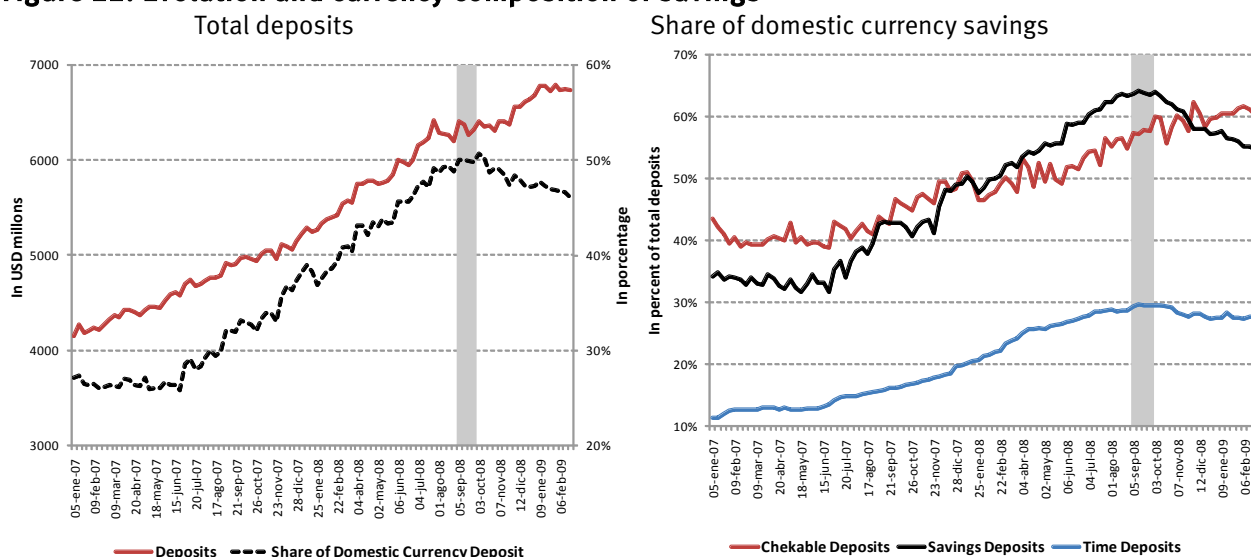
3.4.4 Financial vulnerability

The change in risk aversion had a negative effect on deposits. Before September 2008, deposits had been increasing at around 2% per month; this was only 1% per month after September. Moreover, the share of domestic currency savings dropped constantly, from around 50% in September 2008 to 46% in February 2009.

Analysis of the currency composition of savings shows that the change came mainly from savings deposits: the share of domestic currency dropped from 64% in September 2008 to 55% in February 2009 (see Figure 22). Time deposits did not change considerably: the share dropped only 3% in the same period. These facts show that economic agents responded quickly to the new scenario, changing their portfolio composition to not incur any capital loss from saving in the domestic currency.

The financial sector also has been demanding foreign currency to hedge any exchange rate risk. In recent months, the banking sector has been maintaining an excess on reserve requirements by expanding foreign currency deposits or credits and buying dollars. The excess was around US\$24 million per month during January 2007 to September 2008 and \$117 million per month between October 2008 and February 2009. At the beginning of 2009, the central bank and SBEF changed the reserve requirement and loan loss reserve to incentivise the use of the domestic currency, but this did not have any effect: these policies only increased the intermediation cost in foreign currency.

Figure 22: Evolution and currency composition of savings



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/semanales).

