Dutch disease and the labor market in Bolivia

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Abstract

In the last 10 years, Latin America and especially Bolivia has experienced a period of unprecedented boom induced by substantial revenues on the external front, due to the rise in the prices of exports, remittances and capital flows. This paper argues that Bolivia went through Dutch disease between 2003 and 2014 with an etiology somewhat different to the classic one, and studies its link to the labor market. In the middle of 2014 began a slow decline in the price of minerals and, in 2015, the oil price collapsed violently, interrupting the course of Dutch disease and inaugurating a new period of crisis. This paper explains the underlying mechanisms in both stages and an econometric model is presented to lend consistency to the explanations.

Key words: Dutch Disease, Balance of Payments, Economic Growth, Labor Market.

JEL code: E2, E3, E4, F4

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Introduction

This paper aims to explain how the boom in commodities in the period 2003-2014 provoked the onset of Dutch disease in Bolivia and it tries to identify its impact on the labor market. In its second part, it refers to the sharp fall in the prices of raw materials, interrupting the course of Dutch disease and tipping Bolivia into a new crisis. This study is accompanied by an econometric model of consistency.

Trade boom and Dutch disease

Between the years 2003 and 2014, Latin America exhibited very good economic indicators as it never had in the past. The economies of all of its countries grew, countries reduced their external debt, the balance of payments displayed favorable behavior by the increase in the value of exports and by capital inflows, public deficits were low, inflation rates were moderate, unemployment was reduced and real wages tended to grow. These results are explained by the favorable behavior of commodity prices driven by Asian countries, remittances, capital inflows that fled from the European and American crisis and by the good management of regional macroeconomics.

Vulnerability to Dutch disease in Latin America initiated with the arrival of extraordinary income in the Current Account of Balance of Payments (by the increases of exports and remittances) and in the capital account. The increase of exports dominated this process, accompanied by a remarkable improvement in the terms of Exchange. Coincidentally, remittances increased as a result of strong waves of immigrants towards Europe, encouraged by the difference in wages. The largest recipient of capital flows was Brazil, since it elected to maintain high interest rates in the context of a fixed nominal exchange rate. This policy appealed to the interests of foreign investors who faced low interest rates in their countries. Bolivia did not receive significant amounts in the capital account of the balance of payments, but the government signed new foreign debt contracts and even had a surplus in the current account.

Latin America displayed good administration of public budgets, debt, balance of payments and monetary variables, which is noteworthy, taking into account the fact that

some European countries, Spain, Portugal, Greece and others, had difficulties in doing likewise. However, the extra income was not always invested in projects to promote growth.

Simultaneous to the economic boom, local currencies appreciated against the hard currencies, manufacturing production declined, prices and wages in non-tradable sectors went up compared to their peers in the tradable sector, the primary sector shifted to other sectors and imports replaced part of the national production. In short, the boom was undermining the productive systems in Latin America. This phenomenon is well known as Dutch disease, but did not raise greater concern as governments did not want to affect the delights of bonanza in order to worry about the resulting hangover.

With the economic growth, unemployment decreased leading to poverty alleviation.

Although Dutch disease is a well-known and diffused concept, most countries exhibited difficulties of recognizing it because its etiology is diverse, giving rise to different interpretations. The following section aims to clarify this point.

Bolivia was benefiting from high prices of hydrocarbons, minerals and some agricultural products. It displayed high growth rates together with the favorable evolution of most macroeconomic variables, such as the fiscal balance, international reserves, inflation rates, etc. However, all this was in the context of a high vulnerability to Dutch disease. Policy stakeholders did not expect commodity prices to collapse so soon.

The Dutch disease in few words

In the 1960s, after the discovery of an important gas field in the North Sea, Holland's income strongly increased, accompanied by large inflows of foreign currency. This led to: 1) the real appreciation of the exchange rate, 2) the decrease of non-oil exports, 3) pressure on the prices of non-tradable goods and 4) the displacement of the production factors (capital and labor) towards the sector of hydrocarbons and the non-tradable sector. The trade boom provoked the deterioration of the production and export of other tradable goods and the rising of non-tradable good prices. This process is known by the name of Dutch disease. The above characterization of Dutch disease is exhaustive; however, it can have different etiologies.

Economists of the Bolivian Central Bank (2011 Cerezo, Cerezo and Salazar 2011, Cerutti and Mansilla 2008, Colque 2012, De Souza and Cerezo 2010) stated that Bolivia did not suffer from Dutch disease. They sustained their thinking on the characterization of Dutch disease by Oomes and Kalcheva (2007). The President of the Central Bank shared their point of view. They said that Bolivia did not exhibit the main Dutch disease features, such as: a) currency appreciation, b) slow growth in the manufacturing sector, c) rapid growth of service sector and d) higher wages in the non-tradable sectors. However, the available data do not support their reasoning. On the other hand, there are manifestations of this disease with different symptoms.

The data does, however, support the hypothesis that the evolution of the Bolivian economy in the period 2002-2014, especially from the year 2006, reflects the main symptoms of Dutch disease. In a context of:

- The value of some export goods (gas, minerals, soy) increased rapidly.
- The prices of imported goods grew more slowly than the prices of the goods produced locally.

We observe that:

a) The prices of the non-tradable goods increased more quickly than the prices of the tradable goods.
b) There was real appreciation of the national currency.
c) The Terms of Trade recorded a favorable evolution.
d) The Disposable National Income increased.
e) The net international reserves and the supplies of international currencies grew.

Two characteristics of Bolivia's economy worsened the effects of Dutch disease. The first refers to the difficulty of increasing investment due to constraints of a structural nature (lack of skilled labor, weak institutions, weak managerial capacity, etc.). The second relates to oligopoly in the banking system and to the underdevelopment of alternative financial instruments to banks.

In this context, other Dutch disease manifestations were:

a) Increased and greater diversification of imports.

b) A savings-investment gap.
c) Monetary assets' restructuring.
d) Decreasing interest rates.

