

Is Uruguay More Resilient This Time?

Distributional Impacts of a Crisis Similar to the 2001/02 Argentine Crisis

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Abstract

The 2001/02 Argentine crisis had a profound impact on Uruguay's economy. Uruguay's gross domestic product shrank by 17.5 percent and the proportion of people living below the poverty line doubled in just two years. It took almost 10 years for the poverty rate to recover to its pre-crisis level. This paper uses a macro-micro simulation technique to simulate the impact of a similar crisis on the current Uruguayan economy. The simulation exercise suggests that Uruguay would now be in a better place to weather such a severe crisis. The impact on poverty would

be considerably lower, inequality would not change significantly, and household incomes would be 8 percent lower than in the absence of a crisis (almost 9 percent lower for those households in the bottom 40 percent of the income distribution). Young individuals, female-headed households, those living in Montevideo, and those who do not have complete secondary education are more vulnerable to falling into poverty were the crisis to strike.

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1 Introduction

Uruguay has experienced remarkable growth and poverty reduction in the last decade and resolved many of the structural issues leading to the severe impact of the 2001/02 crisis. Debt management reform, improved banking regulations and better social safety nets as well as increased export diversification reduced the country's vulnerability. This could be seen during the 2008/09 financial crisis, which led to a significant, but short-lived drop in Gross Domestic Product (GDP), but did not cause a prolonged recession or significant increase in poverty numbers.

Despite considerable growth in recent years and macroeconomic stabilization, however, Uruguay remains exposed to several risks, internal and external. Internal challenges relate mainly to high inflation coupled with a slow-down in growth and a loss of competitiveness. The trade-off policy makers are facing is between further monetary tightening to bring inflation within the target range without excessively stifling the economy and maintaining the flexible exchange rate regime with an appreciating peso leading to a loss of competitiveness.

Besides the internal challenges, Uruguay is also exposed to shocks from the external environment. On the one hand, given Uruguay's dependence on Argentina and Brazil as the main trade partners, a hard landing in Argentina and lower growth in Brazil could have a significant negative impact on Uruguay's economy. On the other hand, the economy is exposed to changes in commodity prices and Foreign Direct Investment (FDI) inflows resulting from a potentially prolonged Euro Zone crisis.

The close ties with its neighboring countries and the exposure to their economies was felt during the Argentine crisis at the beginning of the last decade. Between 1999 and 2003, the Uruguayan economy shrank by 17.5 percent in real terms and household income dropped by over 20 percent (World Bank 2005). The crisis in Argentina led to capital flight, insolvent banks, depleted reserves, high sovereign debt and soaring inflation in Uruguay, and also caused a major decline in production and exports from Uruguay as well as a significant drop in private and government consumption. At the same time, moderate poverty in the country surged, climbing to close to 40 percent in 2003 and 2004 from only 15 percent in 1999.

The objective of this paper is therefore to assess the impact of a severe crisis similar to the Argentine crisis in 2001/02 on the current Uruguayan economy. The questions this analysis attempts to answer are the following: (i) given the significant reforms during the last decade, is Uruguay now better placed to weather a severe crisis, (ii) what will be the impact of such an event on poverty, shared prosperity and the overall income distribution, and (iii) given that a large share of the population has exited poverty in recent years, how vulnerable is this share of the population, how likely are they to fall back into poverty? As an alternative scenario, the paper also assesses the impact of a crisis similar to that of 2008/09, which was transmitted through different channels than during the 2001/02 crisis.

The paper is organized as follows: Section 2 introduces the methodology underlying the simulations carried out for this analysis. Section 3 outlines the country context, followed by a description of the

macroeconomic assumptions underlying the scenarios in Section 4. Section 5 presents the simulation results, and section 6 concludes.

2 Methodology

The micro-simulation model is based on a simplified version of the approaches developed by Bourguignon et al. (2008) and Ferreira et al. (2008). As outlined in Habib et al. (2010a, 2010b, 2010c), the method models the way macroeconomic shocks are transmitted to the labor market in the form of (i) loss of employment and labor earnings and (ii) loss of non-labor incomes in the form of international remittances. The micro-simulation combines macro-level information on the projected growth of output, employment, remittances, labor earnings, population, and prices with micro-level information on labor and non-labor income, labor force status, and basic job characteristics.¹

The micro-simulation model involves three basic steps: (i) benchmark, (ii) simulation, and (iii) assessment of the impact. The first step uses household -and individual- level information to model labor market behavior and the receipt of remittances. Labor force ‘status’ is divided into six categories² and is modeled as a function of household and individual characteristics. Parameters are estimated by means of a multinomial logit estimation as in Ferreira et al. (2008). Labor earnings for all employed individuals are then modeled as a function of individual and job characteristics and parameters are estimated by means of a Mincerian OLS regression. An assignment rule for remittances is then modeled, non-parametrically.

The second step simulates the process by which macro-level changes (projections of population growth, labor force status and earnings, and international remittances) are translated into changes in the labor market and into labor and non-labor income at the micro-level using the estimations obtained in the –baseline step. This simulation step is divided into four stages. First, demographic changes between the base year of 2011 and the year of the crisis are adjusted to replicate population growth projections. Second, aggregate flows between employment and unemployment as well as between sectors of employment are used to project labor force status and earnings at the micro-level using the multinomial logit and the Mincerian OLS estimations from the baseline step. Third, the assignment rule for remittances is followed to allocate aggregate changes in remittances at the micro-level. Fourth, minimal assumptions are used to simulate changes in other sources of non-labor income.

The model simulation relies on a series of assumptions in order to make microeconomic data consistent with macroeconomic projections, using behavioral estimations from pre-crisis household economic data to predict future economic outputs. In this sense, besides the obvious need for reliable macroeconomic data at the sector level, the model requires a series of assumptions to be

¹ A recent module of the ADePT software has been developed for micro-simulations: the “ADePT Simulation” module, which has been used for all the micro-simulations in this paper.

² The categories are inactive, unemployed and employment in the following four sectors: primary sector (agriculture, fishing, and mining), manufacturing (including electricity, gas, water and construction), commerce, tourism and transport, and lastly other services (financial and government services).

satisfied. The first one is that the structural relationships underlying the assignment of employment to each sector remain constant, that is the conditions that determine employment in a specific sector are not affected by the crisis. Additionally, the model assumes that the growth rates of labor income and profits are the same as the aggregate product rates for each sector, the factors of production are immobile; and price changes occur only between food and non-food.

The final step of the micro-simulation exercise is to assess the impact of a possible crisis by generating new income distributions. These distributions allow one to compare between the crisis and no-crisis scenario. This step includes adjusting the poverty line to account for changes in food prices, constructing measures of per-capita household income, and evaluating the poverty and distributional impact of the crisis using the distribution of income under both scenarios.

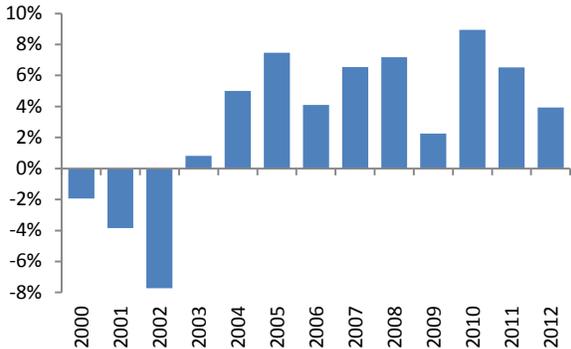
Household level data as well as macroeconomic data are needed. The major data needs for the exercise are, at the household level, labor force surveys with detailed information on the distribution of the working age population by sector and economic status as well as earnings. At the macro level, ideally, good projections for the key macro variables under the two scenarios (benchmark and post crisis/post policy reform) are needed (projections on population growth, labor market composition and earnings, and international remittances).

3 Country context

3.1 Macroeconomic developments

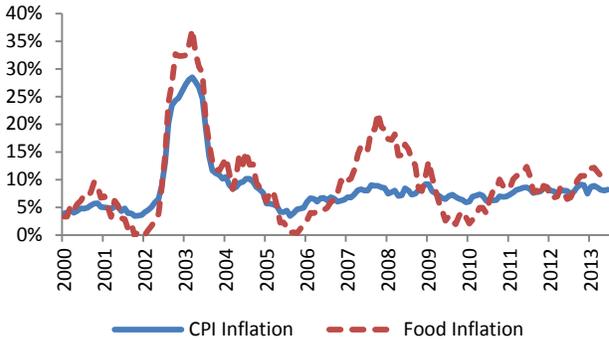
Uruguay was hit hard by the 2001/02 Argentinean crisis, but recorded a strong macroeconomic performance over the following years. Uruguay’s economy experienced a deep recession with negative growth rates of real GDP of up to 7.7 percent in 2002, high inflation and significant debt accumulation. Following the crisis, however, the economy recovered and real GDP growth averaged more than 5 percent per year since 2003, marking one of the longest growth periods in the country’s history. Prudent macroeconomic policies, improvements in structural areas and favorable external economic conditions, such as buoyant demand for main export products and a booming regional economy, have contributed to the strong economic performance of Uruguay and helped protect the economy during the 2008/2009 crisis.

Figure 1: Real GDP growth rates, 2000-2012



Source: BCU

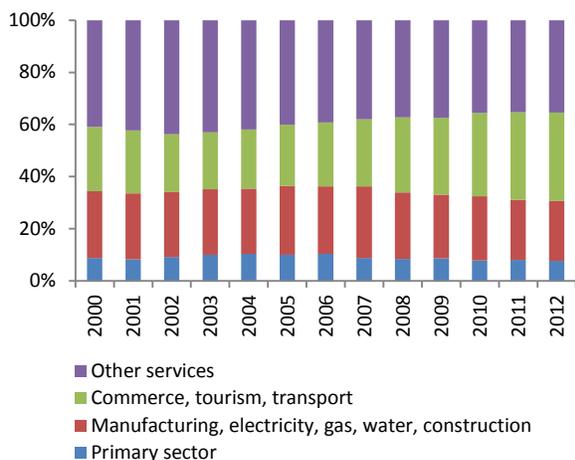
Figure 2: CPI, food price inflation (yoy), 2000-2012



Source: INE

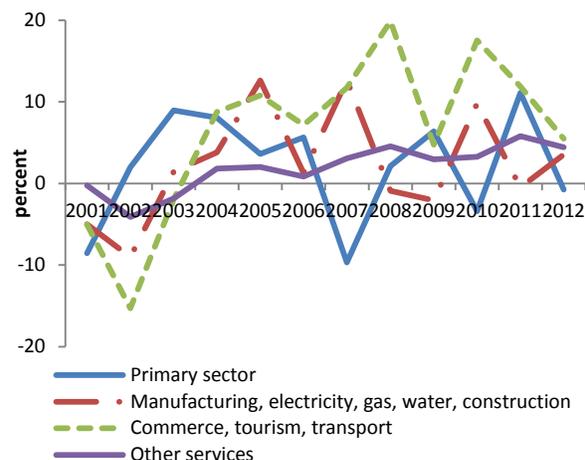
Commerce, tourism and transport have been the fastest growing sectors in the past 10 years, while the share of the primary sector declined. However, during the Argentina crisis, commerce, tourism and transport were also the sectors that grew the least. The primary sector, on the other hand is more vulnerable to adverse climatic conditions and commodity price shocks. On the demand side, private consumption continues to be the main driver of the economy.

