

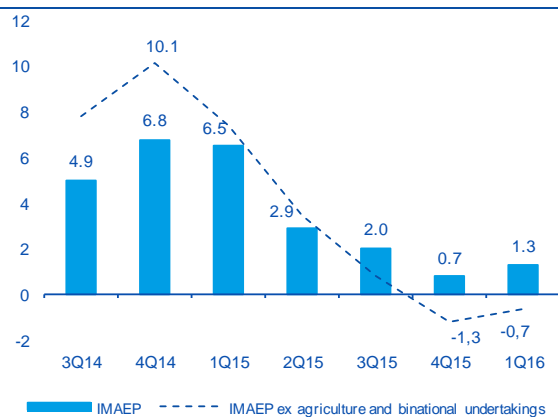
### 3 Paraguay: we projected growth of around 3% for 2016 and 2017

#### Sluggishness of GDP in the first half of the year given the weakness of the activities related to domestic demand

The economic activity indicator, IMAEP<sup>1</sup>, rose 1.3% YoY in the first quarter, maintaining a similar pace to the previous three months (see Figure 3.1). Domestically, however, the growth recorded was differentiated by components. On the one hand, the set of sectors that respond to supply items such as power generation (binational) and agriculture continue to have positive results in the first three months. On the other, activities more closely linked to domestic demand, such as trade, construction and industry, continued to fall. Thus, the IMAEP, which excludes agriculture and binational industries, contracted by 0.7% in the period.

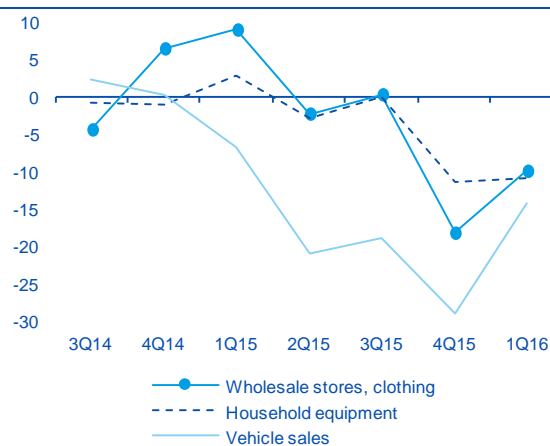
During the quarter, commercial activities of durable goods such as vehicle sales, retailing, clothing and household equipment were in negative territory (see Figure 3.2). This slowdown in commercial sector is due to weakening sales in border cities, which is mainly explained by lower economic activity in neighbouring countries, particularly Brazil. In addition, some specific supply factors were recorded, such as a significant slowdown in construction, as a result of higher rainfall (the “El Niño” phenomenon), which hindered the normal execution of works in the private and public sectors. On the expenditure side, these factors reflect slower growth in consumption and investment.

Figure 3.1  
Economic activity indicator, IMAEP  
(chge. % YoY)



Source: BCP and BBVA Research

Figure 3.2  
Turnover indicators, ECN  
(chge. % YoY)



Source: BCP and BBVA Research

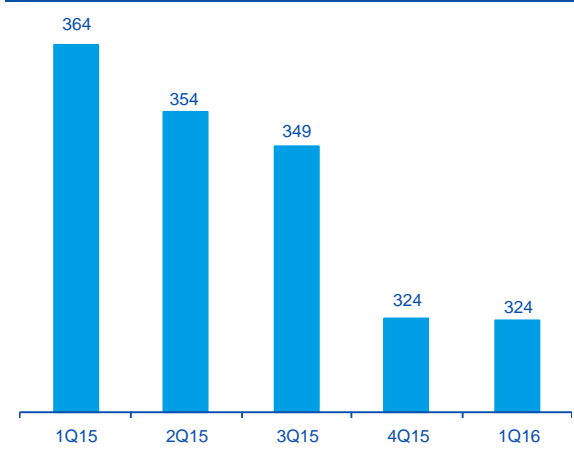
#### Extractive industries gave support to GDP

On the positive side, the agricultural sector (20% of total GDP) has shown favourable results in the first half of the year. It is estimated that the soya beans campaign increased by more than 10% over the previous year's production, due to higher yields, which has provided some relief in the margins of farmers which were already being squeezed or which in some cases were negative. This, in an environment where the international price has begun to show some stability (see Figure 3.3). Also noteworthy in the first months was the increased power generation, following the increased water flow brought about by the presence of the “El

1: The Monthly Economic Activity Indicator in Paraguay (IMAEP) is designed to deliver signals in the short term on the evolution of the economy in constant terms. The IMAEP incorporates preliminary information and does not include all the data for economic activities that make up Gross Domestic Product, and must therefore be regarded as an indicator of the path of the Paraguayan economy in the short term.