In relation to the labor market, this period was characterized by:

a) A decrease of the unemployment rate.
b) A greater decrease in unemployment among unskilled workers than among skilled workers.
c) Absence of a decreasing trend in the informal labor rate.
    e) Relocation of workers from agriculture to construction (non-tradable sector) and to artisanal mining (exports).
    f) Greater concentration of employment according to the classification of the GDP by economic activity.
    g) Greater increase in real wages in the non-tradable sector.

During this period, in the fiscal and monetary field, we observe that:

a) Government income and expenditures expanded rapidly.
b) Government investment and employment grew.
c) Government budgets' balances were positive.
d) Despite the boom and the increase of savings, private investments did not improve.
e) The construction industry benefited the most from private spending.
f) The savings' interest rate remained close to zero.
g) People restructured their monetary assets in looking for liquid assets.

The most serious consequence of this process was the decline of the participation of the GDP in the global supply as a result of the import growth. However, this gave rise to new job opportunities in the informal trade sector for less skilled workers.

Dutch disease dynamics

Since 1986, Bolivia has had a regime of open foreign trade, without prohibitions or exception clauses and with moderate tariffs. This, added to the particularities of its development, makes the production structure very sensitive to import and export prices. We have calculated the entropy of the distribution of GDP in 11 economic activities and estimated a linear regression model with the prices of imports and exports as exogenous variables. The results of this estimation show a reasonable association between these variables. Therefore, it is not surprising that the significant increase in the price of exports has had a major impact on production, employment and other macroeconomic variables.

The export upsurge induced the increase of disposable national income and the domestic supply of international currency. Greater revenues gave the opportunity to increase public investment and current spending. The increase of the government's expenditure and its indirect effects on private activity achieved good rates of economic growth and the reduction of unemployment.

The increase in the domestic supply of currency was one of the causes of the real appreciation of the local currency. The increase in income and the real appreciation of money generated incentives to widening the volume and variety of imports.

A proportion of export value induced the international reserves' growth and also the expansion of the Central Bank's money supply (Base Monetaria). This generated the money supply's increase, causing the interest rate to drop. The nominal deposit interest rate went very close to zero. In order to curb inflation via money expansion, the Central Bank opted to diminish the nominal price of the foreign currency in 2008 and, later, by keeping it fixed, looking to increase imports in order to widen the supply of goods and to diminish the quantity of money in the economy. This policy intensified the appreciation of the local currency. This was done in the context of the diminution of the international prices of imported manufactures.

The increase of consumer goods' imports opened new employment opportunities in the sector of retail, especially in the informal sector.

The decrease of interest rates induced a greater preference for liquid monetary assets and for non-monetary assets. On the other hand, the appreciation of the currency spurred a greater preference for assets stipulated in the local currency. Among the most popular non-monetary assets was real estate, giving rise to the boom of this sector, to the creation of jobs and to unemployment's diminution.

At this stage of the process, the two peculiarities of the Bolivian economy mentioned above came into play. The lack of investment opportunities caused the new income to be oriented towards consumption, to the construction sector and to hoarding. Despite savings' growth, private investment in other sectors such as construction remained moderate. The lending interest rate decreased but not at the pace of the deposit rate because of the existing banking oligopoly; it stood at an average of 10 percent per annum in a context where the inflation rate was around 5 percent. The high level of the real interest rate contributed to the discouragement of investment. In consequence, a significant gap between deposits and the bank's portfolio was created.

As happened in other Latin American countries with similar problems, people sought refuge for their income in real estate, inducing an increase of investments in construction, an increase in prices and rents, a rise in labor demand and a rise in wages in the construction sector. This resulted in the displacement of labor in the traditional agriculture sector to the construction sector, and a higher concentration of lending to this sector. The increase of export minerals' prices caused some fields that had been abandoned in the past to become profitable, even when worked by hand. This, and the construction boom and the expansion of retail, allowed the drastic reduction in the unemployment rate. Many new jobs were created in the informal sector.

The troubling result of this process was the increased participation of imports in the structure of the global supply at the expense of domestic production.

An understudied aspect of the revenue boom is the induced lower requirement in the selection of investment projects by the public sector, and the use of revenue windfalls in the search for, or consolidation of, political support. The private sector, in turn, sought to expand their consumption basket with the purchase of imported goods whose

previous incidence was small or zero. Then, a significant part of the resources of the boom was not aimed at securing a foundation for economic growth.

The following sections aim to expand and document the above-mentioned scheme.

Stylized facts

Money appreciation

Money appreciation occurs when the currency supply exceeds demand. This can occur in very different contexts; for example, Devarajan (1997) observes that lending external assistance to developing countries can cause this phenomenon. Recently, in Brazil, currency appreciation originated in the capital flows. In some countries, the remittances originated it, but the more general case is when there is a boom in exports accompanied by a smaller import expansion. This is the situation that has taken place in Bolivia from the early years of the 21st century, and which is worthwhile describing in some detail.

A starting point for detecting Dutch disease is the estimation of the real exchange rate (TCR) defined in the following manner: RER = $E_{t=0}P_{ut}/P_{bt}$, where $E_{t=0}$ is the nominal exchange rate at time t=0, P_{ut} is the local price index and P_{ht} is a foreign price index.

The Central Bank data show a sustained process of local currency appreciating from 2006 to 2014. The trade boom involved the national income increasing without quantitative or qualitative changes in production, producing imbalances between supply and demand which, in turn, led to the modification of internal and external prices, exchange rate appreciation and import expansion. As a manifestation of Dutch disease, the price of consumer goods produced locally grew faster than the price of the imported goods and the consumer price of non-tradable goods grew faster than the price of tradable goods.

Volume and price of exports

Between 2000 and 2014, the general index of export prices climbed to 162.9 percent, that of minerals to 142.31 percent, hydrocarbons to 194.55 percent and the non-traditional to 264.77% percent.