Figure 3: Sectoral shares of real GDP, 2000-2012



Source: BCU

Figure 4: Real sectoral growth rates, 2001-2012



Source: BCU

However, despite these positive developments, significant risks remain. The economy remains vulnerable to shocks related to Uruguay's trade dependence on Argentina and Brazil. While Uruguay has diversified its export markets and reduced export concentration, merchandise exports continue to be concentrated in primary products and the five main trading partners concentrate 50 percent of total merchandise exports. Brazil is still the country's main trading partner with 19.9 percent of total merchandise exports in 2012, while Argentina is in the fourth place with 5.7 percent of total merchandise exports. A hard landing in Argentina and lower growth in Brazil could have a significant negative impact on Uruguay's economy.

A possible worsening of the Euro Zone crisis and a prolonged economic downturn in developed countries would likely have negative effects on Uruguay. A potential global economic slowdown would affect Uruguay via similar channels as during the 2008/2009 crisis, namely: lower external demand and a drop in commodity prices, lower FDI inflows and heightened risk aversion of investors leading to a reduction in short-term private portfolio inflows, loss of access to global financial markets leading to difficulties in securing financing and increased liquidity risks; and lower fiscal revenues due to reduced economic activity and higher expenditure due to counter-cyclical stimulus. An analysis carried out in 2012, estimated real growth in Uruguay to fall by about 1.7 percentage points under a mild crisis scenario and almost 5 percentage points in the case of a global recession (World Bank 2012).

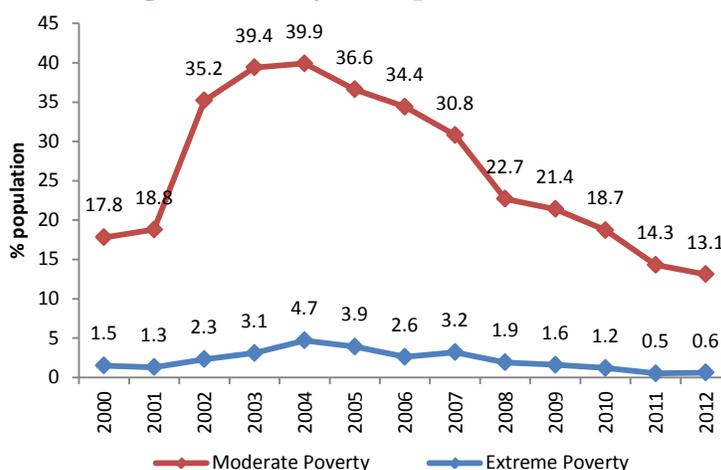
In addition, inflationary pressures continue to be a recurring problem for the economy. Although prices were successfully stabilized in the 1990s, strong inflationary pressures, including rising

international commodity prices and strong internal demand and supply restrictions for certain goods, led to an increase in the average CPI inflation from 4.7 percent in 2005, the lowest inflation rate after the crisis, to 8.1 percent in 2012, considerably over the target range set by the monetary authority (4 to 6 percent). Since the beginning of 2011, the Central Bank therefore repeatedly increased the monetary policy rate up to 9.3 percent in December 2012 to curb inflation and to help realign inflation expectations with the official inflation target range.

3.2 Poverty, shared prosperity, labor market and demographics

The economic crisis of the early 2000s had negative impacts on the welfare of the population that lasted several years. Uruguay had traditionally been among the LAC countries with the lowest poverty and inequality incidence³ (Lopez-Calva and Lustig, 2010; Gasparini et al., 2011), but the effects of the crisis significantly and negatively affected most social indicators, including poverty, inequality, unemployment, labor informality and economic mobility. Moderate poverty almost doubled in one year – from 18.8 in 2001 to 35.2 percent in 2002 – and reached 40 percent of the population in 2004 (Figure 5). At the same time, the size of the middle class shrunk from over half of the population to less than three fifth (World Bank, 2013). Most of these indicators began to recover only after 2004, once the economic recovery was well under way and new social policies had been implemented.⁴

Figure 5: Poverty developments, 2000-2012



Source: INE; *Note:* For comparability across time, all numbers in the figure are representative of urban areas (more than 5,000 inhabitants), since ECH became representative at the national level only after 2006.

Poverty and extreme poverty incidence showed a fast growth trend in the early 2000s, and a decline that started after 2004 (Figure 5). The upward trend in poverty rates observed in the early 2000s reverted between 2004 and 2005, first at a slow pace and, in recent years, more rapidly. By 2012 only 12.4 percent of the population was living with a per capita income below the poverty line, about

³ Estimates of poverty in Latin America using SEDLAC (CEDLAS and The World Bank).

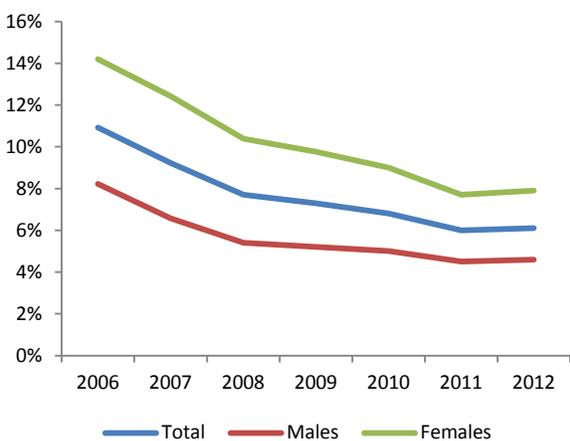
⁴ See Annex 1 for more detail on the data and sources of information.

one-third of the rate seven years earlier. The reduction in extreme poverty was even more dramatic in relative terms, as the rate dropped to around 0.5 percent, less than one-sixth of where it stood seven years earlier.

The observed poverty reduction after 2003-04 was accompanied by strong income growth of the bottom 40 percent of the population, the World Bank’s indicator of shared prosperity. Between 2003 and 2011, using the official income aggregate, the real per capita income of the bottom 40 percent grew by more than seven percent annually, while mean income growth was less than six percent. In particular, during the first part of the decade, 2003 to 2008, real income per capita of the bottom 40 percent grew at an annualized rate of 7 percent, while the mean income growth rate was about 6.1 percent. During the second half of the decade, from 2008 to 2011, the less well off in Uruguay benefitted more from growth than the average person by even more, with real income per capita of the bottom 40 percent growing at 7.7 percent, while the mean growth rate was about 5.1 percent. This trend coincides with the expansion of safety nets during the second part of the decade.

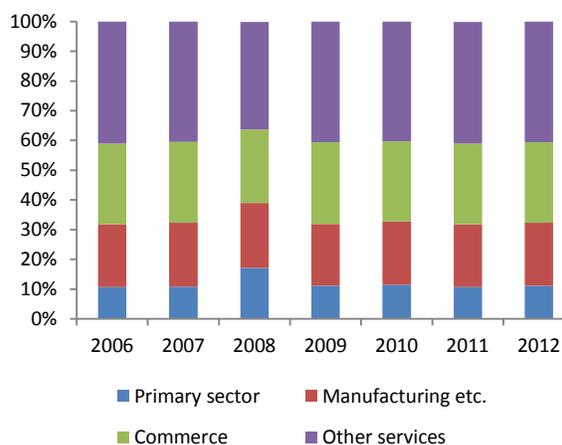
Labor market trends have been similar to poverty trends, as labor income is the main component of household income. Unemployment grew during most of the 1990s, reaching a maximum level of 16.9 percent of the labor force in 2002. This problem was compounded by the fact that, among those who managed to retain employment during the crisis, labor informality (defined as jobs with no social security protection) also increased, from just below 40 percent in the early 1990s to a maximum of 42.7 percent in 2004. The situation began to improve significantly only after 2004. Unemployment fell rapidly and averaged 6.1 percent in 2012, slightly higher than that of 2011 (6.0 percent), while informality also declined as a consequence of better macroeconomic conditions and enhanced enforcement of social security collection.

Figure 6: Unemployment rates, 2006-2012



Source: INE

Figure 7: Sectoral employment shares, 2006-2012



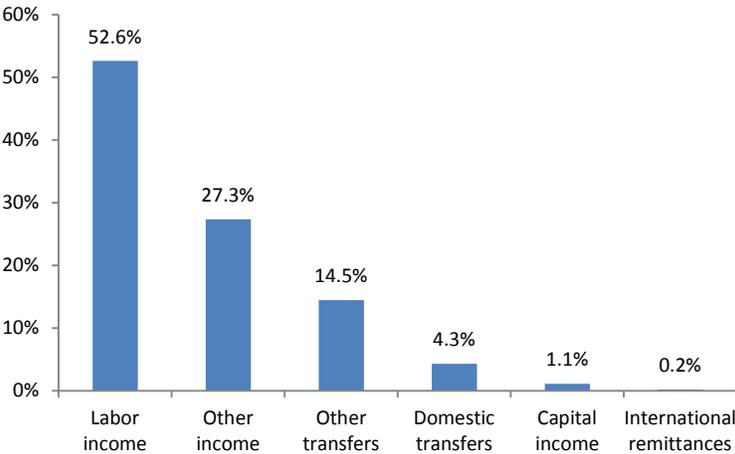
Source: INE

Despite the significant progress in poverty reduction, shared prosperity and upward economic mobility in recent years, a sizable segment of the population is still at risk of falling into poverty or dropping from the middle class. Estimates of income mobility between 2004 and 2011 suggest that the majority of those who exited poverty were near the poverty line in 2004 and find themselves just above the poverty line in 2011 with a median income around US\$5 PPP per day (World Bank, 2013). Very few of these households crossed the middle class threshold. Similarly, most of those who did enter the middle class in this period were already near the middle class line in 2004. Having entered the middle class by 2011, they have a median income close to US\$13 PPP per day, barely over the middle class line.

In sum, most of households that exited poverty in Uruguay in recent years have experienced only a modest improvement in welfare that did not allow them to move into the middle class and thus have high risk of falling back into poverty. Thus an additional challenge for the government is to identify this segment of the population and adequately protect it against potential negative shocks.