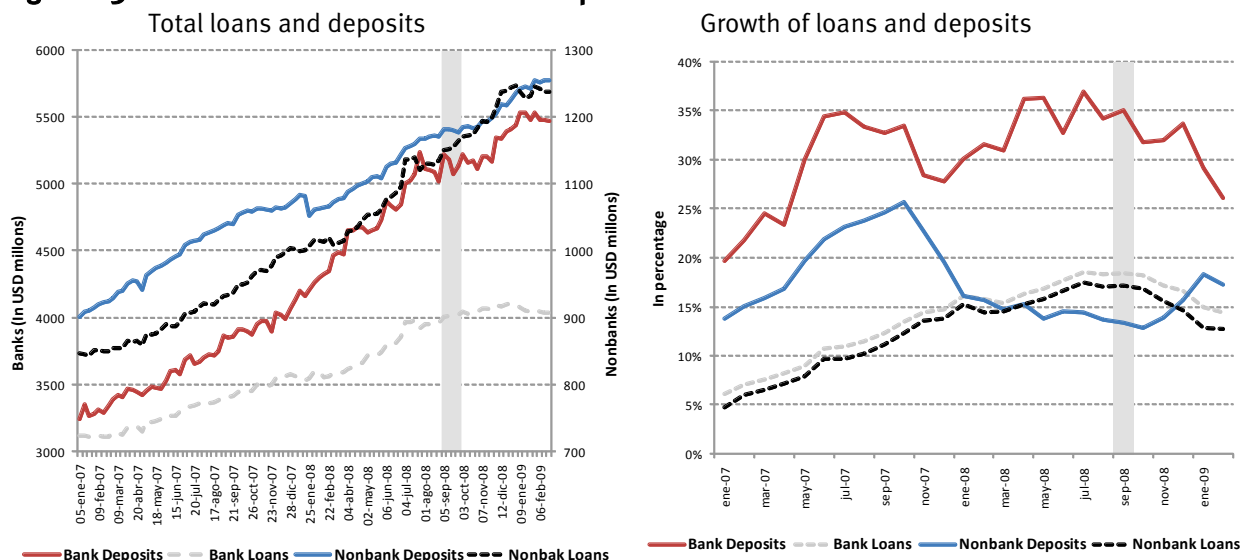
In general, the changing of the currency composition of savings shows that still there is a problem of hysteresis in the Bolivian economy, because agents want to save in foreign currencies instead of the domestic currency.

The financial vulnerability of depository institutions can also be evaluated by the quality of assets: the growth of bank credit to the private sector and the composition of bank lending. Massa (2009) mentions that many developing countries have recently relied significantly on bank lending to the private sector for the development of their economy, but the global deep and protracted downturn that might follow from the financial turmoil may affect the ability of borrowers to repay their debts, thus leading to a rise in non-performing assets and, as a consequence, solvency problems for many banks.

The difference between deposits and credit for commercial banks increased from the beginning of 2007. In contrast, this difference decreased for non-bank institutions in the same period (see Figure 23). Moreover, growth rates of loans and deposits show that non-bank institutions have relied significantly on lending to the private sector; the commercial banks have diversified their portfolio into other assets, such as government bonds. Non-bank institutions have more exposure to solvency problems if the financial turmoil affects the ability of borrowers to repay their debts.

The diversification of commercial banks' portfolios into bought government instruments has occurred for three reasons: an attractive alternative to offshore international instruments; the appreciation of the boliviano against the dollar; and high credit risk in the domestic currency. As of now, total investment in government instruments of depository institutions is at around US\$1164 million. The investment of commercial banks is around \$1152 million, which represents 16% of total assets; in contrast, the investment of non-bank institutions is only \$12 million, about 1% of total assets.

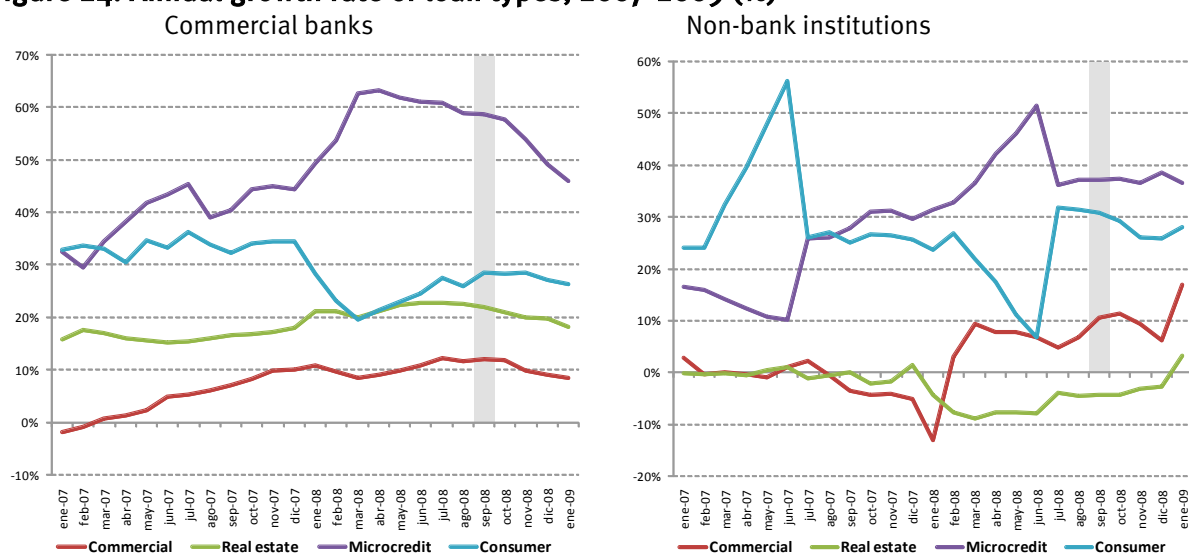
Figure 23: Bank and non-bank loans and deposits



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/semanales).