The value of exports between 2000 and 2014 rose 8.8 times, with a rate of annual average growth of 18.33 percent. This is the main source of the increase in the supply of foreign currency, but it is not the only one. Other items in the balance of payments, such as net unilateral transfers, external debt and direct foreign investments also had significant growth. One of the problems attributed to Dutch disease is that it increases the vulnerability of the country, making it more dependent on the external market and accentuating the concentration of exports into a few products. Exports increased their participation in the structure of global demand at the expense of, mainly, domestic consumption. On the other hand, as another symptom of Dutch disease, the structure of exports tended to favor products with greater prices, generating higher levels of concentration. This can be shown through the calculation of the entropy of the export structure.

The impact of the increase in export prices on incomes can be estimated by calculating the difference between exports at current prices and at constant prices, and dividing this difference by nominal GDP. This exercise shows that the increase in the prices of exports on the nominal GDP reached 40 percent in the year 2012.

The prices and quantities of imports also showed a growth trend; however, the export price grew faster than the import price. This induced a favorable evolution of the terms of exchange.

Imports' expansion

The expected effect of the income increase on the price of non-tradable goods was slowed by the massive growth of imports financed by the abundance of foreign currencies, sustained by the government's policy and enhanced by the lower import price of Chinese manufactures.

Imports grew, following the same trend as exports, but not at the same rate. The Central Bank eased the imports' increase, seeking to lessen the possible upsurge in domestic prices induced by the money supply's growth. In this context, the Central Bank reduced the nominal price of the foreign currency by 15 percent in 2008, after which it adopted a nominally fixed exchange regime.

Defining the relative price of imports as the ratio of its price to the GDP deflator, since 2006, the relative price decreased and the volume of imports increased rapidly.

The participation of imports by place of origin shows the growing importance of Asia, particularly China, to the detriment of imports originating in Latin America and in developed countries. This is a result of the Chinese offering lower prices than the other bidders, and also of the Chinese credit supply.

Imports have diversified by the incorporation of new goods (e.g., cell phones, iPhones, etc.), goods that are always imported in small quantities (e.g., automobiles) and goods that in the past were produced only locally (e.g., foodstuffs). Imports in volume grew in all of its products according to the classification of imports for economic destination. Between 2006 and 2013, imports of capital goods grew by 110 percent, raw materials and intermediate products by 146 percent and consumer goods by 186 percent. Among capital goods, those for agriculture grew by 371 percent, capital goods destined for industry and transport grew by only a small amount, except in the year 2013. Imports of intermediate goods for agriculture grew by 1000 percent, those for construction and transportation by 100 percent. Those for industry grew by very little. The significant increase in the imports of capital goods and intermediates for agriculture contrasts with the weak performance of the sector, since its rate of growth in the boom period (2006-2014) was only 2.5 percent.

Imports of non-durable consumer goods grew at a rate of 9.2 percent, generating new retail job opportunities, especially for informal workers.

As clear manifestations of Dutch disease, the price index of consumer goods produced locally shows a more accelerated evolution than the price index of imported consumer

goods. In addition, the price index of non-tradable consumer goods grew faster than the price index of tradable consumer goods.

The Balance of Payment Current Account and the currency supply

In the past, due to the weight of the external debt service and trade deficit, the current account showed negatives balances that were to be financed by the capital account, given that international reserves were scarce. This situation changed strongly from 2006 for three reasons. The first relates to exports' value increasing. The second has to do with the debt forgiveness that Bolivia won from 2003, which resulted in a drastic reduction in the amount of interest paid. The third is associated with the increase in remittances. The trade balance (including non-factor services) went from an average of -2.4 percent of the GDP in the years 2000 to 2005, to a positive average of 4.6 percent in the years 2006 to 2014. Payment of interest on the external debt changed from -1.1 percent of GDP to 0.1 percent between the two periods. The category of "Other investment income" involved an increase of payments to abroad from 2.5 to 4.8 percent of GDP as a result, primarily, of the transfers made by foreign companies working in the field of hydrocarbons and mining. The Current Account during the boom had an average of 6.1 percent of GDP.

Despite having positive balances in the Current Account of the Balance of Payments, Bolivia incurred new external debts that resulted in positive balances in the Capital Account. Both account balances induced a significant increase in international reserves. The Net International Reserves (RIN) grew rapidly, generating a foreign currency supply higher than demand. From an amount that was 157.1 million dollars in the year 1990, it had risen to 1337.3 million dollars by the year 2000 and, in the year 2012, it reached 13,661.1 million dollars.

Private savings' growth and the savings-investment gap

Higher savings in relation to investment is one of the features of Dutch disease. Throughout the history of Bolivia, investments have remained at a level between low

and moderate at 15 percent of GDP and, before 2005, it was necessary for foreign savings to compensate for the low level of domestic savings in order to maintain investment. At that time, it was common to think that investment did not grow by a restriction of access to capital. However, since 2005, domestic savings exceeded investment. Private investments hardly grew at all in relation to their levels of yesteryear, suggesting that there are restrictions of a structural character. These should be related to the weak availability of skilled labor, problems related to social organization (governance and social conflicts), the weaknesses of institutions, the low absorption of technology, environmental problems affecting agriculture and the weak development of the production infrastructure. R. Morales (2012a) provides a more extensive explanation in this regard.

National savings went from an annual average of 11.6 percent of GDP in the five-year period 1990-1994 to 22.11 percent in the five-year period 2010-2014, and private savings went from 7.85 percent of GDP to 11 percent, without causing a significant increase in investment. The public sector, in turn, improved its level of investment and reversed its budget from a deficit to a surplus. In the five-year period 2005-2009, it had an average annual deficit of 1.5 percent of GDP and, in the five year period 2010-2014, it amounted to 0.31 percent of GDP.