In the simulation, welfare changes are influenced mostly through the labor market and remittances. Even though labor income is the main component of total income, accounting for 52 percent, other income and other transfers account for 42 percent of the total household income. These two components, which include, among others, pensions and health insurance payments, are of particular importance in the simulations since they are government transfers that are a stable source of income that is kept constant during the simulation of an economic crisis. Therefore, the ability of the model to predict household welfare changes is limited to the labor market and remittances channel. Along these lines, the results of the model can be seen as a bound which the government can augment by taking action using the automatic stabilizers such as unemployment insurance and increasing social safety nets during the time of crisis.

Figure 8: Average income composition 2011



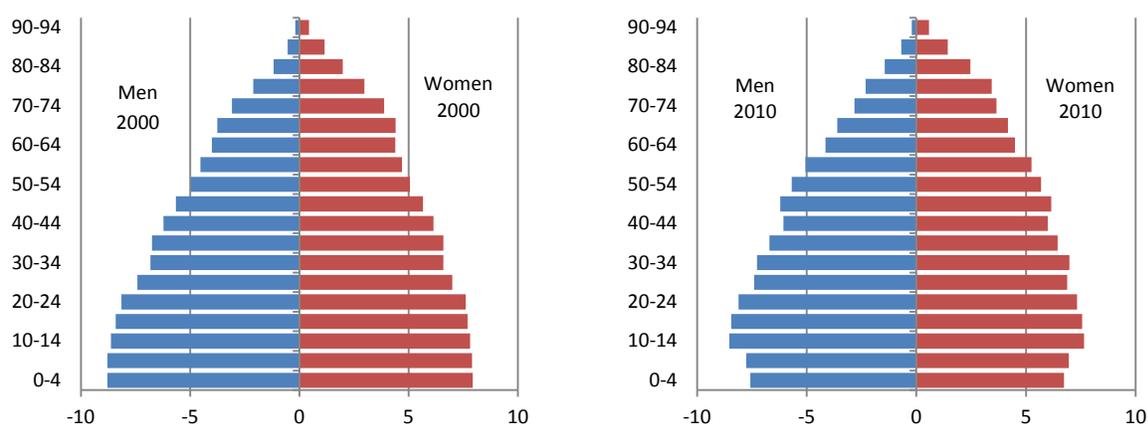
Source: WB staff calculations based on ECH 2011.

Note: Sample representative at the national level.

Including Montevideo, and urban and rural areas of the Interior region

The demographic structure of Uruguay has changed significantly in the past decade and Uruguay's aging process is the most advanced in the LAC region. Uruguay's population in 2010 is estimated at 3.4 million. A comparison between 2000 and 2010 shows that the demographic pyramid has narrowed in the infant population segment (under age 10) and widened significantly in the population segment corresponding to age 30 and up. Uruguay's population is aging, with a high percentage in the middle population segment. Uruguay has the oldest population in LAC, followed by Argentina and Chile (Cotlear, 2011). Uruguay also has a low fertility rate, which with 2.1 children is just at the replacement rate.

Figure 9: Demographic structure of Uruguay, 2000 and 2010



Source: INE

4 Macroeconomic projections

Two main scenarios are considered for this analysis. While the benchmark scenario assumes 'business as usual' without major disruptions to economic development, the crisis scenario simulates a situation similar to that during the Argentine crisis in 2001/02. Projections for the benchmark/no-crisis scenario are formulated based on forecasts from the Ministry of Economy and Finance, local consultancy companies as well as internal World Bank models. The crisis scenario is mainly based on developments during the crisis a decade ago, assuming external shocks hitting the economy leading to negative real growth and double digit inflation. GDP as well as employment shares are divided into the following four sectors: (i) primary sector, including agriculture, fishing and mining; (ii) manufacturing, including gas, water, electricity and construction; (iii) commerce, tourism and transport; and (iv) other services, including financial and real estate services, public administration, health and education. In addition, an alternative crisis scenario has been formulated that assumes conditions similar to the 2008/09 crisis, which is presented briefly in section 5. The scenarios are developed for two consecutive years, which will be identified as year 1 and year 2 in the remainder of the document.

4.1 GDP, inflation and remittances

Growth is expected to be moderate over the medium term for both scenarios (Table 1). Sustained, but lower growth is projected due to the more challenging international economic environment and the expected return to the estimated potential growth rate. Internal demand is projected to remain the key driver of economic growth, mainly explained by private consumption. Investment is expected to remain strong, supported by large FDI inflows. As in previous years, net exports are projected to contribute negatively to growth, especially during year 1. CPI inflation is expected to start declining in year 1, mainly due to the projected deceleration of economic activity, and to gradually approach the monetary authority's target range of 4 to 6 percent thereafter.

Under the benchmark scenario, therefore, a real GDP growth rate of 4.0 percent is assumed for year 1 and 2, close to the estimated potential GDP growth. Commerce, tourism and transport are expected to follow a similar trend as the past years, although somewhat slower, and to expand at the fastest rate among sectors, while the primary sector experiences slower growth rates. In line with a slowdown of the economy, overall inflation is expected to decline to 7.1 percent in year 1 and to 6.1 percent in year 2. Food inflation will similarly decline to 6.5 percent in year 1 and 6.4 percent in year 2.

Under a more pessimistic crisis scenario, however, a recession similar to that experienced in 2001/02 is assumed with a contraction of real GDP by 7.7 percent in year 1, followed by a faster recovery than during the Argentine crisis with an increase in real GDP of 0.8 percent in year 2. A particularly sharp decline is assumed for manufacturing and commerce, tourism and transport, which are more immediately affected by the downturn. Overall inflation is projected to follow a similar trend to 2001/02 as well, peaking at 13.9 percent in year 1 and declining to 9.2 percent in year 2.

Table 1: Projections of GDP growth rate and inflation under the benchmark and crisis scenario, year 1 - year 2 (all in percent)

	GDP			CPI			Food CPI		
	Benchmark	Crisis	Difference	Benchmark	Crisis	Difference	Benchmark	Crisis	Difference
2011	6.5	6.5	-	8.1	8.1	-	9.6	9.6	-
baseline year (2012)	3.9	3.9	-	8.1	8.1	-	8.4	8.4	-
year 1	4.0	-7.7	-11.7	7.1	13.9	6.8	6.5	7.0	0.5
year 2	4.0	0.8	-3.2	6.1	9.2	3.1	6.4	6.7	0.3

Source: BCU, INE and WB staff calculations; GDP = GDP at factor cost; 2011 and 2012 are actual data.

Remittances have not played an important role in the Uruguayan economy so far. Compared to other Latin American countries, remittances have not been a major contributor to the Uruguayan economy, representing less than 1 percent of GDP, reaching about USD120 million in 2012. Similar trajectories have therefore been assumed for remittances for year 1 and year 2, following the past trend, with slightly lower values for the crisis scenario.

4.2 Population and labor market

Uruguay's population is not expected to change substantially during year 1 and year 2. Projections have been obtained from the National Institute for Statistics and reflect an increase of only 1.4 percent or 38,000 people between the baseline year (2012) and year 2.

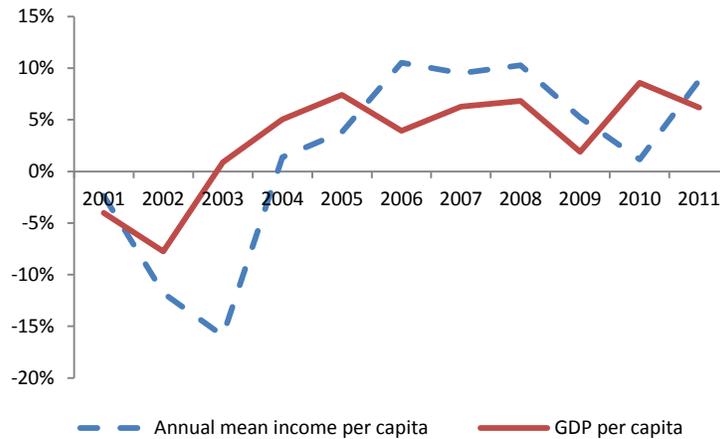
The adjustment of the labor market to past output changes is used to project future adjustments. To assess the household level adjustment to changes in the labor market on the macroeconomic level, it is assumed that changes in labor market conditions are proportional to changes in output, based on the estimated past relationship between output and employment, requiring the specification of sectoral and total output-employment elasticities. The elasticities are calculated using the past GDP and employment changes for each sector as the percentage change in employment in the sector between years $t-1$ and t in response to a 1 percent change in sector output for the same period. The calculated parameters have fluctuated quite substantially over the last five years, especially during the 2008/09 crisis, leading to the omission of 2008 and 2009 in their calculation under the no-crisis scenario, but have settled down more over the period 2010-2011.

Employment shares are not expected to change drastically. Under the benchmark scenario, sectoral employment shares will stay basically unchanged with a small shift from manufacturing to commerce, tourism and transport, which are expected to grow at the fastest rate. In the crisis scenario, based on the assumed output response in the respective sectors, the decline in the employment share of commerce, tourism and transport as well as that of other services will be more pronounced.

4.3 Interaction of micro and macro data

As explained in section 2, one of the key assumptions of the simulation is that microeconomic variables when faced with economic crisis do not change their behavior and the growth rates of labor income and profits are the same as the aggregate product rates for each sector. In order to validate the assumption that microeconomic data follows macroeconomic fundamentals, Figure 10 shows the real growth rate between GDP per capita and the per capita official mean income from the available household surveys. As can be seen, in general terms the mean income per capita follows GDP per capita. However, the movements of mean per capita income tend to lag and overreact vis-a-vis the movements in GDP per capita. This behavior does not violate the assumptions needed for the correct implementation of the model, but show that reactions to macroeconomic shock can be seen one period later than expected.

Figure 10: Macro and micro mean income historical comparison – growth rate



Source: WB staff calculations based on data from BCU and ECH.

Note: For comparability across time, all numbers in the figure are representative of urban areas (more than 5,000 inhabitants), since ECH became representative at the national level only after 2006.

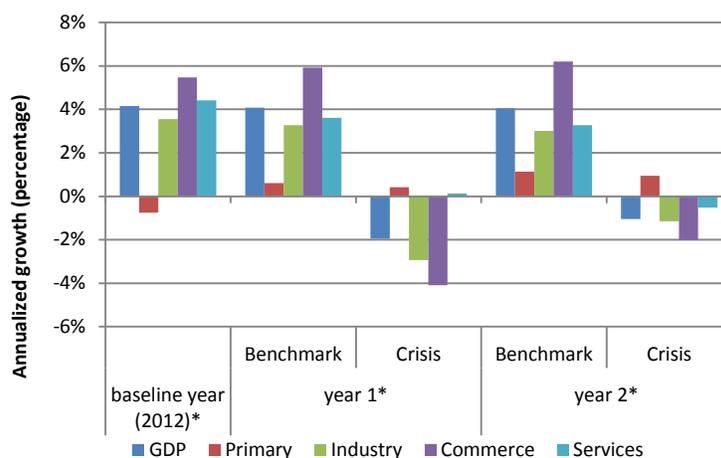
5 Simulation results

Two micro simulations were constructed for each year in order to compare the results on poverty, shared prosperity and the overall income distribution between the benchmark/no-crisis and crises scenarios. The simulation parameters as well as the results of the simulation are presented in the following sections.