In relation to composition of lending, the credit of commercial banks is concentrated in commercial (56%) and real estate loans (21%), and of the non-bank institutions in microcredit (55%), real estate (20%) and consumer credits (20%). The different types of credit grew continuously from the beginning of 2007, with annual growth rates at more than 10% in most credit types (see Figure 24). Moreover, microcredit and consumer lending have grown faster than other types of credit, meaning that non-bank institutions and, less so, banks are exposed to the risk of a potential increase in the level of household and small and micro-enterprise indebtedness as a consequence of the current turmoil.

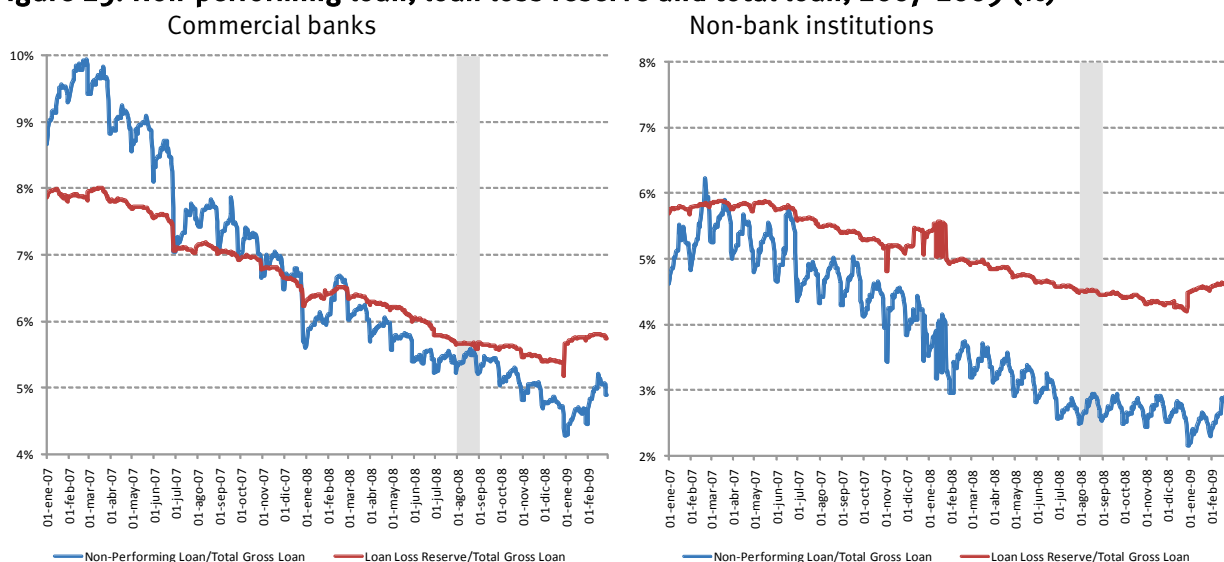
Figure 24: Annual growth rate of loan types, 2007-2009 (%)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/semanales).

Furthermore, annual growth rates show that the commercial banks have been very cautious in the expansion of credit as compared with non-bank institutions: the commercial loans growth rate has been less than 10% and the microcredit loans growth rate has been around 38%.

Figure 25: Non-performing loan, loan loss reserve and total loan, 2007-2009 (%)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/semanales).

The ratio of NPLs to total gross has decreased during the past two years, meaning that the depositary institutions are at less risk of solvency problems (see Figure 25). However, the loan loss reserve as a percentage of total loans did not increase at the same rate as loans: the ratio decreased in the same period, showing that, in the case of any loan problems, the financial system will not have enough resources to protect against a loss, with negative effects on stability and solvency.

This latter feature has two origins. First, the greater flexibility introduced in financial regulations during the years of the financial crisis (1999-2002) gave banks a more flexible schedule to constitute reserves for NPLs. Second, a change introduced to the credit risk categories increased the number of rating categories from five to eight, with different assessment criteria, which ultimately meant a more flexible regime.