Monetary variables: deposits' growth and the interest rate

The significant increase of income and foreign currency supply, the saving-investment gap and the accumulation of international reserves resulted in the growth of the local money supply. The public turned their preference from deposits made in a foreign currency to deposits in the national currency. Three factors converged to discourage foreign currency tenure (as a reserve of value or for domestic transactions): the appreciation of the local currency, the increase in the legal deposit reserve requirements in a foreign currency and the Central Bank's regulations forcing the financial institutions to maintain a gap of 10 percent between foreign currency purchases and the sales price. Assets in foreign currencies had an impact on the foreign exchange market through demand and supply; its reduction contributed to maintaining as fixed the

nominal exchange rate. The second aspect of the monetary assets' restructuring refers to the increase in the preference for liquid assets as a consequence of the decrease of the interest rate. The saving-investment gap led to the growth of bank deposits well above demand for credit, causing the interest rate to drop.

The greater preference for liquid monetary assets (notes and coins) caused the M1 money supply to grow more rapidly than that of the M3, and the deposits/M3 ratio tended to decrease. Given the accelerated growth of the money supply, as well as its restructuring with more liquid assets, it might have been expected that inflation rates would be higher than those actually observed. This did not take place, since neither consumer demand nor investment growth kept the same pace as income, leaving important portions of it unused.

The interest rate dropped, to rank among the 10 percent for investment and 18 percent for consumption, remaining at relatively high levels of 5 to 13 percent in real terms. The lack of a correspondence between the decrease of the lending interest rate and the deposit interest rate can be explained by the weak development of the Bolivian financial market and the banks' oligopoly. The banks concentrated credit to the commercial sector, real estate, construction and transport. These four sectors had, in the year 2014, 70 percent of the credit. The credit advanced to the commercial sector was closely linked to imports, while real estate's and construction's credits responded to the expansion of these sectors. The transportation credit was aimed at imports of automotive parts and equipment.

The new monetary context generated a high vulnerability to price stability and to the external balance. It was a boom that created the seeds of its own destruction.

The boom, Dutch disease and the labor market

The most remarkable result in labor matters was the drastic reduction of unemployment. A level of 12.7 percent in the year 2005 was downgraded to 3 percent at the end of 2015. Traditionally, unemployment affects more women, whose rate in 2005 of 17.5 percent was subsequently lowered to 5 percent.

The important fall in unemployment resulted from economic growth, but the employment policy played a role, as well as the new employment opportunities generated by the boom in imports, especially in retail activities in the informal sector. Employment in the public sector recorded a strong growth. The employment index in the Central Administration grew by about 150 percent between 2005 and 2014. This policy expanded formal employment; it was financed by the increase of export's income. In the formal private sector, the average employment growth was lower, but there were some exceptions. One of them was the financial sector, which grew by around 250 percent. The other sectors with great expansions of formal employment were meat processing, local trade, beverages and bakery. These activities produce non-traded goods and services.

In the developing countries, the informal employment sector has special features; some of them are temporal while others are associated with the economic and social structure. In particular, the relationship between informality and unemployment is U-shaped: it can be high when unemployment is low, or low when it is high. This is explained in the following way: if unemployment is high, many workers seek refuge in the informal sector, in line with the main labor theories. However, if new job opportunities are given to non-skilled workers as a result of economic growth or if there is an increase in the imports of consumer goods that can be marketed, unemployed workers find jobs in the informal sector, especially. On the other hand, attracted by the expectation of better gains, some formal workers would also like to enter into the informal sector. In this way, during the boom, the informal sector did not record a downward trend as could be expected according to the mainstream labor theory.

Structural aspects that make the informal sector show resilience can be identified by the mean of the estimation of probability models. These models show that among the determinants of labor informality are: idiosyncratic features such as age, sex, and schooling differentiated by sex and labor experience, as well as the involvement of fathers and mothers in the informal sector. Situation variables include GDP growth with a negative incidence in the informal labor rate, the share of imports in GDP and the average increase of the population's income with a positive impact. This last factor is

explained in terms of variations in income, which are among the main determinants of the demand for consumer goods. Consistent with Dutch disease, the structure of the employment activities exhibited more concentration, especially from the migration from agricultural employment to trade, construction and transportation. In all of these activities, there are many informal workers.

The wages policy during the boom was one of the instruments with a greater impact on the redistribution of income and the reduction of poverty. Each year, the government established new minimum wages and new scales for compulsory wages' increases for all sectors. In general, wage increases were higher than inflation, which led to improving real wages. The basic idea was to redistribute part of the benefits of the boom in the form of wages. The government compelled employers to give two additional salaries at the end of the year if the GDP growth rate exceeded 4.5 percent. Wages in the public sector are subject to the maximum limit imposed by law, and serve as guide or reference point for wages in the private sector. Although the control of the compliance of these norms in the private sector is not strict, there is a strong correlation between wage averages in the public and private sectors. That suggests that both sectors recorded increases in their real wages. The increase in earnings of the formal workers induced the consumer demand growth, especially consumer goods marketed by the informal retail sector, raising their income.

Damage caused by Dutch disease

The production of non-tradable goods and services

One of the characteristics of Dutch disease is the rise in prices of non-tradable goods. This observation faces the problem of classifying goods as tradable and non-tradable, because this classification may undergo changes over time; for example, as the internal and external price gap decreases, the range of goods and services that are non-tradable can become tradable (for example, fresh milk, bakery products fresh vegetables, tubers, etc.). Therefore, based on the distinction between tradable and non-tradable goods, it is

difficult to estimate the effects of Dutch disease in wages and prices. In Bolivia, wages in the services are subject to the maximum limit imposed by law for public servants, which serves as a guide or reference point for wages in the private sector. In any case, it is possible to find some non-tradable sectors, for example building, where Dutch disease has a particular impact in line with the well-known symptoms of this syndrome.

Prices in the construction sector and resource displacement

Part of the significant increase of income was invested in construction, causing a boom in this sector with the rise of land prices, housing rents and wages. The nominal wages of the construction workers had a monthly growth of 13.62 percent annually, well above the rate of inflation and the increase of wages in other sectors. An impressive increase in the rental of dwellings between the years 2008 and 2012 was achieved; in Potosi, mining attracted many people, driving up the price rental dwellings by 145.8 percent. The building boom largely responded to the desire of the public to find assets in which to place their savings, in a context of scarce alternatives to bank deposits. Building investments became an instrument of the value conservation of savings, becoming one of the features of Dutch disease. The construction demand captivated a significant part of the bank credit and led to the displacement of the agricultural workforce to the construction sector. A trade-off between non-industrial agricultural production and the expansion of the construction sector was observed.