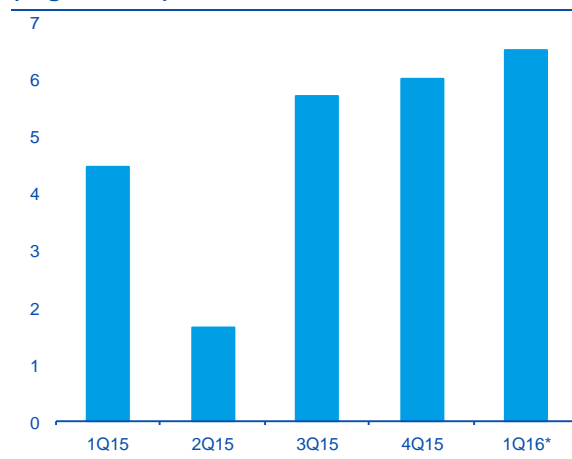
Niño” phenomenon. Thus, the production of all sectors responding to elements of supply (electricity and agriculture) maintained a positive result, which we estimate as having expanded by more than 6.0% (see Figure 3.4). On the expenditure side, these trends were reflected in increased exports (soya beans and electricity together have a weight of around 45% of total exports).

Figure 3.3  
**Price of soya beans  
(USD/Tonne)**



Source: BCP and BBVA Research

Figure 3.4  
**Agriculture and electricity sector (binational)\*  
(chge. % YoY)**



\*Own Estimate  
Source: BCP and BBVA Research

**Going forward we expect a boost in infrastructure projects such that we project growth of around 3% in 2016 and 2017**

The scenario for 2016-2017 will be complex and we are taking the following exogenous factors into account:

- On the external side, our estimates take the following into account:
  - (i) Relatively stable price of soya beans. The adjustments in global supply would be offset by the effects of weaker demand, primarily in China.
  - (ii) The Brazilian economy deteriorated in 2016 (-3.0%), but would show a slight recovery in 2017 (0.9%), strongly conditioned by political uncertainty and the fiscal adjustments to be made.
  - (iii) The Fed rate normalisation process will remain surrounded by uncertainty, suggesting bouts of volatility in local financial markets, which, if persistent, could have a real impact.
- On the domestic side, we assume that:
  - (iv) Government spending on goods and services (particularly salaries) is consistent with the fiscal rule.
  - (v) Infrastructure works will have a more noticeable impact.

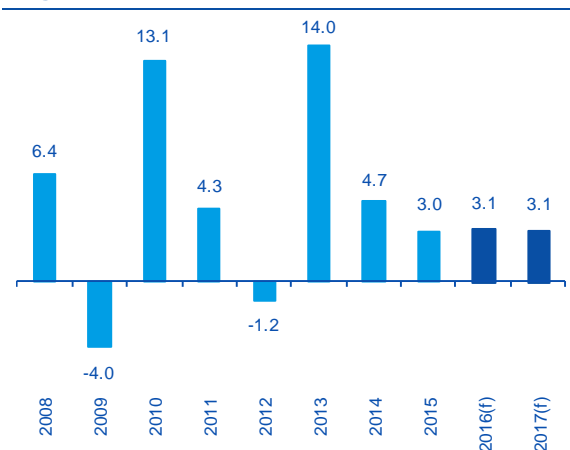
Our central scenario assumes that GDP will begin a process of gradual recovery throughout this year, and will thus record growth in 2016 of around 3% (see Figure 3.5).

By sectors, activity will be driven by agriculture (for the coming quarters, in addition to soya beans, there are good prospects for corn and wheat production), electricity and services, which would continue with the good performance in the first part of the year, and construction, which would begin to show a recovery alongside the reversal of the isolated shocks that affected the first quarter. In addition, a recovery in livestock is expected after contracting in 2015 because, according to industry benchmarks, to date, the average price of meat has risen and this would ensure a good margin for the breeder, boosting investment and production.

On the expenditure side, growth will be driven by exports (soya beans and their derivatives, electricity and meat) and domestic demand due to increased construction (see Table 3.1).