5.1 Simulation parameters

The simulations are based on the comparison of benchmark to crisis scenario. The scenarios developed for the baseline year (2012), year 1 and year 2 were then mapped to the 2011 household survey *Encuesta Continua de Hogares* released by INE. The macroeconomic parameters used in the simulations are presented in Figure 9. They represent the percentage change of each indicator from its level in 2011. In year 1, under the benchmark scenario, annualized real GDP growth is 4.1 percent higher than in 2011 whereas under the crisis scenario, it is 2.0 percent lower. Moreover, different sectorial growth rates are simulated for each of the scenarios, which explain the dissimilarities in the unemployment rate. For year 2, under the crisis scenario, GDP is expected to contract by 1.0 percent (annualized growth rate) with respect to the 2011 levels, while under the no-crisis scenario real GDP would be 4.0 percent higher, in annual terms, than it was in 2011.

Figure 11: Benchmark and crisis projection: GDP growth from 2011, annualized growth

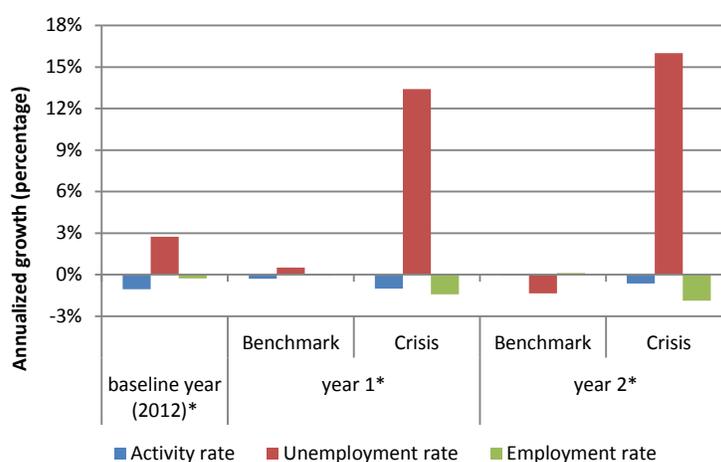


Source: WB staff calculations based on data from BCU and ECH 2011.

*Change with respect to 2011

Similar to the 2001/02 crisis, under the crisis scenario, all the sectors are expected to be affected negatively with the exception of the primary sector. The resulting annualized unemployment rate would be 13.4 percent higher than the rate in 2011 due mainly to the contraction of the industry and commerce sectors that in 2011 represented 21 and 27 percent of the employed population, respectively⁵. In the absence of a crisis, activity, employment and unemployment rates are not expected to change significantly in the first year, but by year 2 the unemployment rate is predicted to decrease at an annual rate of over 1 percent.

Figure 12: Benchmark and crisis projection: labor growth from 2011, annualized growth



Source: WB staff calculations based on data from ECH 2011

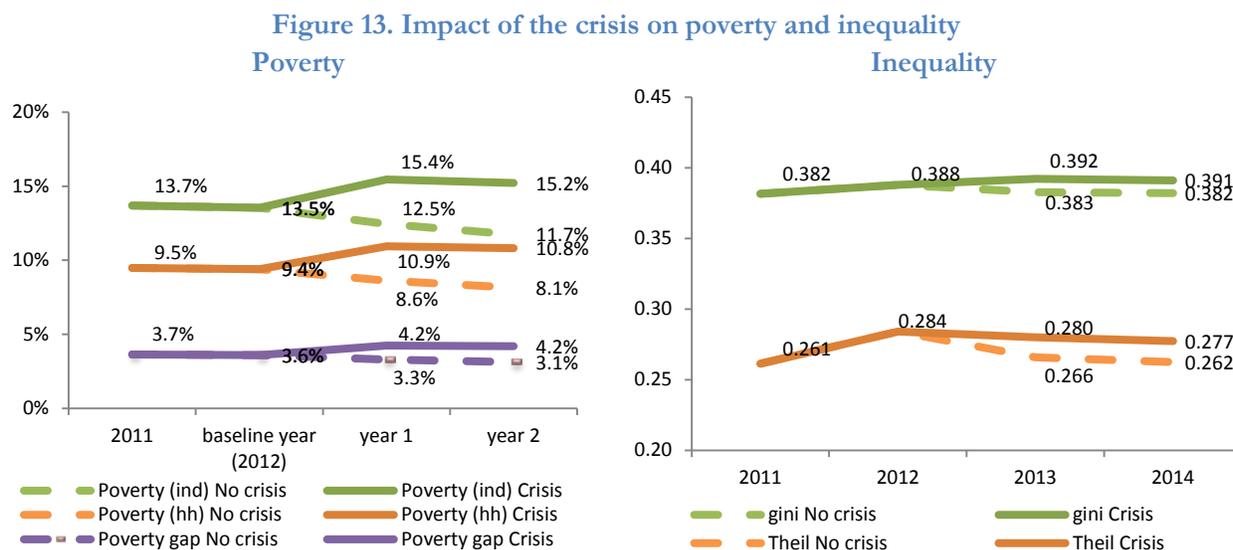
*Change with respect to 2011

⁵ Own calculations using 2011 *Encuesta Continua de Hogares*.

5.2 The impact on poverty, inequality and shared prosperity

Figures 13a and 13b present the results of the micro-simulations on poverty and inequality. Figure 13a shows the levels of moderate poverty at the individual and household level and the poverty gap (Foster-Greer-Thorbecke - FGT1), while Figure 13b shows the Gini and Theil coefficients.

As expected, the level and depth of poverty is higher in the crisis scenario. In the benchmark scenario, poverty declines from 13.7 in 2011 to 11.7 percent in year 2. On the other hand, if a crisis were to strike poverty is predicted to increase to levels of 15.4 and 15.2 in year 1 and year 2, respectively. This increase represents an average a poverty rate that is 3.5 percentage points higher than it would have been in the absence of the simulated macroeconomic shocks and 1.5 percent higher than the poverty levels in 2011. An important results is that under the crisis scenarios not only more people live under the poverty line, but the depth of poverty, measured by the FGT1, increases as well, implying that more resources would be needed in order to assist the poor population.



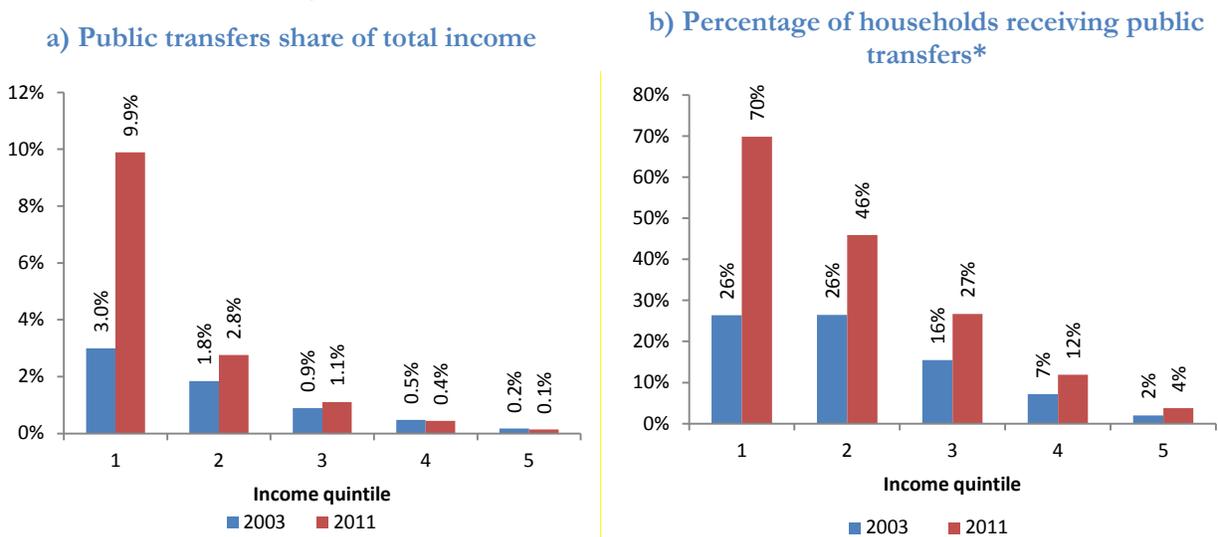
Source: WB staff calculations based on data from ECH 2011

The impact on poverty, however, would be less severe than during the 2001/02 Argentine crisis. At this stage, it is worth putting the results of the predictions in context. While any increase in the proportion of poor people should warrant attention, it is equally important to contrast the 3.5 percentage point expected increase with the 20 points spike observed after the 2001/02 Argentine crisis. There are certainly various factors that might be explaining these results, notably the increasing role of social transfers and other non-labor incomes in family's incomes relative to the beginning of the decade.

In the past years, the non-contributory components of the Uruguayan social protection system have been expanded considerably. The implementation of the “*Plan de Atención a la Emergencia Social*” (2005), later replaced by “*Asignaciones Familiares-Plan de Equidad*” (2008), and the “*Tarjeta Uruguay*”

Social” (2006) extended social benefits to the lowest-income population. The implementation of new social programs is reflected in an increasing share of transfers⁶ in households’ total income. In particular, transfers represented 3 percent of the total household income in 2003 while in 2011 they represented almost 10 percent⁷ (Figure 14a). Additionally, coverage of public transfers also increased from 26 percent of households in the first quintile in 2003 to 70 percent in 2011⁸ (Figure 14b). Rofman (2013) also shows that social transfers are a very important part of household income for households in the first decile of the income distribution and estimates that non-contributory transfers led to a reduction of 10 percent in poverty incidence, 16 percent in poverty intensity and 23 percent in poverty severity. He also analyzes the vulnerability of households and shows that the combination of a rise in unemployment to 2002 levels and a 10 percent reduction in real household income would increase the poverty rate to 26.8 percent, if the current transfers system remains in place, and to 32.2 percent if the prevailing system was that of 2002 highlighting the importance of social transfers.

Figure 14. Evolution of public transfers, 2003 and 2011



Source: WB staff calculations based on data from ECH 2011 and 2003

Note: For comparability across time, all numbers in the figure are representative of urban areas (more than 5,000 inhabitants), since ECH became representative at the national level only after 2006.