This issue involves many risks. On the one hand, the real estate boom should face the saturation of demand for housing, which could generate a fall in prices and risking a mortgage crisis. However, some economists stated that there could not be a saturation of demand, to the extent that many people buy land and houses only as a way to place their savings without the intention of inhabiting them. In this case, the economy faces another risk, perhaps greater than the previous one. Given that real estate assets are not liquid actives, any financial turmoil could lead to a foreclosure crisis likely to act as a drag on the banking system.

On the other hand, the displacement of non-industrial agricultural labor induced the increase in food imports to cope with the decrease of domestic production. Returning to the previous situation would be difficult.

GDP decreases its participation in the global supply

One of the most important and troubling features of Dutch disease is the GDP's displacement by imports in the global supply, impelling the Bolivian economy to enter a situation of great vulnerability. During the boom, Bolivia exhibited a persistent fall in the participation of the national production in the global supply, with the exception of the years 2009 and 2010.

Since 1990, the Bolivian economy has registered positive, although modest, growth rates of between 3 and 5 percent. With the trade boom, Bolivia expected to grow more quickly, taking into account the large amount of resources available for investment. If all the savings had been invested in the five-year period of 2005-2009, the investment coefficient had passed from a modest 17 percent to approximately 25 percent. In addition, as was expected, the abundance of resources induced some inattention to the quality and price of the investments.

It is difficult to detangle the effect of Dutch disease from the structural constraints' effect on the modest growth of the economy. It is possible that there is a mutually reinforcing effect; for example, the increased emphasis on primary activities causes pressure to reduce the wages of the skilled workers, discourages their training and supply, thus aggravating the structural constraints on the growth of other sectors of the economy. On the other hand, in having an economy that is not very diversified, the incentive to import is great when income increases and the relative prices of imports decrease.

Dutch syndrome as a self-destructive process

There is a widespread tendency of economists to the pessimistic. In general, they say that the economy is in crisis and, if they do not find sufficient evidence to support their

views, they say that if there is not a crisis today, then tomorrow will be worse. This comment concerns Dutch disease, which the authors attribute to having the germs of its own self-destruction after a period of boom. There are certainly reasons to argue for this position, some of which were explained in the previous sections; the most serious is the displacement of domestic production by imports that are financed with windfall income.

Related to Dutch disease are some important questions. Was it possible to invest the revenues generated by the trade boom in developing other sectors in such a way as to avoid the displacement of domestic production? How long will the crisis last? Is the comparison between the costs and benefits of the boom necessarily negative? In theory, and mentioned so often in Latin America, it is possible to invest the benefits generated by the trade boom in order to develop other sectors. However, facts have proved that it is not easy to do that, to the point of having generalized the expression "the curse of natural resources". This is a result of the observation that resource abundance, especially natural resources, leads countries to be among the poorest in the world. However, there are no convincing explanations that this is necessarily so; then many economists and governments insist that it is possible to find the right strategy to generate a process of sustainable development using the boom income. They suggest state intervention in the economy under the hypothesis that the authority of the state is required to direct resources that, if left to the invisible hand of the market, would divert from production activities. This implies the introduction of elements of economic planning related to the real sector, government and in the monetary area, and requires estimates of the duration of both phases of the cycle, its amplitude and the desired or expected means of closing it (Morales 2012b).

There was awareness that the exploitation of natural resources would someday end; nevertheless, its abundance could be ensured for a long time. People showed more uneasiness regarding the evolution of the markets than for the exhaustion of reserves. The fear of a sudden drop in the international price of exports, as had occurred many times in the past, was always present in Latin America. Despite this, the fall in the prices of oil and minerals from the year 2014 caught the governments off guard. People also feared the reversal of capital flows due to the evolution of international interest

rates. There was distress as a result of variations of exchange rates that actually occurred in South America from 2015. Bolivia, using the exchange rate as an anti-inflation instrument, faces the risk of appreciating its currency even more.

The negative evolution of the international markets since the year 2014 may cause a hard landing, with all the damage that is usually attributed to Dutch disease.

The end of the trade boom

In the second half of the year 2012, the prices of minerals and agricultural products began to show decreasing trends. In 2015, the price of hydrocarbons collapsed. A barrel of oil, which was trading at more than $100 years earlier, dropped to less than $40. However, the F.M.I estimates that its price for the year 2016 will be slightly higher, reaching $43 dollars. Minerals' prices decreased by 40 percent. Something similar happened with the international prices of agricultural products, in particular, with the price of soybeans.

The export price drop closed the expansion phase of the boom. The expected consequences in the post boom period will be analyzed below.

Policies that could have been taken

Many of the fears mentioned above were well-grounded and for this reason it was wise to pay attention to them. During the boom, it was necessary to apply strategies of gains and losses' distribution over time, through a structured budget coordinated by the planning, monetary and finance authorities. Underlying this strategy was the idea of generating savings in the expansive phase of the cycle that could be used in the recessive phase and, thus, to avoid a hard landing. However, this strategy faces technical problems (i.e., estimating the duration of the cycle and its characteristics) and also encounters social and political problems. Among these is the impatience of people wanting to use all the available resources (and even more if necessary) to accelerate

development and to reduce poverty. Redistributive conflicts in the quest for the appropriation of the maximum available resources usually also create obstacles to savings that should be kept for the recessionary period. Among the political obstacles is the reluctance of governments to preserve saving available to their successors, especially when they are the political opposition. One problem is also that of political discourse that attributes economic growth to good national policies, denying the external impact, leading to the people demanding that, if the government is re-elected, it will continue with its policies of extending the boom and avoiding the downward phase of the cycle.