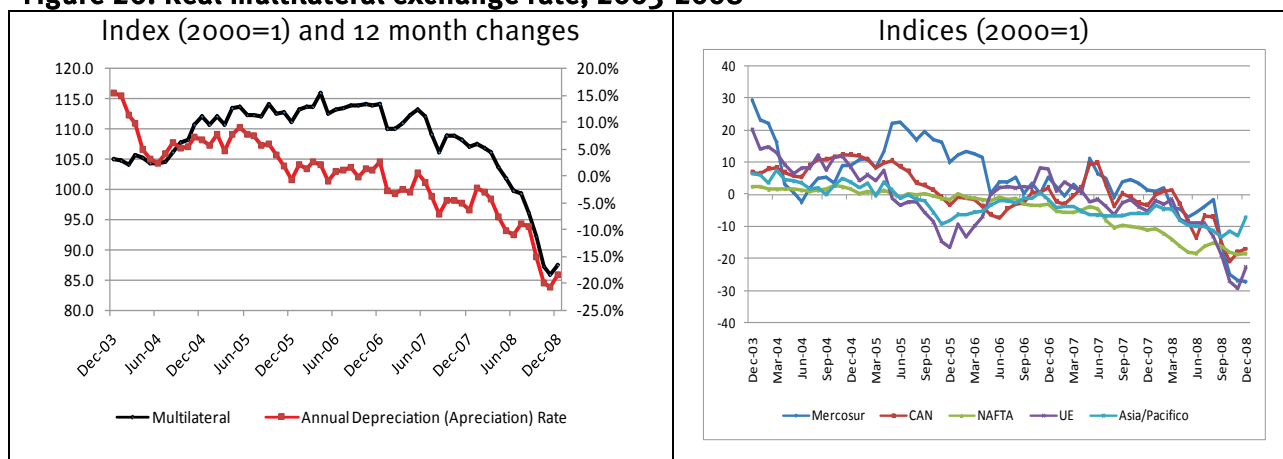
On the other hand, Figure 25 shows that the ratios of NPLs have increased slowly from the beginning of 2009. This is evidence that the global financial crisis is starting to have negative effects on economic activities. Therefore, the SBEF is trying to improve financial regulation to cope with the effects of the financial crisis, by introducing norms that change according to the economic cycle and by supporting the use of the domestic currency. It is clear that these policies have had a positive impact – loan loss reserves increased after the launching of the new regulation.

Finally, annual growth rate and NPL trends show that the global financial crisis began to have an impact on the real sector three months after the crisis started to make waves in Bolivia. Moreover, it is imperative to look for innovative financial policies to improve banks' asset quality and financial soundness.

3.5 Effects of shocks on the real exchange rate

The abundance of foreign resources has generated large pressures for an exchange rate appreciation. The weighted multilateral real exchange rate (MRER) index shows that Bolivia experienced an appreciation of its real exchange rate of 24% between April 2007 and December 2008 (Figure 26), heightened by the large exchange rate devaluations carried out by Bolivia's trading partners over the past 12 months.

Figure 26: Real multilateral exchange rate, 2003-2008



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo).

The real appreciation of the exchange rate occurred with almost all the trading regions of the country: the Common Market of the South (Mercosur) (by 9.1%), the Andean Community (CAN) (22.4%), the North America Free Trade Agreement area (NAFTA) (28.2%), the European Union (EU) (36.3%) and Asia-Pacific countries (23.8%) (Table 3).

Table 3: Real exchange rate depreciation (appreciation) by geographic area, 2000-2008 (%)

	2000-2004	2005-008	Main exported item
Multilateral	17.1	-22.1	
Mercosur	-8.6	-9.1	Hydrocarbons
CAN	31.8	-22.4	Agro-industry
NAFTA	22.8	-28.2	Manufacturing
EU	73.3	-36.3	Mining
Asia-Pacific	20.3	-23.8	Mining
Chile	26.3	-34.3	
Venezuela	-8.8	17.3	Agro-industry

Source: Own calculations based on data published by BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_externo) and INE (www.ine.gov.bo:8082/comex/make_table.jsp?query=comex).