* Does not include non-contributory pensions

The change in poverty can be better understood by analyzing the impact on the labor market and the different sources of income. Even though the unemployment rate tends to remain around 6 percent over the benchmark scenario and there are no important changes in the proportion of the inactive population, under the crisis scenario, unemployment is 1.4 percentage points higher in year

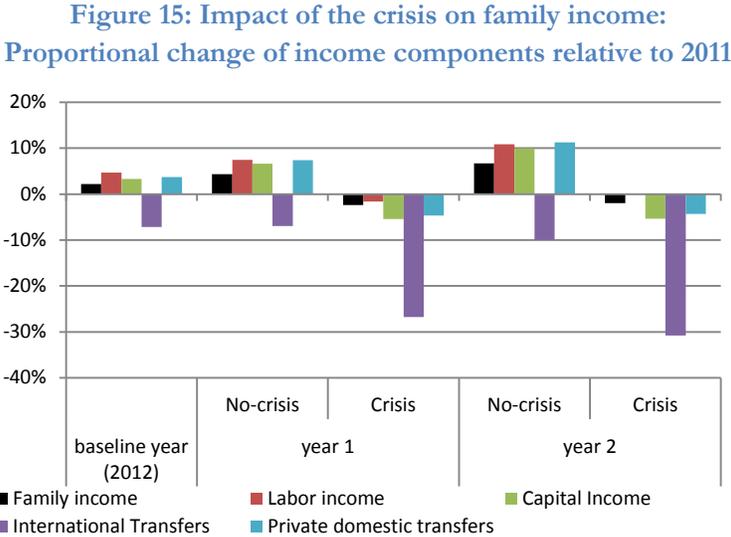
⁶ Includes government transfers different than non-contributory pensions. Specifically, the programs included are: unemployment insurance, *Hogar consituído* and *Asignaciones Familiares*.

⁷ In this period, the mean transfer per capita in the first quintile increased from 44.36 to 293 Uruguayan pesos per month. (values in 2005 Montevideo’s prices)

⁸ In the case of *Asignaciones Familiares*, administrative data shows that it increased its coverage in 36 percent between 2003 and 2011 passing from 402,672 to 549,295 beneficiaries during this period. (Banco de Previsión Social 2011)

1 and 3.3 percentage points higher in year 2 compared to the figures estimated under the no-crisis scenario. As a consequence, the average family income in the crisis scenario in year 1 and year 2 is 6.4 and 8.1 percent lower vis-à-vis the benchmark scenarios (Figure 15). At the same time, when compared with 2011, in the absence of a crisis, the average family per capita income in year 1 and year 2, respectively, would be 4.3 and 6.7 percent higher.

Disaggregating family income into its components, under the crisis scenario, the largest falls are observed in capital income, international transfers and private domestic transfers. Yet, since only a relatively small proportion of households have these income sources,⁹ the main source of the change in per capita family income is the reduction in labor market income. For year 2, under the crisis scenario, labor income would be 9.7 percent lower than predicted under the absence of a crisis and 0.1 percent lower when compared to the 2011 mean labor income. This means that the main effect of the crisis is in terms of labor incomes lost because of the unfavorable macroeconomic shock that would have hit the economy¹⁰.



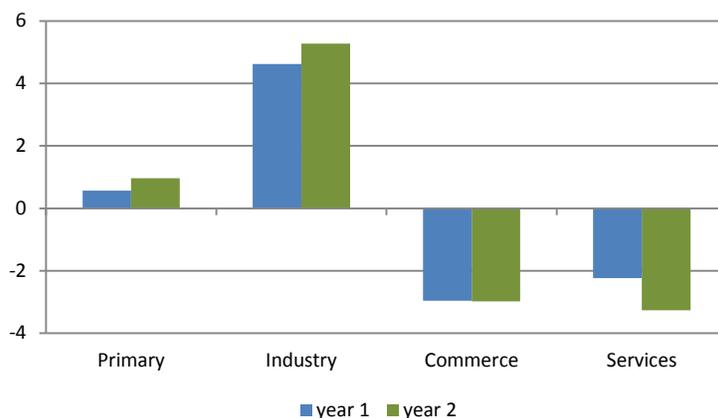
Source: WB staff calculations based on data from BCU and ECH 2011

In terms of the impact of the crisis on employment by sector, relative to the absence of crisis, the simulation predicts lower shares of employment in the commerce and services sector. The flipside of this is that the share of the active population employed by industry is higher than in the no-crisis scenario, even though this sector would be largely affected by the crisis in terms of GDP (see Figure 16). Meanwhile, the primary sector experiences no major changes under the crisis scenario relative to the benchmark.

⁹ According to 2011 *Encuesta Continua de Hogares*, capital transfers are received by 8.4 percent of Uruguayan households, international transfers by 1.8 percent and private domestic transfers by 26 percent of households. In the case of public transfers, by 2011 they represented on average 18 percent of households per capita income.

¹⁰ It is important to note that the model keeps constant at the pre-shock level income coming from social benefits, pensions and other transfers as explained in section 2. Since these components are very important in the total income aggregate in Uruguay, the ability of the model to explain the total income change may be limited. Please see Annex 2 for further explanation on the validation exercise.

Figure 16: Sectoral employment shares: Benchmark versus crisis scenario (percentage change)

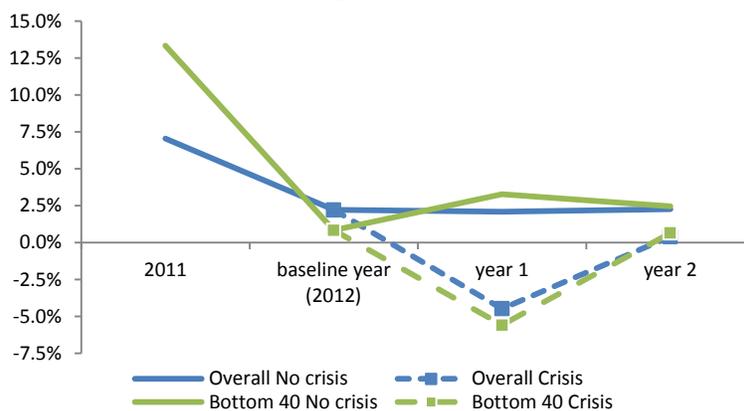


Source: WB staff calculations based on data from BCU and INE

A crisis would significantly reduce the income growth of the bottom 40 percent with respect to both the benchmark and the growth rate of the mean income. In particular, the indicator of shared prosperity in Uruguay would decline from 13.3 percent between 2010-11 to 0.8 percent between 2011-12 and become negative between the baseline year and year 1 at -5.6 percent and showing a slightly recovery for year 1-year 2 with a growth rate of 0.7 percent (Figure 17). For the baseline year and year 1, the growth of the bottom 40 percent will be lower than the growth of the mean, which may translate into an increase in inequality, while for year 1-year 2, these two growth rates will be just above zero.

Similar to the poverty rates, the impact of a crisis on shared prosperity would be less severe than the 2001/02 economic shock. Back in the years 2001 to 2003, the Argentine crisis produced income growth rates of the bottom 40 percent of -5.2 and -16.9 percent, respectively; while the growth rate of the mean income was -3.3 and -19.0 percent. A simulated crisis for the baseline year to year 2 would also have negative consequences on shared prosperity but not as severe in magnitude as of those of the 2001/2 Argentine crisis.

Figure 17: Impact of the crisis on Shared Prosperity (growth of the incomes of the bottom 40 percent)

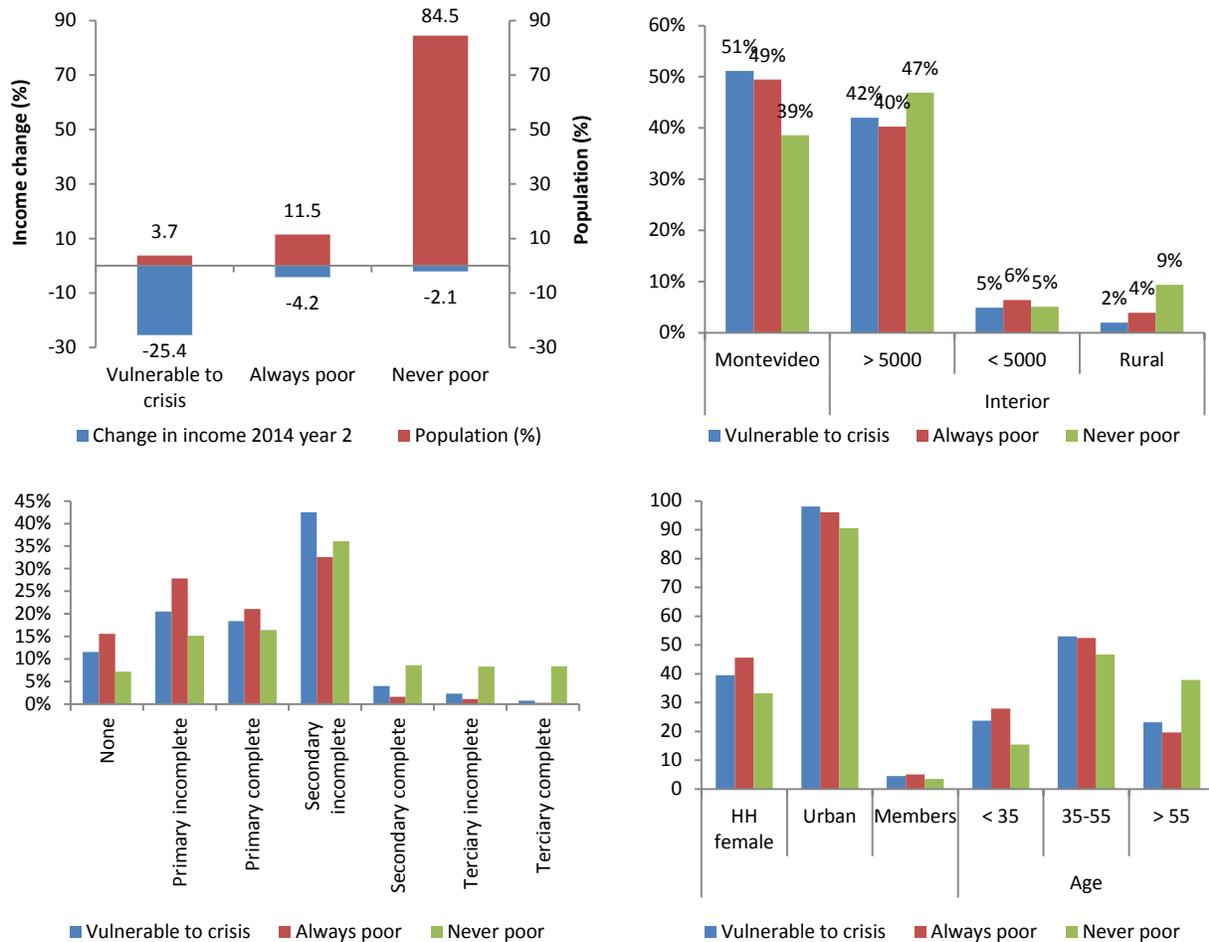


Source: WB staff calculations based on data from BCU and ECH 2011

5.3 Heterogeneous effects of the crisis

In order to better understand the distributional implications of a possible crisis, Figure 18 shows descriptive statistics for Uruguayan households grouped by their poverty trajectories under the crisis scenario relative to the no crisis scenario, evaluated in year 2. We distinguish three types of households: “always poor” (those that fall below the poverty line with and without crisis), “never poor” (those above the poverty line in both scenarios) and “vulnerable to crisis” (those that would not be considered poor in the absence of crisis but are predicted to be so were the shock to hit Uruguay as simulated).¹¹