For 2017 we project a similar rate to 2016, where the main driver of growth will continue to be domestic demand, in particular due to higher levels of private and public investment. It is estimated that to the infrastructure projects that are already underway or scheduled (such as the improvement of roads, highways, country roads and so on), new projects will be added which are to be developed under the Public Private Partnership (PPP) scheme, which will confer sustainability to growth. It should be noted that investment in infrastructure, besides favouring the sectoral diversification of total investment by making it less susceptible to the volatility of raw material prices, also generates significant positive externalities and has a direct and widespread impact on the levels of productivity and welfare in society.

Figure 3.5  
**Annual GDP**  
(chge. % YoY)



Source: BCP and BBVA Research

Table 3.1  
**GDP on expenditure side**  
(chge. % YoY)

	2014	2015	2016 (f)	2017 (f)
<b>Domestic demand</b>	<b>5.3</b>	<b>2.5</b>	<b>2.5</b>	<b>3.0</b>
Total consumption*	3.8	2.8	2.7	3.2
Gross capital formation**	11.0	1.5	4.5	5.5
<b>External demand</b>	<b>-3.1</b>	<b>9.3</b>	<b>3.2</b>	<b>-4.6</b>
<b>Gross domestic product</b>	<b>4.7</b>	<b>3.0</b>	<b>3.1</b>	<b>3.1</b>

\*Considers private and public consumption.

\*\*Considers gross fixed investment and inventories.

Source: BCP and BBVA Research

From 2017, with activity still being driven by the sharper recovery in external demand, which will have a noticeable impact not only on export levels but also on border trade, and infrastructure projects in sectors such as roads, water and sanitation, and electric power transmission and distribution, we anticipate that growth in Paraguay will be 4.0% on average, in line with the potential growth (see Box 1. Updating of the potential growth of Paraguay).

## Box 1. Updating of the potential growth of Paraguay

Potential GDP is defined as the level of production which an economy is able to create when it is using its resources at full capacity and without creating macroeconomic imbalances.

A characteristic of this variable is that it cannot be directly observed. In order to estimate potential GDP, in fact, we need to apply a number of different methods, which can generally be divided into statistical and economic methods.

Statistical methods mainly use filters to isolate the trend or long-term component (Hodrick and Prescott<sup>2</sup>, Baxter and King<sup>3</sup>, inter alia). Methods based on economic models adopt a more intuitive approach by using an analytical framework in which potential GDP is an endogenous variable which is related to other variables. The “production function” is one of the methods used in this latter category. This method estimates potential GDP based on its determining factors (in essence, output, employment and capital).

### Production function

In this case, a Cobb-Douglas production function is used with constant returns to scale and adjusted by human capital (García-Fuentes and Lynn, 2009<sup>4</sup>, and Hofman and Tapia, 2003<sup>5</sup>):

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

where,  $Y_t$  is gross domestic product,  $A_t$  is output,  $K_t$  is physical capital stock,  $h_t$  is the factor of human capital and  $L_t$  is the number of workers. All the variables have an annual frequency. Also,  $\alpha$  is the participation of physical capital in GDP, while  $1 - \alpha$  represents the participation of employment and human capital.

The relevant variables used in the estimate are calculated as follows:

**a. Capital stock:** As there is no direct measurement of physical capital stock

( $K_t$ ), it was decided to generate a historical series from 1994, using the perpetual inventory method:

- Conventional capital accumulation:  $K_{t+1} = (1 - \delta)K_t + I_t$ ; where  $I_t$  is the level of investment and  $\delta$  is the depreciation rate. A straight-line depreciation function, with a 30-year useful life span for the capital, is assumed.
- In order to define the initial capital stock ( $K_0$ ) a steady state scenario is assumed in 1994:  $K_0 = \frac{I^*}{g+d}$ 
  - where,  $I^*$  is the average of the Investment/GDP ratio between 1994-2015 and GDP for 1994.
  - On the other hand,  $g$  is the average of the rate of growth in GDP between 1994-2015.

**b. Capital-GDP elasticity:** The value of  $\alpha = 0,42$  is taken, in line with the estimates made by the Central Bank of Paraguay<sup>6</sup>.

**c. Human capital:** As with capital stock, there is no direct measurement of human capital ( $h_t$ ). The following equation is used to generate this variable:

$$h_t = \exp \left[ \left( \frac{\theta}{1-\psi} \right) s_t^{1-\psi} \right]$$

where  $s_t$  represents the average years of schooling of the population aged over 15, while  $\theta$  and  $\psi$  are sensitivity and curve parameters of the function which adopt values of 0.32 and 0.58 respectively, in accordance with the proposals of Bils and Klenow (1998)<sup>7</sup>.