The design and implementation of structured budgets requires: a good level of inter-agency coordination, good management of the instruments of prognosis, room for a fiscal policy, margin for the control of the exchange rate, efficiency and discipline of the public institutions and the efficiency and soundness of the financial system (more detailed explanations on these points are found in R. Morales (2012b) and in the cited literature). An instrument to achieve structured budgets is a computable general equilibrium model. Chile has pioneered the approach of structured budgets; nevertheless, it could not achieve good outcomes. Bolivia, without an expressed intention, accumulated savings and also international reserves. This process arises in institutional-level, decentralized entities' weaknesses that involve a slow pace in the execution of investments.

The application of prudential policies to achieve a soft landing in the self-destructive cycle has appeared recently in the economic literature, and has achieved no consensus. In the 70s, when the price of oil rose, it was suggested to accelerate growth in order to strengthen and diversify production structures, and to face the downward phase of the cycle. Ecuador and Venezuela planned to diversify their economies. In Bolivia, in the Tin boom times, partnered expressions changed and a revolution in economic diversification was undertaken using resources from mining.

The great difficulty of giving a good destination to the income of the trade boom was structural, and refers to restrictions that hinder investments and growth. These will include the lack of enterprise leadership and the scarcity of skilled workers, the

weakness of institutions, the low capacity of planning and management, markets' failures (especially in the financial sector and in the labor market) powerful interest groups making selfish decisions and little development of political expertise for the adoption of good policies. However, in the past, these problems might sometimes be faced with success and sometimes without it, so it is not possible to be conclusive.

As expected, the use of revenue windfalls to activate the demand in the face of a slow reaction of the local production led this strategy to cause inflation. Today, more than one-digit inflation is considered dangerous, but it was not the same in the past. However, we cannot ignore the risk of failing in the attempt to accelerate the growth and triggering an inflationary process. During the boom, several Latin American countries, including Bolivia, Ecuador and Venezuela, have elaborated projects to take advantage of the current boom to accelerate growth, looking for a better future, but the policies taken were not always efficient.

An econometric model

In order to verify the consistency of the previous analysis, a simultaneous equation model has been estimated which illustrates the dependence of the Bolivian economy on its external sector and its implications for employment. The model does not attempt to be predictive, but its estimates are useful to assess changes that may occur in the immediate future (over the next four years) as a result of export prices falling.

The model seeks to estimate econometric relations into five blocks of variables: 1) employment, 2) national accounts, 3) accounts of the public sector 4) money and prices and 5) the balance of payments. To unify units and to avoid the inertia effect, the model is stated along with growth rates and proportions.

A central equation of the model explains the growth rate of GDP according to three production factors: variations in capital, labor and public spending. Capital variations are expressed in terms of the growth rate of the gross capital's formation. Employment has three components: the inertia growth of the labor supply, which is equal to

population growth and which overlaps the constant; the proportion of the unemployed (unemployment rate) and the proportion of informal workers (informal rate among occupied workers). Unemployment negatively affects the amount of employment, and then the growth. On the other hand, informal employment affects growth positively, its evolution is associated with the unemployment rate and its relation with imports has an inverse U-shape. The third variable explaining the GDP's growth rate is the public expenditure that depends on the evolution of the income of the public sector, which in turn is a function of international oil prices.

The investment growth rate depends on the rate of import growth and on GDP growth over the last year.

Imports rely on the exports gain, which provides the resources to finance them, and on investment variations.

Exports depend positively on the export price index and on variations in the real exchange rate. They depend negatively on the growth rate of GDP in the previous year and have a cyclical component represented by a dummy variable.

Private consumption is determined by an identity with GDP, public consumption, investment and exports and imports.

The rate of change in the CPI depends positively on the rate of the change of import prices, and the rate of change in the money supply from the previous year.

The rate of change in the GDP deflator is correlated to the rate of change in the CPI.

Changes in the money supply are associated with changes in the CPI of both the current year and the previous year, the rate of the price of exports and changes in the monetary base.

With the purpose of estimating changes in the monetary base, the model includes the loan that the Central Bank made to the public sector to finance its deficit (positive or negative).

The model has 13 equations and 21 identities, which are described in the tables that follow:

	EQUATIONS			
Dependent variables		Independent variables		Detail
No	Endogenus	Endogenous	Exogenous	
1	xylogit	tpib		logit of the unemployment rate
2	xinlog	ylogit, timpo, xx2		logit of the informality rate
3	tpib	tfbc, xinlog, gpub	l.xylogit	GDP growth rate
4	tcpub	gpub, dboom	dboom	Governemt consomation growth rate
5	tfbc	l.tpib timpo		Investment growth rate
6	timpo	rexy , fbc		Import growth rate
7	texpo	tcr	tindpx, l.tpib, dboom	Export growth rate
8	rpub		phid	Governement income % GDP
9	gpub	rpub	polbcb	Governement expenditure % PIB
10	tipc		tpm, l.tm2	Consumer Price Index rate
11	tpn	tipc	tindpx	GDP deflactor raste
12	pcred	dpub		Bank Central credito to Governement % PIB
13	tm2	tipc, tbase2	tindpx, l.tipc	Money supply variation rate

	IDENTITIES			
Variable dependent		Independent variables		Detail
No	Endogenus	Endogenous	Exogenous	
1	cpub	tcpub	l.cpub	Government consomation
2	cpriv	tcpriv	l.cpriv	Private consommation
3	fbc	tfbc	l.fbc	Investment
4	impo	timpo	l.impo	Imports
5	expo	texpo	l.expo	Exports
6	pn	tpn	l.pn	GDP deflactor
7	pib	tpib	l.pib	GDP
8	dpub	rpub, gpub		Income less Expenditure of Government
9	credpub	pcred, pn, pib		Loan of the Central Bank to Government
10	cor	expo, impo,	pxus, pmus, tcn, intere	Current Account of Paiment Balance (PB)
11	drin	cor	cap	International reserve variation in the PB
12	rin	drin	l.rin	Net International Reserves
13	debt		xdebt, l.debt	External debt
14	interes		debt,xlib	Interest payment on external debt
15	tcr	pn	pext	International consumer price
16	base	rin,credpub	credban, srd, otbase	Monetary Base
17	tbase	base	l.base	Rate of variation of the Monetary Base
18	xx2	timpo		Square Import growth rate
19	rex	expo, impo, pn	px, l.px, l.expo	Export variations at constant prices
20	rexy	rex		Growth rate of the export variations at constant price