**Figure 18: Households in the crisis scenario in year 2
(composition, residence, educational level and other characteristics)**



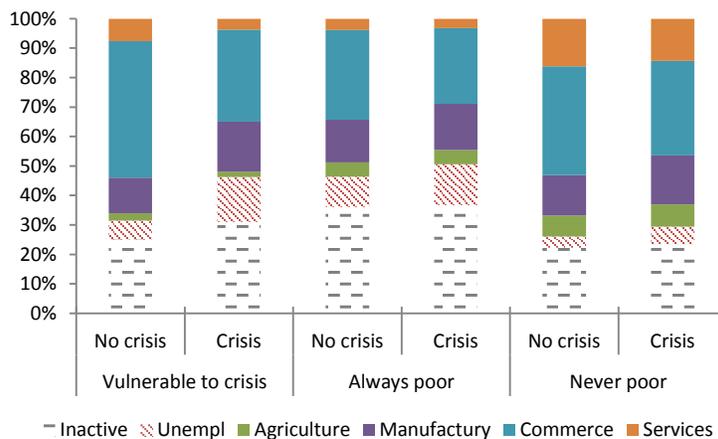
Source: WB staff calculations based on data from ECH 2011. Status is evaluated according to simulations for year 2: “Always poor” (poor with and without crisis), “never poor” (non-poor in both scenarios) and “vulnerable to crisis” (poor with crisis and non-poor without crisis)

¹¹ There is, of course, a fourth group: those who would be poor in the absence of crisis but would be above the poverty line were the crisis to strike. Since there is a negligible proportion of individuals in this group, for clarity of exposition it is ignored in the figures.

According to the simulation, 3.7 percent of the total population is vulnerable to fall into poverty in the presence of a crisis. This group would on average have a per capita household income almost 30 percent lower than in the absence of a crisis. The other groups would also experience a lower income but the magnitude of the income change is much lower.

Three interesting patterns emerge. First, households that are “always poor” (i.e., poor in year 2 under both scenarios) have a higher incidence of female headship and higher number of members than in the rest of the population. The same is true for those households that would fall into poverty were the crisis to occur. Second, the proportion of “always poor” and “vulnerable to crisis” households in rural areas is lower than the proportion of households categorized as “never poor”. Finally, families that are “vulnerable to crisis” seem to have not only higher unemployment rates than in the no-crisis scenario but also a higher proportion of people out of the labor forces altogether. Relative to the benchmark, those that would cease to work come from the commerce and services sectors (Figure 19).

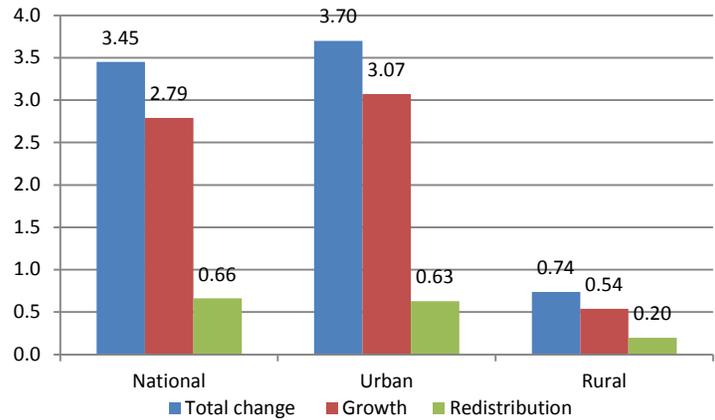
Figure 19: Changes in the labor market



Source: WB staff calculations based on data from ECH 2011. Status is evaluated according to simulations for year 2: “Always poor” (poor with and without crisis), “never poor” (non-poor in both scenarios) and “vulnerable to crisis” (poor with crisis and non-poor without crisis)

The decrease in the growth rate is the main contributor to higher poverty rates in the case of the simulated crisis relative to the absence of the shock. Following Datt and Ravallion (1992), increments in moderate poverty can be decomposed into those that are due to changes in the income level (growth) and changes in the income distribution (redistribution). Figure 20 presents the decomposition into these two components at the national, urban and rural areas comparing the year 2 benchmark (no crisis) and crisis scenarios. The lack of growth is the main driver of the poverty increments in both urban and rural areas, and thus at the national level. However, as the figure shows, taking into account *only* the effect of negative growth would understate the rise on moderate poverty levels since the increased inequality of the income distribution plays an important role in explaining the predicted increment of poverty rates.

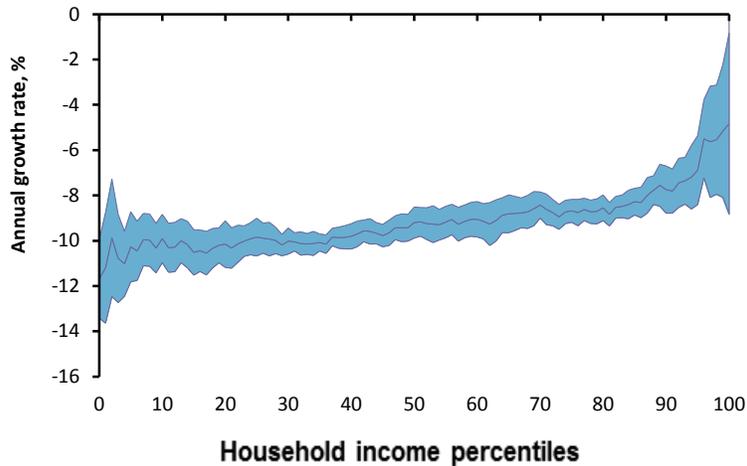
Figure 20: Datt-Ravallion decomposition: Benchmark vs. crisis scenario (% change)



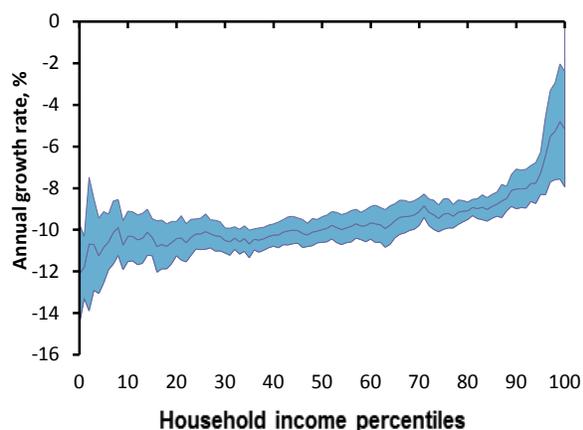
Source: WB staff calculations based on data from ECH 2011

The results of the Datt-Ravallion decomposition are consistent with the Growth Incidence Curves – GIC – (Figures 21 and 22a and 22b). These figures show, for each percentile, the net income change of the year 2 crisis scenario relative to the benchmark. In all three areas, the mean growth rate (that is, the average growth rates across percentiles) is negative, between -2 percent and -14 percent. In rural areas, the effect of a crisis would be more evenly distributed among the different income percentiles.

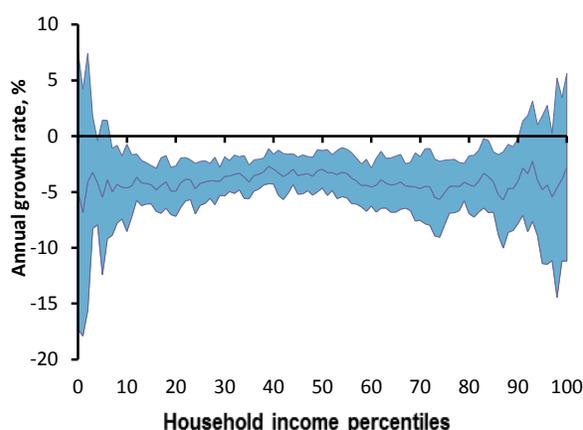
Figure 21: Growth incidence curve: Benchmark vs. crisis scenario in year 2



**Figure 22a: Growth incidence curve (urban):
Benchmark vs. crisis scenario in year 2**



**Figure 22b: Growth incidence curve (rural):
Benchmark vs. crisis scenario in year 2**



Source: WB staff calculations based on data from ECH 2011

5.4 Simulation of the 2008/09 crisis

In addition to the crisis scenario outlined above, an alternative crisis scenario has been formulated that assumes conditions similar to those in 2008/09. The 2008 financial crisis did not have a similarly devastating effect on the Uruguayan economy as the Argentine crisis of 2001/02; nevertheless growth declined substantially. The manufacturing sector was affected due to its strong linkages with MERCOSUR and particularly Brazil (see also Estrades and LLambí, 2013).

Similarly to the previous analysis, two scenarios are considered. The benchmark scenario is the same as that in the previous section, while under the crisis scenario, a recession similar to that experienced in 2008/09 is simulated: a real GDP growth rate of 1.5 percent in year 1 followed by a mild increase of 2.5 percent in year 2. A particularly sharp decline is assumed for manufacturing, which is immediately affected by the downturn. Overall inflation is projected to remain in the current levels (8.0 percent and 7.5 percent in year 1 and year 2, respectively), but it is mainly explained by a relatively high increase in food prices. Food price inflation is expected to increase to 9.8 percent in year 1 and slightly decline in year 2 to 9.5 percent. Population and labor market projections are very similar to those for the previous scenarios.

Poverty only increases slightly under this crisis scenario (Figure 23). Similar to the previous simulation, poverty declines from 13.7 in 2011 to 11.7 percent in year 2 under the benchmark scenario. Assuming a crisis similar to 2008/09, poverty rates increase to 13.5 in year 1 followed by a slight decline to 12.9 in year 2. This increase represents a poverty rate that is on average 1.1 percentage points higher than it would have been in the absence of the simulated macroeconomic shocks, but still lower than the 2011 levels. Moreover, the simulated poverty rate for year 2 under a crisis similar to that of 2008/09 is 2.3 percentage points lower than that simulated under a crisis similar to the Argentine crisis. In addition, this crisis scenario has a small effect on income inequality (Figure 24).