**d. Workforce:** The workforce is considered to be ( $L_t$ ) the Occupied Economically Active Population.

<sup>2</sup> Hodrick, R. and Prescott, E. (1997), “Postwar U. S. Business Cycles: An Empirical Investigation”, *Journal of Money, Credit And Banking*, Vol. 29, No. 1.

<sup>3</sup> Baxter, M. and King, R. (1995), “Measuring Business Cycles Approximate Band-Pass Filters For The Economic Time Series”, National Bureau Of Economic Research, Working Paper No. 5022.

<sup>4</sup> García-Fuentes, P. and Lynn, P. (2009), “Remittances and Economic Growth in Latin America and the Caribbean: The Impact of Human Capital Development”. Southern Agricultural Economics Association Annual Meeting, Atlanta, Georgia.

<sup>5</sup> Hofman, A. and Tapia, H. (2003) “Potential output in Latin America: a standard approach for the 1950-2002 period”, *Serie Estudios estadísticos y prospectivos* No25, CEPAL.

<sup>6</sup> See IPoM box, December 2014.

<sup>7</sup> Bils, M. and Klenow, P. (1998), “Does Schooling Cause Growth or the Other Way Around?”. National Bureau of Economic Research (Cambridge, MA) Working Paper No. 6393.

**e. Total Factor Productivity (TFP):** The TFP is obtained as the result of the following:

$$A_t = \exp[\log Y_t - \alpha \log K_t - (1 - \alpha) \log h_t - (1 - \alpha) \log L_t]$$

Lastly, to construct the series of potential GDP,  $Y_t^*$ , the procedure is as follows:

$$Y_t^* = A_t^* K_t^{*\alpha} (h_t^* L_t^*)^{1-\alpha}$$

$A_t^*$ ,  $h_t^*$ ,  $k_t^*$  and  $L_t^*$  are the trends of output, human capital and employment obtained using the Hodrick-Prescott filter.

### Main results

If we analyse potential GDP, it is apparent that the growth of the economy during the boom phase was not only a temporary or cyclical phenomenon. Table 1, which contains the breakdown of the growth of potential GDP between production and output factors (controlling for human capital), shows the prominence of all the factors in the accelerated growth of the Paraguayan economy between 2002 and 2013.

This same approach also shows that not only short-term factors are behind the slowdown observed in recent years (since 2013). For example, a significant decline in the contribution made by output is apparent, which suggests that there are structural factors behind this growth trend that is shifting the economy towards permanently slower growth rates (see Table R.1.1).

Table R.1.10

#### Potential GDP (chge. % annual, percentage points)

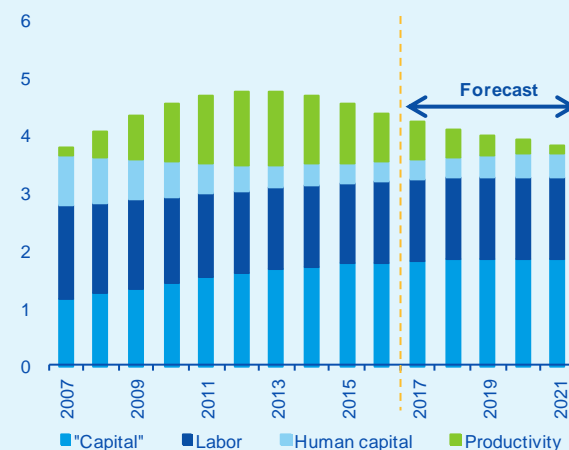
	Potential growth	Contribution to growth			
		A	K	h	L
1994-2001	1.1	-1.8	1.1	0.7	1.1
2002-2013	3.7	0.1	1.2	0.8	1.6
2014-2015	4.6	1.1	1.8	0.4	1.4
2016-2020	4.1	0.5	1.9	0.4	1.4

Where, A: Output, K: Physical capital, h: Human capital, L: Employment.  
Source: BCP, World Bank and BBVA Research

For the next few years, in line with our macroeconomic projections, it is estimated that the contribution of both productivity and employment to the growth of potential GDP will stagnate at the low levels currently being recorded. Meanwhile, the contribution of capital (linked to investment) would still provide support to overall activity. As a result of these projected trends, sustainable growth of the Paraguayan economy is expected to decline in future years and be in the vicinity of 4.0% (see Figure R.1.1).