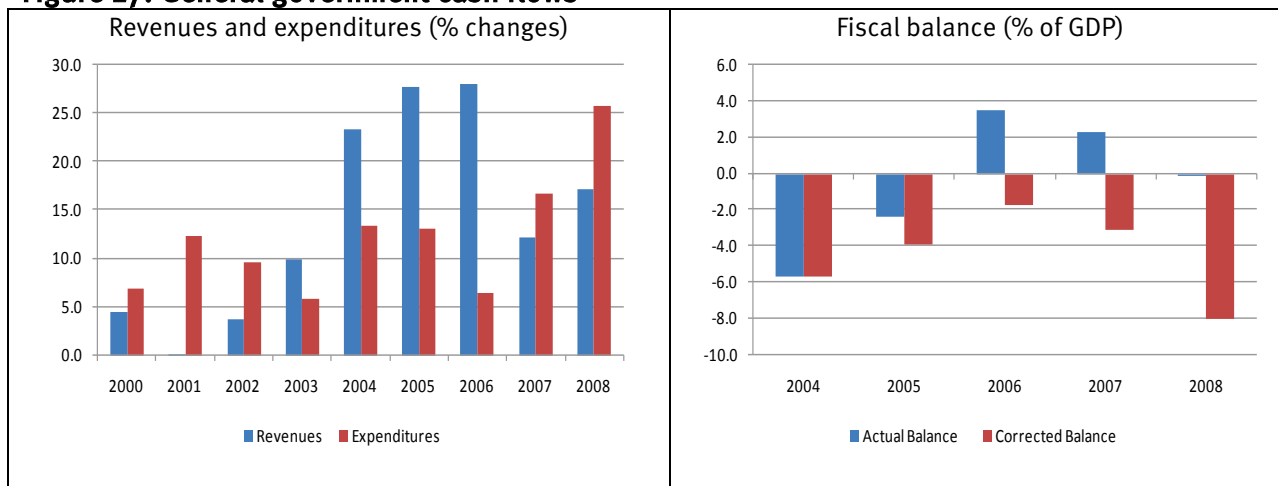
Because of the exchange abundance, the central bank continuously devaluated the nominal exchange rate between June 2008 and October 2008. Since then, it has maintained a fixed exchange rate of Bs7.07 per US dollar. Thus, there are large pressures for a nominal devaluation of the exchange rate. However, the central bank has made a strong commitment to maintaining the fixed exchange rate. The arguments put forward are various: i) the level of exchange reserves will guarantee a stable exchange rate; ii) a devaluation will increase inflationary pressures; iii) devaluation could also increase the rate of NPLs in the financial system, through the balance sheet effect; iv) devaluation could reverse the de-dollarisation of the economy, a process painfully attained by the central bank over the past years. The last seems the most important argument for the central bank, because the moment it begins to devalue the exchange rate, people may lose trust in the boliviano as a reliable reserve of value vis-à-vis the dollar, and will trade their holdings of boliviano-denominated assets (currency, Treasury bonds, bank deposits, etc.) for US dollar notes. This, the central bank fears, will trigger an attack against the boliviano and will produce a sizable reduction in the exchange reserves.

3.6 Effects of shocks on the fiscal balance and debt

The large external incomes the Bolivian economy received between 2004 and 2008 significantly increased government revenues. In 2005 and 2008, total revenues by the general government increased in nominal terms at rates larger than 25% a year. Two factors contributed to these significant increases: first, the creation in 2005 of a new tax on hydrocarbons production, equivalent to 32% of total hydrocarbons output; second, the higher prices of oil on international markets. Expenditure also

presented highly positive growth rates, evidence that the larger fiscal revenues promoted an expansion in expenditures. In 2008, the rate of growth of expenditures by the general government was as high as 25.8%. The significant increase in revenues helped to revert the chronic fiscal deficit the Bolivian economy historically presented. In 2006 and 2007, the general government's balance presented surpluses of 3.5% and 2.3% of GDP, respectively. In 2008, however, the balance moved again to a small deficit of 0.01% of GDP, owing to the large expansion of expenditures carried out in that year. Figure 27 shows that if oil prices had not presented such large increases on the world market, the government balance would have exhibited deficits in 2006 and 2007 and the deficit in 2008 would have been as high as 8.0% of GDP.