Figure 23: Impact of the crisis on poverty

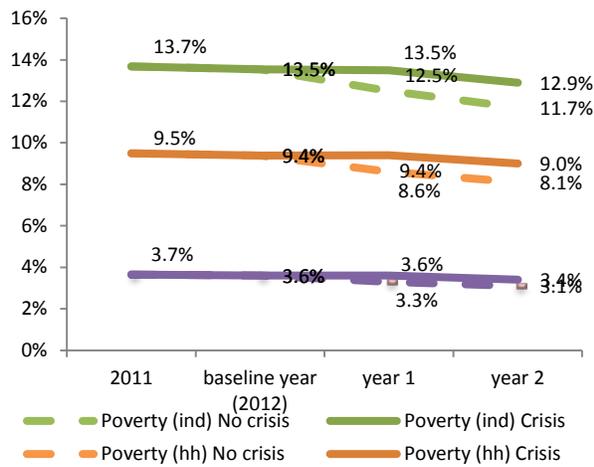
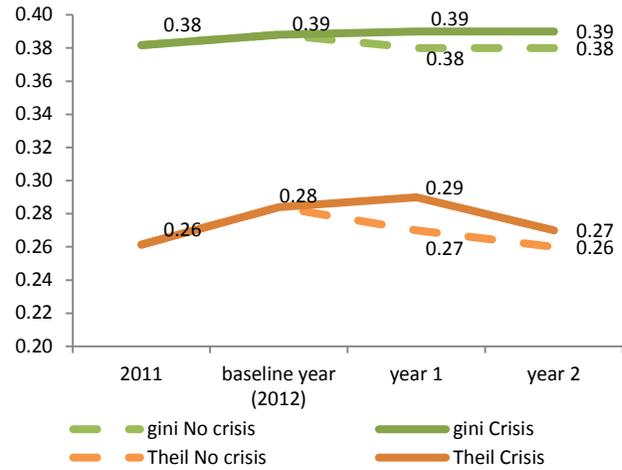


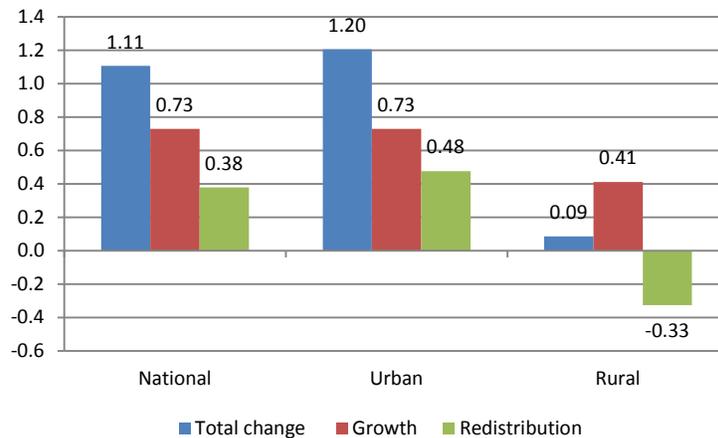
Figure 24: Impact of the crisis on inequality



Source: WB staff calculations based on data from ECH 2011

The lack of growth is the main driver of the poverty increments in both urban and rural areas under the crisis scenario. The results of the Datt and Ravallion (1992) decomposition for year 2 show that higher poverty rates have mainly been caused by lower growth rather than distributional effects (Figure 25). However, in urban areas and at the national level, taking into account *only* the effect of negative growth would understate the rise on moderate poverty levels since redistribution of income increases poverty. In the case of rural areas, however, ignoring the redistribution of income would overstate the rise in poverty.

Figure 25: Datt-Ravallion decomposition – Benchmark vs. crisis scenario in year 2 (percentage change)



Source: WB staff calculations based on data from ECH 2011

6 Policies to protect the vulnerable population from falling back into poverty

6.1 How Uruguay has responded after the 2001/02 crisis

Given the large number of people that indeed fell into poverty during the 2001/02 crisis, one of the biggest challenges for Uruguay in the past decade was post-crisis recovery. As mentioned briefly above, a number of important social programs was implemented or expanded since the 2001/02 crisis. Prior to the crisis, the existing family allowances program, *Asignaciones Familiares*, created in 1943, provided monthly cash benefits to workers in the formal sector with children (Amarante and Vigorito, 2012). Previously, a social pension scheme was implemented in 1919 for the elderly and disabled, targeting socially vulnerable people. Pensions were indexed to the national average wage in 1989, causing government expenditures to increase along with economic growth. These transfers were protected during the crisis in 2002, but were not increased. Given the significant decrease in household income discussed above, *Asignaciones Familiares* was expanded in 2004 to include households with incomes less than \$39/month (thrice the national minimum wage), but the benefits provided were low so there was not a strong short-term reduction of poverty.

Recognizing the need for further assistance to the poor to facilitate their social inclusion, the PANES program was implemented between April 2005 and December 2007 to target the bottom 20 percent of households below the poverty line (8 percent of the total population). This plan had four main components: a cash transfer, a food card, educational and social reinsertion programs, and housing subsidies and public works. Of the households that were selected to participate, almost all received the cash transfer, 80 percent received the food card, and 20 percent participated in the latter two programs. PANES covered 83,000 households (5 percent of total households and 10 percent of the population) and represented 30 percent of household income for beneficiaries. The cost of this program was US\$80 million annually, which represented 0.41 percent of GDP during the period.

To complement the launch of PANES, the *Ministerio de Desarrollo Social* (MIDES) was established as an organization of social protection and to coordinate all the government-provided benefits. The establishment of this organization has proven to be an important centralization of government-provided protection, increasing the efficacy of such programs. This is a vital step given the typical difficulties encountered in social welfare program setup and administration in developing countries and emerging markets.

After the completion of PANES, with poverty rates still very high, there was a transition to the “Equity Plan”. This plan included tax and health care reforms, continued the family allowance (\$8-\$16 cash transfers per child for households that did not exceed the national minimum salary), continued the food cards, expanded coverage of early childhood services and lowered the retirement age, as will be discussed below. There were 364,000 beneficiaries of this plan, which covered 76 percent of destitute children and 68 percent of children living in poverty (2009 numbers) – almost all households living in the poorest quintile. As a result, there was a 30 percent reduction in the incidence of poverty and a 7 percent decrease in the poverty gap. There was an expansion in secondary enrollment, but also informality, since households did not want to cross the income

threshold to lose the benefit. As discussed above, this is a consequence that must be taken into account for future policy discussions.

6.2 Policy options to further protect the poor and vulnerable against the next crisis

As Uruguay has recovered from crisis in the last years, and with most of the population moving into the middle class and into the economic group vulnerable to fall back into poverty (which corresponds to the group of people living with US\$4 to US\$10 a day, at PPP 2005 international \$),¹² a fundamental question for policy makers and international organizations focused on poverty mitigation in Uruguay and other developing countries and emerging markets is how to target scarcer resources to better protect poor and vulnerable households against risks.

One of the key goals of a successful social policy is giving the vulnerable tools to ensure that they do not fall back into poverty in the event of another crisis. Indirect impacts of policy programs are particularly important when considering that the impacts of crises on the poor are not generally restricted to the short run, a concept Fiszbein et al. (2013) calls “cost of risk.” In fact, the short-term ways in which households cope with risks (i.e., perhaps pulling children out of school) can be highly detrimental in the long term. Accordingly, it can be hard to judge the success or failure of a short-term program, as its medium-term effects are harder to assess, but are just as important, if not more so. Moreover, according to Kanbur (2010), crises should be viewed as the “new normal” for developing economies. That is to say, they will be systematic and should be expected, despite the fact that both their timing and type (related to source) are unknown ex ante. Hence, there must be mechanisms in place beforehand for effective coping. Moreover, crises affect countries differently, with small economies being especially vulnerable because of the high dependence on the effect of the crisis (and response to) of the country’s larger neighbors, as seen in the case of Uruguay with Argentina and Brazil at the start of the last decade. However, policy makers face known problems of adverse selection and moral hazard in program design and implementation and further political difficulties in scaling down the intervention after the crisis.

Kanbur (2010) therefore proposes the idea of “stress testing” a system against a range of potential crises to identify gaps in coverage and potential areas to improve flexibility. Once this step is complete, he proposes devoting resources to addressing the holes and the offer of a “pre-qualified line of assistance of social protection which goes into action automatically when crisis-triggers are breached.” The most important point is improving flexibility in policy design and implementation to better target the poor and facilitate scaling down. For example, in the often-referenced case of Mexico’s *Progres-a-Oportunidades* CCT program, parents received payments when children were in school, on the idea that they would no longer need to pull them out of school during a crisis as a risk-coping mechanism. Also, other example was the case of Mexico during the 2008/09 crisis when the government took advantage of the flexibility of available passive labor market policies and allowed for expanded withdraws from contributory pension savings accounts for unemployed workers and extended coverage of health and maternity benefits for unemployed workers who

¹² See Lopez-Calva and Ortiz-Juarez (2013).

contributed to the social security system. These were temporary measures that protected workers and their families during the worst periods of the crisis (Freije et al., 2011).

In addition of higher flexibility in policy design, other option would be to build mechanisms into existing safety nets so that they can expand support for the highly vulnerable people to fall into poverty. For instance, De Janvry et al. (2010) present three areas of special attention by governments for potential expansion of existing or new CCT programs to give them an extended insurance function: (i) eligibility of beneficiaries, (ii) program's effectiveness, and (iii) financial sustainability.

Finally, another option is a more profound redesign of existing programs to address simultaneously the differentiated causes (structural and transient) of poverty and vulnerability to fall back into poverty. In particular, such new interventions should aim for a gradual shift in resources and incentives from CCT programs towards interventions that could create more permanent forms of incomes. For instance, programs that focuses on building the assets of the poor and vulnerable through transfers given for productive purposes such as purchase of equipment or training on business-related topics.

7 Conclusions

In this paper the impact of a severe crisis similar to the Argentine crisis in 2001/02 on the current Uruguayan economy is analyzed. During the 2001/02 crisis, Uruguay's economy suffered significantly, entering a recession and experiencing a doubling of poverty rates and high unemployment rates. The recovery from the crisis took almost a decade. This paper analyzes how the Uruguayan economy today would fare facing a similar crisis to that in 2001/02. Microsimulation techniques that link macro- and microeconomic variables are used to assess the impact of low growth and high inflation on poverty, income inequality and shared prosperity, taking into account household characteristics.

The simulation exercise suggests that Uruguay is now in a better place to weather a severe crisis. While in the 2001/02 crisis, the poverty rate increased from 18.3 percent in 2001 to 39.9 percent in 2004, in the simulated crisis the poverty rate increases by only 1.5 percentage points (13.7 percent in 2011 vs. 15.2 percent in year 2). Moreover, comparing the unemployment rate, in the simulation exercise the unemployment rate increases from 6 percent in 2011 to 9 percent in year 2, while during the Argentine crisis the unemployment rate reached 17 percent in 2002 up from 11 percent in 1999. A large contributing factor to the increased resilience has been improved and expanded social safety nets.