Figure R.1.1

#### Potential GDP: contribution to growth (percentage points)



Source: BCP, World Bank and BBVA Research

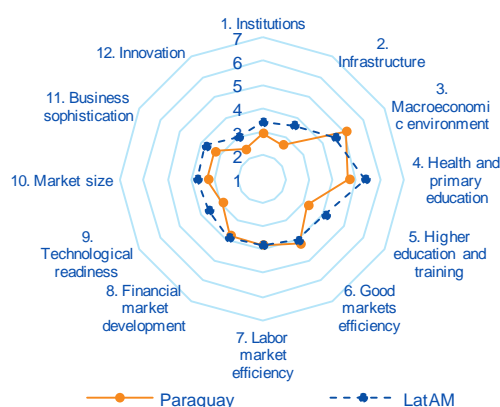
## Ensuring a faster rate of growth in the medium term will require a focus on making advances in competitiveness and productivity

According to the Global Competitiveness Index published by the World Economic Forum (WEF) 2015-2016, Paraguay is ranked 118 out of a total of 140 countries. An examination of the 12 factors covered by the WEF shows that, within the region, the country lags behind in key areas such as Infrastructure, Higher Education and Training and Innovation (see Figure 3.6). These elements negatively affect the potential growth of the Paraguayan economy.

Mainly in infrastructure, various indicators show that Paraguay has a level of development that is still below its needs. According to the Central Bank<sup>8</sup>, less than 20% of the entire road network is paved, while 75% is made up of dirt and gravel roads. Regarding ports, the infrastructure shortcomings mainly reside in the lack of dredging and buoying of rivers that restricts the carrying capacity of vessels and impedes navigation by night. As for electrical infrastructure, while Paraguay is the leader in per capita generation in Latin America, the greatest deficiencies are associated with losses during the transmission and distribution processes. Thus, an average loss of electricity of 32% is estimated, much higher than that recorded in Latin America as a whole (17%), and the 6% verified in high-income countries which is used as a benchmark threshold (see Figure 3.7).

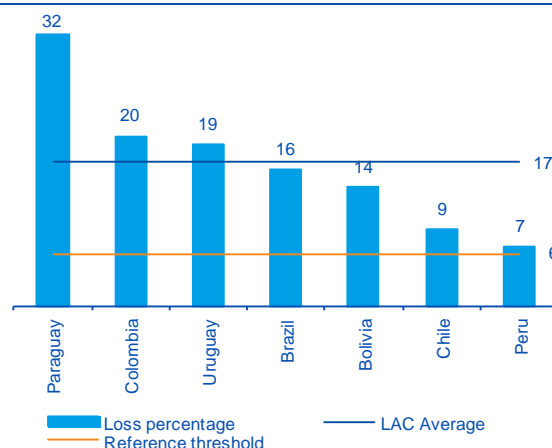
Considering the foregoing, and although macroeconomic stability is a distinguishing feature of the economy of Paraguay (according to the WEF, the country has a better macroeconomic environment than the Latin American bloc in general, see Figure 3.6), it is clear that to sustain economic growth at around 4.0% beyond the forecast horizon, it is essential to implement measures and/or reforms to strengthen productivity and competitiveness.

Figure 3.6  
**Global Competitiveness Index 2015-2016**  
(Index between 1 “worst” and 7 “best”)



Source: World Economic Forum and BBVA Research

Figure 3.7  
**Losses in power generation**  
(% of total, average 2007-2011)



Source: BCP and BBVA Research

In this context, the main medium-term challenges must be focused on implementing policy measures that seek to: i) continue cutting the gap in infrastructure (see Box 2. The importance of infrastructure development), ii) improve the business climate and increase competition and, iii) reduce overruns in the economy.

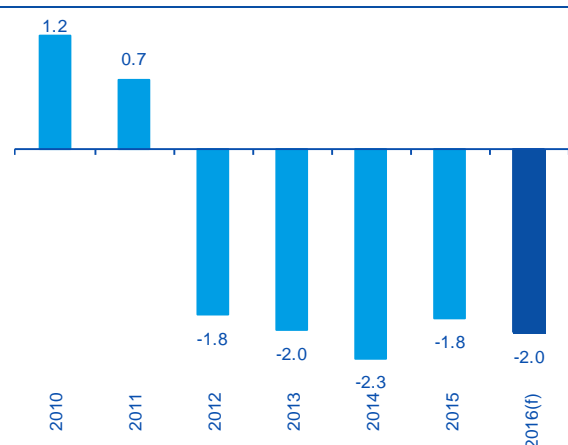
8: Central Bank of Paraguay (2016). “Paraguay: beyond macroeconomic stability. Achievements and challenges”.