The econometric estimation of this model (see the Annex) confirms the previous assumption concerning the Bolivian economy's functioning: particularly, it confirms: a) the high dependence of the economic growth on export prices, b) that the unemployment rate depends on the growth rate and c) that informality depends positively on the unemployment rate and has an eclectic behavior related to imports.

dient	Exogenous variables	
No	Exogenous variables	Detail
1	phid	Hidrocarbon prince index
2	pxus	Export price index for the PB
3	pmus	Import price index for the PB
4	pm	Import price index for National Accounts
5	prx	Export price index for National Accounts
6	otbase	Other exogenous items of the Monetary Base
7	lib	Interest rate of the external debt
8	tindpx	Export price growth rate
9	dboom	Dummy. 1 for 2012, 2013, 2014
10	otbp	Other exogenous items of PB
11	pext	International consumer price index
	Control variables	Detail
12	tcn	Nominal exchange rate
13	polbcb	Dummy. Bank Central policy related to Government loan 1 para 2013, 2014
14	cap	Capital Account of PB
15	xdebt	Net debt disbursement in PB
16	otcap	Other items of the Capital Account of PB
17	credban	Bank Central credit to banks
18	srd	letras del tesoro
19	tcn	tipo de cambio nominal (bs por dólar)
20	adj_tcn	Nominal exchange rate ajusted for calculete the Monetary Base

Conclusions

What it is possible to expect

With the support of a simulation exercise using the econometric model that has been previously explained, it is possible to elaborate some qualitative forecasts for the period 2015-2018, contrasting them with the results of the period 2011-2014 when the high prices of Bolivian exports were still current.

The assumptions regarding exogenous variables are:

- The price of hydrocarbons will decrease by 40 percent in 2015 and will have subsequent additional decreases of 3%. Export prices will follow the same tendency.
- The price of imports will be equal to the simple arithmetic mean of the two previous years.

- The capital account of the balance of payments and net disbursements of the external debt are estimated as the simple arithmetic mean of the three previous years.
- The exogenous components of the monetary base are estimated using the averages of the two previous years.
- We assume that the nominal exchange rate will remain unchanged and that the Central Bank will continue intervening to finance the deficit in the government's budget.

The model forecast outcome for the period 2015-2018 leads to the following conclusions:

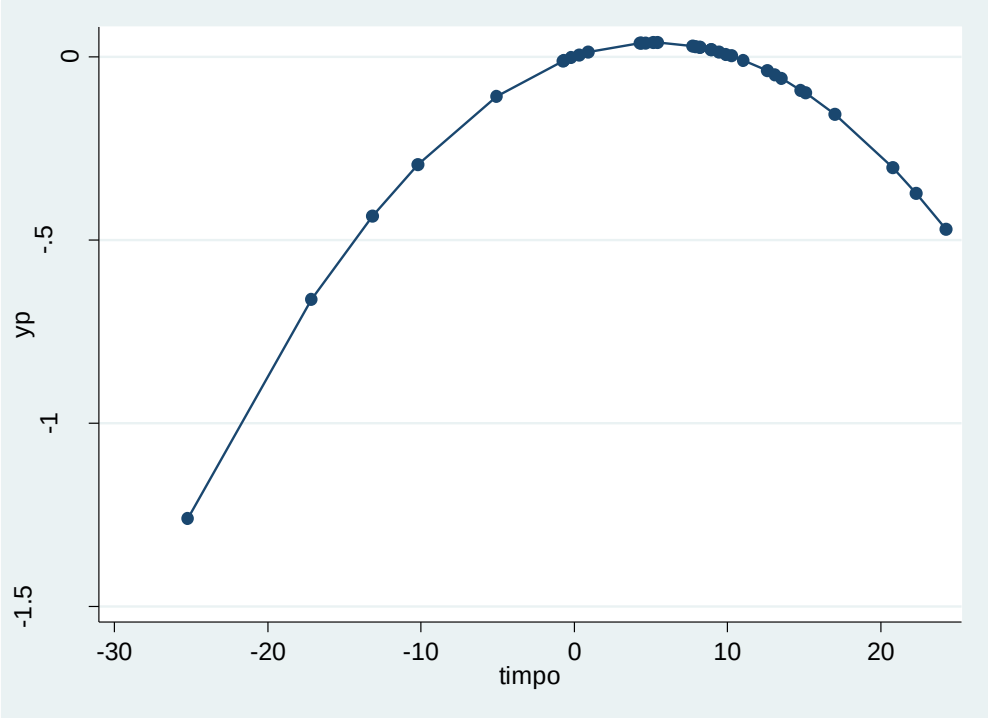
- From an average of 5.7 percent of GDP between the years 2011 and 2014, the growth rate might decline to 3 percent for the period 2015-2018.
- The public consumption will grow although slowly than the previous period.
- Private consumption may decrease.
- The investment coefficient may register a significant fall, moving from 23 percent to 13 percent of the GDP.
- Imports will tend to decline but exports (at constant prices) will continue to grow.
- The unemployment rate will increase, possibly up to 10 percent.
- The rate of informality will decrease slightly.
- The country will continue to borrow, and the external debt will rise to 22 percent of the GDP
- The public sector could have a deficit of 4.6 percent, demanding Central Bank financing.
- Inflation will remain controlled, but the real exchange rate will drop again.
- Exports and imports at current prices will suffer a major fall, accompanied by a sharp decline in the trade balance.
- The current account of the balance of payments will be negative.
- External indebtedness will finance the deficit in the current account; in addition, the government will try to preserve the current level of international reserves with external debt.