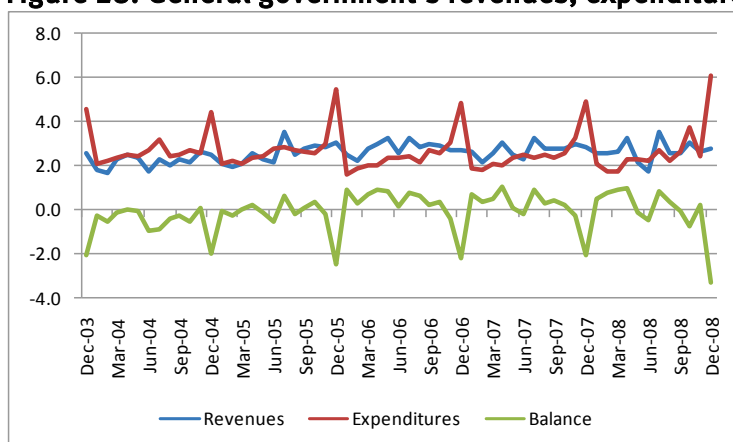
Figure 27: General government cash flows



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_fiscal) and UPF (www.upf.gob.bo/index.htm).

Analysis of fiscal balance behaviour utilising monthly data shows that there has been a relatively stable trend in both revenues and expenditures behaviour over time, both variables measured as a percentage of GDP (Figure 28). There are seasonal increases of government expenditure in December, when the Christmas bonus is paid to public servants. During 2008, this increase was more pronounced and brought about a very sharp increase in the fiscal deficit. The government considerably increased its expenditures in December not only because of the seasonal factor but also because of the national referendum in December to vote for the new Constitution, which the government pushed to be approved. In the future, it is possible that the government will pursue expansive fiscal policies in order to offset the recessionary effects of the international crisis.

Figure 28: General government's revenues, expenditures and balance, 2003-2008 (% of GDP)

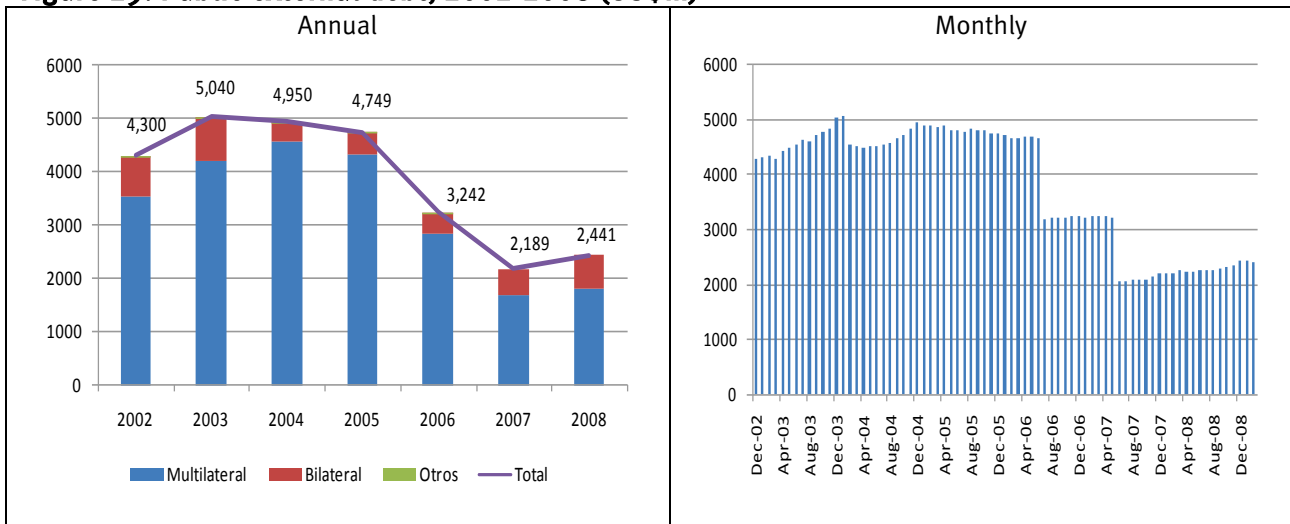


Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_fiscal) and UPF (www.upf.gob.bo/index.htm).

Whether or not the government has the capability to conduct a countercyclical fiscal policy to offset the effects of the global crisis is an issue that needs to be analysed carefully. In the first place, the Bolivian government has expanded expenditures considerably in recent years, and there is no certainty that

these additional expenditures are being spent rationally and efficiently. The public sector does not count on a system to evaluate the quality of public expenditures. A rationalisation of public expenditure to improve its quality, both current and capital, could be more effective than an increase in the amount of expenditures. Second, the government has more room to finance larger expenditures, as its external debt has reduced considerably owing to different debt relief initiatives. Figure 29 shows that, at the end of 2008, Bolivia's external debt amounted to US\$2.4 billion, equivalent to 14.5% of GDP. However, monthly data on the country's public external debt show that, despite the sizable surpluses shown by the fiscal balance, the level of public external indebtedness has kept increasing since the second half of 2007.