## Fiscal accounts will continue to record deficits

By 2016, we expect that the fiscal deficit will be at about 2.0% of GDP, in a context where incomes will be weaker due to the slowdown in highly taxed economic activities (services sector and re-exports) and the decrease in the prices of raw materials. Also, increased capital expenditure will be recorded oriented towards the infrastructure projects prioritised by the government. While the Transparency and Accountability Act (LTRF) sets a limit for the fiscal deficit at 1.5% of GDP, our forecast assumes that the government, despite making adjustments to keep the deficit within the limits set out in the Act, will not meet the limit established for this year. Going forward we estimate a gradual reduction of the deficit so that the limit in the Transparency and Accountability Act is met, which will help consolidate the credibility of the fiscal rule (see Figure 3.8).

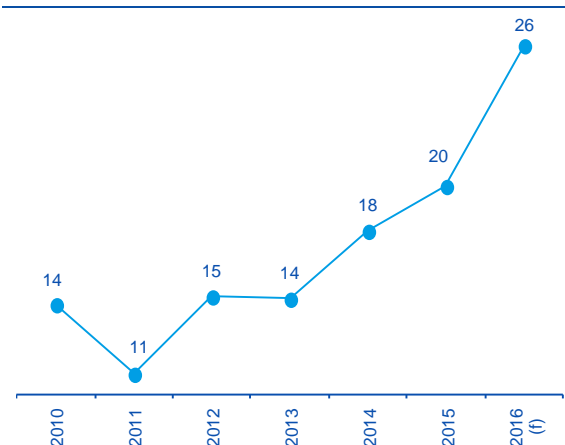
In the context of the fiscal deficits of the last four years, external financing needs have become more significant. Indeed, since Paraguay entered the international financial markets in 2013, 4 public debt issues have been carried out for a total amount of USD 2.38 billion (9.1% of GDP). Thus, the balance of gross public debt increased by about 9 percentage points of GDP between 2013 and 2016. This year, meanwhile, it is estimated that gross public sector debt will exceed 26% of GDP (see Figure 3.9). Also, according to the IMF, this debt will reach levels above 28% of GDP as of 2018. While this increase in the public debt ratio would be fast, it does not reveal the beginning of growing momentum affecting the sustainability of public finances (to the extent that spending on infrastructure remains the top priority, in particular the improvement of power distribution and transport).

Figure 3.8  
**Fiscal balance**  
(% of GDP)



Source: BCP and BBVA Research

Figure 3.9  
**Public debt**  
(% of GDP)



Source: BCP, IMF and BBVA Research

Finally, it should be noted that according to a recent report by Moody's, and considering a combination of low debt and reduced use of resources for the payment of interest, apart from Chile, Paraguay is the only country in the Latin American bloc that has the ability to increase public spending without causing a deterioration of the health and sustainability of its fiscal accounts.

## The external deficit will be corrected and will be funded largely by long-term capital

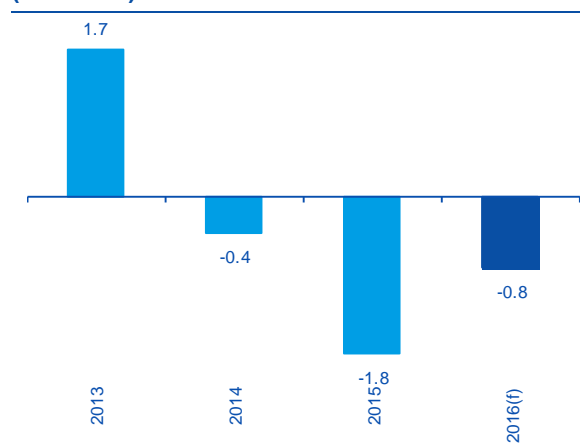
During the first quarter, the trade balance recorded a surplus of USD 575 million, in a context where imports (-21%) decreased more than exports (-15%). In the case of imports, the biggest declines were seen in inputs (-27%) and capital goods (-19%), reflecting the weakness of domestic demand. Exports, meanwhile, fell as a result of lower soya beans and derivatives shipments (-15%, particularly due to prices) and meat (-15%), which together represent 50% of total exports.