Probable issues in the labor market

In the absence of specific policies to support employment, the negative relationship between the unemployment rate and economic growth is something common to all countries[2]. Therefore, from the perspective of the slowdown in growth, it is possible to expect a rise in unemployment.

On the other hand, it is also common to assume that when unemployment goes up, informality increases. What is more surprising is the relationship between the rate of informality and the growth rate of imports (in volume), which appears to have an inverted U-shape. This can be explained in the following way: the growth of imports offers new opportunities in the retail sector of consumer goods, involving informality growth accompanied by higher earnings. Arriving at a certain point, GDP and imports' growth and diversification leads to a greater formality involving the reduction of unemployment and informality. The relationship between (the logit) informality rate and the import growth rate is illustrated by the following chart:

[2] The Okun law proposes a relationship between the fluctuation of the product and unemployment. For more detail, see IADB 2016.


0
-.5
-1
-1.5
yp
-30
-20
-10
0
10
20
timpo

Annex. The Econometric Model Estimation

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
xylogit	19	1	.3866804	0.4393	33.56	0.0000
xinlog	19	3	.1513973	0.6431	66.69	0.0000
tpib	19	4	1.058551	0.5846	107.20	0.0000
tcpub	19	2	1.323998	0.4710	54.19	0.0000
tfbc	19	2	9.347024	0.6361	87.36	0.0000
timpo	19	2	4.167191	0.7707	131.51	0.0000
texpo	19	4	4.431695	0.6334	51.23	0.0000
rpub	19	1	3.396663	0.7757	91.94	0.0000
gpub	19	2	1.915728	0.8314	159.16	0.0000
tipc	19	2	2.30551	0.7747	138.22	0.0000
tpn	19	2	2.57841	0.7303	118.58	0.0000
tm2	19	4	5.059958	0.7207	99.58	0.0000
pcred	19	1	1.912457	0.6239	80.11	0.0000

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
xylogit						
tpib	-.2047116	.0353359	-5.79	0.000	-.2739688	-.1354544
_cons	-1.615934	.1672425	-9.66	0.000	-1.943723	-1.288145
xinlog						
xylogit	.3132949	.0513761	6.10	0.000	.2125996	.4139902
timpo	.0145962	.0035808	4.08	0.000	.007578	.0216144
xx2	-.0014047	.0002359	-5.96	0.000	-.0018669	-.0009424
_cons	1.140399	.1273556	8.95	0.000	.8907869	1.390012
tpib						
tfbc	.038738	.009336	4.15	0.000	.0204399	.0570362
xylogit						
L1.	-1.569618	.3054602	-5.14	0.000	-2.168309	-.9709272
gpub	.222742	.0366266	6.08	0.000	.1509551	.2945289
xinlog	3.524144	.5813411	6.06	0.000	2.384736	4.663551
_cons	-9.890853	1.635	-6.05	0.000	-13.09539	-6.686312
tcpub						
gpub	.1657412	.0496848	3.34	0.001	.0683609	.2631216
dboom	2.136329	.5630418	3.79	0.000	1.032787	3.23987
_cons	-2.616314	1.93554	-1.35	0.176	-6.409902	1.177275
tfbc						
tpib						
L1.	1.818965	.6773441	2.69	0.007	.4913953	3.146535
timpo	1.365907	.1496908	9.12	0.000	1.072519	1.659296
_cons	-8.40158	3.632083	-2.31	0.021	-15.52033	-1.282827
timpo						
rexy	23.24198	4.179138	5.56	0.000	15.05102	31.43294
tfbc	.3774953	.0420542	8.98	0.000	.2950706	.45992
_cons	-.3824026	1.116303	-0.34	0.732	-2.570315	1.80551
texpo						
tindpx	22.46661	6.468494	3.47	0.001	9.788589	35.14462
tpib						
L1.	-1.603289	.4223897	-3.80	0.000	-2.431157	-.7754201
tcr	.8535974	.1575812	5.42	0.000	.5447439	1.162451
dboom	11.37453	2.35306	4.83	0.000	6.762616	15.98644
_cons	10.43739	1.921966	5.43	0.000	6.670404	14.20437

rpub						
phid	.195156	.0203534	9.59	0.000	.1552641	.2350479
_cons	28.13088	1.208674	23.27	0.000	25.76193	30.49984
gpub						
rpub	.4821063	.0429426	11.23	0.000	.3979404	.5662723
polbcb	2.943079	.8242031	3.57	0.000	1.32767	4.558487
_cons	21.20207	1.637049	12.95	0.000	17.99351	24.41062
tipc						
tpm	.4941278	.0588263	8.40	0.000	.3788304	.6094251
tm2						
L1.	.1814816	.037064	4.90	0.000	.1088376	.2541256
_cons	1.704614	.7133334	2.39	0.017	.3065057	3.102721
tpn						
tipc	.9131362	.0889373	10.27	0.000	.7388223	1.08745
tindpx	13.50483	3.354986	4.03	0.000	6.929183	20.08049
_cons	.3696374	.860548	0.43	0.668	-1.317006	2.056281
tm2						
tipc	.6679981	.2276244	2.93	0.003	.2218624	1.114134
tbase2	.1362179	.0499182	2.73	0.006	.0383801	.2340558
tindpx	-41.22229	9.823735	-4.20	0.000	-60.47646	-21.96812
tipc						
L1.	.5272531	.2296817	2.30	0.022	.0770851	.977421
_cons	-3.747072	1.904812	-1.97	0.049	-7.480435	-.0137083
pcred						
dpub	-.6842576	.0764499	-8.95	0.000	-.8340966	-.5344186
_cons	-2.669146	.4728888	-5.64	0.000	-3.595991	-1.742301

Endogenous variables: xylogit xinlog tpib tcpub tfbc timpo texpo rpub gpub tipc tpn tm2 pcred rexy xx2 dpub tcr
Exogenous variables: L.xylogit dboom L.tpib tindpx phid polbcb tpm L.tm2 tbase2 L.tipc credban srd otbase xlib otbp2 pext

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