Figure 29: Public external debt, 2002-2008 (US\$m)



Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_fiscal) and UPF (www.upf.gob.bo/index.htm).

4. Identification and assessment of likely shocks that will affect the Bolivian economy

Based on the discussion above, it is possible to identify the following effects as likely to arise in the Bolivian economy as a result of the financial crisis:

- Lower export revenues and reduced remittances are likely to reverse the current account and fiscal surpluses attained in recent years.
- The global financial crisis will also reduce export volumes of mining, agro-industry and manufacturing exports, thus causing a deceleration of the economy.
- The government will likely try to offset the recessionary effects of the crisis coming from the external sector by conducting countercyclical fiscal policies, such as increasing government investment.
- Foreign exchange reserves held by the central bank will be exposed to significant pressures, owing to: i) decreased foreign exchange earnings resulting from lower export revenues and reduced remittances; ii) larger government expenditures aimed at offsetting the effects of the crisis; iii) potential utilisation of the exchange reserves to finance government-specific projects; and iv) higher devaluation expectations by the public, leading to a sharp reversal of the de-dollarisation process, which in turn would cause a sharp reduction in foreign exchange reserves.

Table 4: Potential impacts of shocks and policies on key macroeconomic variables

	50% reduction in natural gas export price	50% drop in remittances	10% drop in mining export volumes and 50% in prices	5% increase in public investment real growth rate
GDP growth	0.0	-2.8	-2.0	0.6
Current account balance (% of GDP)	-8.5	0.8	-3.5	-0.4
Fiscal balance (% of GDP)	-5.0	-0.7	-0.5	-0.5
Exchange reserves (US\$m)	-1665.0	77.7	-730.6	-57.5
Unemployment rate	0.0	3.0	1.6	-0.8

Source: Own estimates based on our own macro-consistency model.

Table 4 shows various counterfactual simulation exercises, carried out by means of a macroeconomic consistency model. The simulation exercises analysed are: i) a 50% reduction in natural gas export prices; ii) a 50% drop in remittances; iii) a 10% reduction in mining export volumes and 50% drop in mining export prices; and iv) a 5% increase in the rate of growth of public investment. The results of the simulation are as follows:

- A 50% reduction in natural gas export price is not likely to affect GDP growth and employment, because export volumes are not likely to be reduced. Besides, the hydrocarbon sector has few backward linkages with the rest of the economy. Although this shock will reduce government revenues, the government will prefer to run a deficit and increase its expenditures, in order to avoid recession. This shock, however, is likely to generate large deficits in the current account and fiscal balances, and thus losses in the level of foreign exchange reserves.
- The 50% drop in remittances would have larger impacts on activity and employment as it would cause a direct impact on households' consumption and investment demand. Besides, its impact on the current account and fiscal balances, and on the level of foreign exchange reserves, is likely to be very small.
- A 10% reduction in mining export volumes and 50% drop in mining export prices are also likely to cause losses in output and employment. The impact of these shocks is much larger in terms of the current account balance and foreign exchange reserves, and very low in terms of the fiscal deficit.
- A 5% increase in the rate of growth of public investment is likely to produce some positive results in terms of GDP growth and employment creation. This policy, however, is likely to

increase the fiscal and current account deficits and generate a reduction in the level of foreign exchange reserves.

5. Potential policy responses

Because of the very favourable external economic conditions witnessed between 2005 and 2008, the Bolivian economy is in a better position to undertake countercyclical policies to ameliorate the negative effects of the global financial crisis than in previous times of heavy external shock. For instance, the large external foreign exchange reserves accumulated by the central bank and by the financial system as a whole could serve as a backup for countercyclical expansive fiscal policy aimed at offsetting the recessionary effects resulting from the external sector in the form of reduced exports and remittances. Besides, reserves could also help the central bank maintain an exchange rate policy aimed at guaranteeing stability and competitiveness.

The rest of this section analyses in more detail potential policies that could help offset the negative effects of the global financial crisis and the different trade-offs each of these policies could entail for the economy.