In this scenario, our projection of the current account deficit for 2016 is 0.8% of GDP, lower than in 2015 (1.8% of GDP, see Figure 3.10). This result is explained by a higher surplus in the trade balance, mainly due to lower imports, especially of capital goods. For the period 2017-20, our forecasts assume a gradual reduction of the external deficit, given the recovery in energy exports and Brazilian demand for products with higher added value.

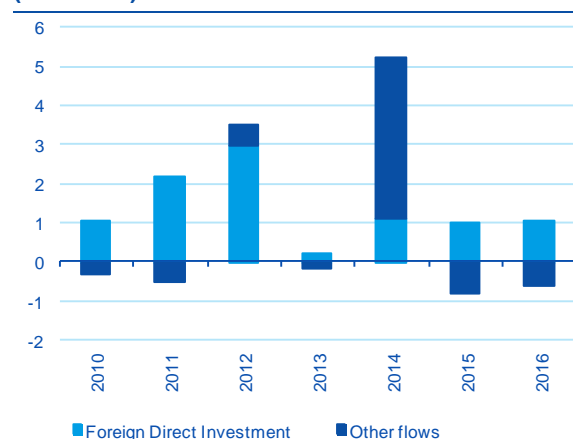
Regarding sources of funding, by 2016 we expect foreign direct investment (FDI) flows similar to those of last year (1.0% of GDP, see Figure 3.11), which would allow for more than the mere financing of the external deficit. In the coming years, it is estimated that FDI into the country will continue to be favoured by infrastructure projects that would provide an opportunity for the entry of this type of capital.

Figure 3.10  
**Current account**  
(% of GDP)



Source: BCP and BBVA Research

Figure 3.11  
**Financial account**  
(% of GDP)



Source: BCP and BBVA Research



## Box 2. The importance of infrastructure development

### Infrastructure and economic development

In economic literature, there is much evidence that the efficient provision of infrastructure services is one of the most important factors in development policies due to its positive impact on the productivity of other factors of production.

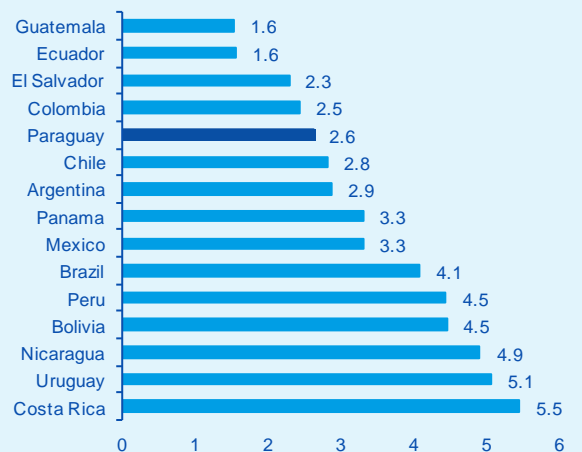
Accordingly, numerous studies have analysed the correlation between infrastructure investment and economic growth. Easterly and Rebelo (1993), using panel data from 24 countries, found that spending on transport and communications is positively correlated to economic growth<sup>9</sup>. Meanwhile, Calderon and Servén (2004), using data from 121 countries, highlight the fact that the level of infrastructure has an important and significant effect on economic growth in the long term, with robust results to changes in the infrastructure measures and estimation techniques used. They also note that both the quality and quantity of infrastructure contribute to lower levels of income inequality<sup>10</sup>.

Perroti and Sanchez (2011), meanwhile, show that Latin American countries needed to invest an average of 6.2% of GDP per year in infrastructure between 2012 and 2020 to close the gap between infrastructure demand and supply and to meet the needs of businesses and consumers<sup>11</sup>.

However, data from the region indicate that, in recent years, the amount of investment in infrastructure has fallen far below levels considered ideal to grow quickly and competitively. In fact, the lack of investment in infrastructure is a common denominator throughout the region. In 2012, the regional average for infrastructure spending was 3.42% of GDP. In particular, Paraguay allocated only 2.63% of GDP to improve its infrastructure, below the regional average (see Figure R.2.1).

Figure R.2.1

### LatAm: Investment in infrastructure (% of GDP)



Source: Cepal, World Economic Forum and BBVA Research

### International indicators on infrastructure in Paraguay

One of the most widespread indicators is the Global Competitiveness Index (GCI), which seeks to measure the performance of different countries in the task of ensuring the necessary conditions for sustainable economic progress. Data for the period 2015-2016 leaves Paraguay in ranked 118 out of the 140 countries assessed (just above Venezuela and Haiti in Latin America), and as regards to infrastructure, it is ranked in the same position. The latter is evidence that one of the main weaknesses of the country's competitiveness continues to be the lack of coverage of physical infrastructure. When analysing the indicators individually, we appreciate that the quality of roads and port infrastructure is what drags the country down, being ranked 138 and 110, respectively.

Similarly, a study by USAID (2006) finds that the main logistics costs come from the lack of dredging and buoys of rivers, the poor quality of the road infrastructure and delays in access to ports<sup>12</sup>. It should also be noted that during the recent period, no significant progress was

9 Easterly, W., Rebelo, S. (1993). Fiscal Policy and Economic Growth: An Empirical Investigation. *Journal of Monetary Economics*, 32, 417-58.

10 Calderón, C., Servén, L. (2004). The Effects of Infrastructure Development on Growth and Income Distribution. Policy Research Working Paper No. 3401.

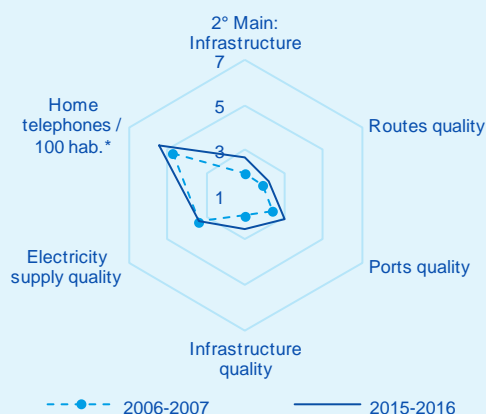
11 Perroti, D. and Sanchez, R., (2011). The infrastructure gap in Latin America and the Caribbean. Santiago, Chile. Series 153.

12 United States Agency for International Development [USAID] (2006). Impact of transport and logistics on Paraguay's international trade. Document prepared by CARANA Corporation, in collaboration with the National Chamber of Commerce and Services of Paraguay (CNCSP).

observed with regard to the quality of the electrical infrastructure (see Figure R.2.2).

Figure R.2.2

**Global Competitiveness Index, Pillar: Infrastructure**  
(Index between 1 “worst” and 7 “best”)



Source: World Economic Forum and BBVA Research

Another indicator that provides information about the state of the infrastructure of an economy is the Logistics Performance Index of the World Bank, which evaluates the perception of experts regarding logistics. According to this indicator, in comparison with the average for the region, the assessment remains quite unfavourable to Paraguay (see Table R.2.1).

Table R.2.1

**Paraguay: Logistical Performance Index**  
(Index)

	Paraguay		South America
	2007	2014	2014
<b>Logistical Performance Index</b>	<b>2.57</b>	<b>2.78</b>	<b>2.85</b>
Efficiency of customs clearance process	2.2	2.49	2.56
Quality of infrastructure related to trade and transport	2.47	2.46	2.68
Ease of agreeing to shipments at competitive prices	2.29	2.83	2.86
Quality of logistics services	2.63	2.76	2.81
Ability to track and trace shipments	2.67	2.89	2.91
Domestic logistics costs	3.13	n/d	n/d
Frequency with which shipments reach the consignee within the scheduled time	3.23	3.22	3.25

Source: World Bank and BBVA Research

All these factors indicate that Paraguay has a lot of room for growth in relation to the provision and improvement of economic infrastructure (which is

attractive considering that the economy has low levels of infrastructure and therefore a higher marginal productivity).

We anticipate that in the coming years the main driver of growth will be investment, especially infrastructure construction. This is important because it generates significant positive externalities and has a widespread direct impact on productivity levels. Ludeña and Ruiz Diaz (2008), for example, found that reducing transportation costs in Paraguay by 54% would contribute to an increase of 0.24% in GDP, to an increase in exports and imports (by 1.38 % and 6.35%, respectively) and an improvement of 3.88% in the terms of trade<sup>13</sup>.

While the Paraguayan government has been developing a series of reforms to improve the investment climate and create a better institutional framework for private sector participation in investment (including the Law on Public-Private Partnerships, PPP), there are crucial challenges ahead to reduce the gap in the existing infrastructure.

<sup>13</sup> Ludeña, C., Ruiz Diaz, F. (2008). Transport overruns: Geographical curse or infrastructure policy failure? An estimate for Paraguay from a general equilibrium model. Department of Economics, Faculty of Business Administration, Catholic University of Uruguay.

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