5.1 Fiscal policy

The 2009 national budget comprises a 20.6% increase in public investment and a 12% rise in public servants' wages and salaries. Besides, the government has also hinted that it could resort to central bank reserves in order to finance specific projects, executed by public enterprises or by the state development bank. As outlined above, an expansive fiscal policy could help offset the negative effects of the global crisis. However, public expenses have also increased considerably in the past four years, as the extremely favourable external economic conditions for the country significantly increased public revenues. Although the government could have some room to further expand expenditures in coming years, it is necessary to do more in terms of improving the efficiency and effectiveness of public expenditure.

5.2 Exchange rate policy

The central bank has stressed that it will maintain a fixed exchange rate, arguing that this policy will help attain several policy objectives: i) a fixed exchange rate would reduce inflationary pressures; ii) it would avoid the negative effects that devaluation tend to have on a dollarized financial system through the balance sheet effect. Although devaluation does not affect directly banks' balance sheets, because banks do not have a currency mismatch between assets and liabilities, it tends to have a very negative impact on the balance sheets of firms that borrow from banks. Firms normally owe to banks debts that are stated in foreign currency terms, while their assets and incomes tend to be stated in the domestic currency. Thus, a devaluation would increase the value of firms' liabilities, while the value of their assets would remain unchanged, thus causing significant wealth and income losses for them. This would deteriorate firms' cash flows, increasing the rate of unperforming banks' loans; iii) a devaluation would revert the de-dollarisation of the financial system, a policy long pursued by the central bank. If agents perceive that the dollar is again the best alternative currency as a store of value, they will trade their bolivianos for dollars, causing a sharp reduction in reserves.

On the other hand, the arguments in favour of a more flexible exchange rate policy are: i) it would avoid exchange rate appreciation. The country already experienced a 20% real exchange rate appreciation during 2008, causing a loss of competitiveness to its tradable sector. Thus, devaluation would promote exports, reduce imports and encourage economic activity; ii) if the central bank adopts a crawling-peg exchange rate policy, such as that implemented in 1985, the effects of small rates of devaluation on prices, on banks' balance sheets and on the dollarisation of the economy would be small; iii) Bolivia has had very bad experiences in the past with pegging its exchange rate, because the exchange rate has tended to develop a substantial lag, with a sizable devaluation eventually needed to correct this.

There is one more fundamental issue in the management of the exchange rate policy, related to the institutional factor. Whether the central bank adopts a fixed or flexible exchange rate system will depend on the trade-offs outlined above and on the policy priorities of the central bank, which will be included in the bank's loss function. Whether the central bank succeeds in its policy of maintaining a fixed exchange rate will depend on institutional factors, namely, central bank autonomy or independence. If autonomy is not preserved, the commitment made by the central bank to maintain a fixed exchange rate will not be credible, and an exchange rate devaluation will occur sooner or later.

5.3 Monetary policy

However, it must be noted that the central bank and the financial system as a whole have accumulated claims against these foreign reserves, in the form of currency, deposits, public bonds, etc. Table 5 shows that, in September 2008, net reserves held by the central bank amounted to US\$7.7 billion. At the same time, the central bank's liabilities comprised \$2.2 billion in currency held by the public; \$1.9 billion in net liabilities with the public sector; and \$2.5 billion in net liabilities with the rest of the financial system, including \$2.8 billion in public bonds sold to financial entities through open market operations.

Table 5: Foreign exchange reserves and central bank liabilities, 2004-2008 (US\$m)

	Dec 2004	Dec 2005	Dec 2006	Dec 2007	Dec 2008
Net foreign exchange reserves	1121	1697	3139	5250	7701
Gross reserves	1269	1781	3154	5249	7699
Short-term foreign liabilities	148	83	15	-1	-1
Total net liabilities	1121	1697	3139	5250	7701
Currency	531	765	1093	1839	2351
Net liabilities with the public sector	-236	-85	765	1051	1967
Central government	-478	-519	-41	136	221
Social security	37	38	55	87	155
Local and regional governments	188	383	589	744	941
Public enterprises	17	13	162	84	650
Net liabilities with the financial sector	-20	42	294	1150	2553
Bank deposits and OMOs	251	299	545	1426	2795
Lending to the financial sector	271	256	251	276	242
Other accounts net	-218	-216	-389	-383	-391
Capitals and reservers	1063	1191	1376	1593	1220

Source: BCB (www.bcb.gov.bo/index.php?q=estadisticas/sector_bancario).

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