Comparing the crisis and benchmark scenario shows a slight increase in poverty but a significant impact on shared prosperity. The simulation exercise predicts that, in the case of a negative shock, the poverty headcount rate would be 2.9 percentage points higher in the crisis scenario when compared to the benchmark scenario. At the household level, the poverty rate is 2.3 percentage points higher in the crisis scenario. Inequality remains relatively constant in both scenarios. In addition, the simulation predicts a decline of 8.8 percentage points in the income growth of the bottom 40 under the crisis scenario vis-à-vis the benchmark scenario.

Almost 4 percent of the population is vulnerable to fall back into poverty in case of a crisis. The per capita income of that group would on average be 30 percent lower than in the absence of a crisis. The simulation predicts that households that are “vulnerable to poverty” have a higher incidence of female headship and higher number of members than in the rest of the population. The likelihood of falling back into poverty is also higher in Montevideo than in rural areas, and although the lack of growth is the main underlying reason for this, redistribution of income also plays a role.

Since the 2001/02 crisis, the Government of Uruguay has responded by expanding and creating new social programs. To further protect the poor and vulnerable from falling back into poverty during a potential next crisis, the following policy options should be considered: (i) improving flexibility in program design and implementation to better target the poor and facilitate scaling down, (ii) building mechanisms into existing safety nets so that they can expand support for the highly vulnerable people that fall into poverty, and (iii) redesigning existing programs to address simultaneously the differentiated causes (structural and transient) of poverty and vulnerability to fall back into poverty.

References

- Amarante, V. and Andrea Vigorito, 2012. "The Expansion of Non-Contributory Transfers in Uruguay in Recent Years," Policy Research Brief 29, International Policy Centre for Inclusive Growth.
- Bourguignon, F., M. Bussolo, and L. Pereira da Silva. 2008. "Introduction: Evaluating the impact of Macroeconomic Policies on Poverty and Income Distribution", in *The Impact of Macroeconomic Policies on poverty and Income Distribution*, eds. Bourguignon, F., Bussolo, M. and Pereira da Silva, L. Washington DC, The World Bank.
- Cotlear, D. (Editor). 2011. Population Aging: Is LAC ready?, World Bank, 2011.
- Datt, Gaurav and M. Ravallion. 1992. "Growth and redistribution components of changes in poverty measures: A decomposition with applications to Brazil and India in the 1980s," *Journal of Development Economics*, Elsevier, vol. 38(2), pages 275-295, April.
- de Janvry, Alain, Elisabeth Sadoulet, and Renos Vakis. 2010. "Protecting Vulnerable Children From Uninsured Risks: Adapting Conditional Cash Transfer Programs to Provide Broader Safety Nets." *Well-being and Social Policy* 6(1): 161-183
- Estrades, C. and C. LLambí. 2013. "Lessons from the 2008 Financial Crisis: Policy Responses to External Shocks in Uruguay." *The Developing Economies*, 51(3), 233-259.
- Ferreira, F., P. Leite, L. Pereira da Silva, and P. Picchetti. 2008. "Can the Distributional Impacts of Macroeconomic Shocks Be Predicted? A Comparison on Top-Down Macro-Micro Models with Historical Data for Brazil" in *The Impact of Macroeconomic Policies on poverty and Income Distribution*, eds. Bourguignon, F., Bussolo, M. and Pereira da Silva, L. Washington DC, The World Bank.
- Fiszbein Ariel, Ravi Kanbur and Ruslan Yemtsov, "Social Protection, Poverty and the Post-2015 Agenda", Paper, May, 2013.
- Freije, S., G. Lopez-Acevedo and E. Rodriguez-Oreggia (2011). "Effects of the 2008-09 Economic Crisis on Labor Markets in Mexico". Policy Research Working Paper Series 5840, The World Bank.
- Habib, B., A. Narayan, S. Olivieri, and C. Sanchez-Paramo. 2010a. "Assessing Ex Ante the Poverty and Distributional Impact of the Global Crisis in a Developing Country: A Micro-simulation Approach with Application to Bangladesh". Policy Research Working Paper 5238. The World Bank, Washington DC.
- _____ 2010b. "Assessing poverty and distributional impacts of the global crisis in the Philippines : a microsimulation approach". Policy Research Working Paper 5286. The World Bank, Washington DC.

- _____ 2010c. "The impact of the financial crisis on poverty and income distribution: Insights from simulations in selected countries". PREM Economic Premise 7. The World Bank, Washington DC.
- Ravi Kanbur, "Stress Testing for the Poverty Impacts of the Next Crisis", June, 2010, revised version published in in Ambar Narayan and Carolina Sánchez-Páramo (eds.). *Knowing, When You Do Not Know*, The World Bank, pp. 50-55, 2012.
- Ravi Kanbur, "Protecting the Poor Against the Next Crisis", Paper, Distinguished Lecture Series, Egyptian Centre for Economic Studies, Cairo, April, 2010.
- Líneas De Pobreza E Indigencia 2006: Metodología y Resultados. INE 2006.
- López-Calva, L.F. and N. Lustig (Editors). 2010. *Declining Inequality in Latin America: A Decade of Progress*. UNDP-Brookings Institution Press. Baltimore, MD.
- Lopez-Calva, L.F. and Eduardo Ortiz-Juarez "A Vulnerability Approach to the Definition of the Middle Class" *Journal of Economic Inequality* (2013)
- Rofman, R. (Editor), 2013. "Hacia un Uruguay más equitativo: Los desafíos del sistema de protección social". Banco Mundial.
- World Bank. 2012. Potential impact of a global economic slowdown: The Uruguayan case, Internal briefing note.
- _____ 2005. Uruguay: Sources of Growth, World Bank, Report No. 31737-UY, Washington, DC.
- _____ 2013. La Evolución de la Pobreza, la Desigualdad y la Movilidad de Ingresos en Uruguay durante la Década del 2000, Internal Briefing note.
- _____ ADePT Crisis Module. Test Version. Other modules of the ADePT software <http://worldbank.org/adept>.

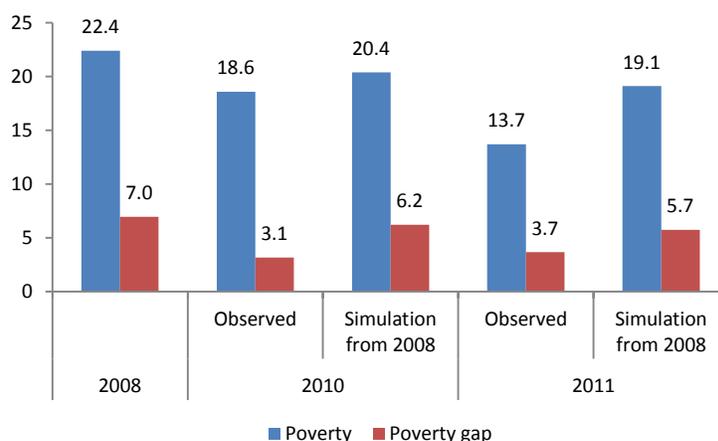
Annex 1: Data Appendix

	Monetary Poverty- Official measure
Poverty Measures	<p>Moderate poverty: <i>proportion of the population whose family per capita income is below the total value of the food and the non-food baskets.</i></p> <p>Extreme poverty: <i>proportion of the population whose family per capita income is below the value of the food basket.</i></p>
Poverty lines	<p>Moderate Poverty Line: Official poverty lines depend on food component CBA_{pc} and a non-food component $CBNA_{pc}$ following the formula for the household specific poverty line: $CBA_{pc} * N + CBNA_{pc} * N^{0.8}$ where N is the number of household members. Since the non-food component weight decreases as the members increase, the average household per-capita poverty line per day in Montevideo is equivalent to 239 pesos of 2012 or 9.13 USD PPP (2005) per-capita per day. It is important to mention that line's values differ greatly across regions: a Household in Interior Urbano needs only 6.2 USD PPP (2005) per-capita per day for not to be considered poor while a household in rural areas needs only 4.26 USD PPP (2005) per-capita per day.</p> <p>Extreme Poverty Line: Official poverty lines follow the formula $CBA_{pc} * N$. In this sense, for not being consider poor a household in Montevideo in 2012 needed 69 pesos per capita per day or 2.6 USD PPP (2005) per-capita per day. Extreme poverty lines also vary between regions but in a lower extend: a Household in Interior Urbano needed only 2.44 USD PPP (2005) per-capita per day for not to be considered extreme poor while a household in rural areas needed 2.1 USD PPP (2005) per-capita per day.</p> <p>For a detailed explanation of the poverty methodology please refer to LÍNEAS DE POBREZA E INDIGENCIA 2006: Metodología y Resultados. (INE 2006)</p>
Welfare measure	<p>Measured by per-capita family income, which considers: labor income, transfers, pensions, imputed rent and capital income. Since official income cannot be completely constructed from this source, and adjusted vector was constructed. It replicated official poverty numbers.</p> <p>When an indicator required used data previous to 2006 in order to guarantee sample comparability only Montevideo and Interior urbano were used.</p>
Conversion to real values	Regional prices are deflated to Montevideo using the ratio of average poverty lines. The resulting values are then converted to 2005 prices using CPI values
Data Source	<p>-ECH (2003-2011) from INE.</p> <p>-Macroeconomic information was obtained from Banco Central del Uruguay.</p> <p>- Banco de Previsión Social</p>

Annex 2: Validation of results

In order to validate the accuracy of the simulations, the observed evolution of the macroeconomic variables for the period 2008 to 2010 and 2011 was used to simulate the poverty headcount and poverty gap using as microeconomic input the 2008 ECH dataset. Figure A.1 shows the poverty rate and the poverty gap for 2008 and its observed and simulated evolution for 2010 and 2011. As it can be observed, the model tends to underestimate the reduction of the poverty headcount and poverty gap caused by growth with a bias that increases over time, passing from a difference in the poverty headcounts of 1.8 percentage points in 2010 between the observed and the estimated rate to 5.4 percentage points in 2011.

Figure A.1: Validation of poverty results using 2008 ECH



Source: WB staff calculations based on data from ECH 2011

To understand the level of adjustment of the model, Figure A.2a shows the Datt-Ravallion decomposition between the 2011 observed poverty against that simulated by the model. The difference of 5.4 percentage points between the simulated scenario and the actual value is driven mainly by growth: two-thirds of the difference is explained by differences in the estimated growth rate of the mean and one-third to the distribution of that growth rate. The results of panel A.2a can be interpreted better when taking panel A.2b into account, which display the difference between the simulated growth from 2008 to 2010 (and 2011) and the observed growth for the same period. Importantly, the model tends to underestimate growth at the bottom of the distribution and overestimate growth for the top 5 percentile, which, hence, results in the differences in poverty rates described above (Figure A.1) and the negative distribution effect shown in Figure A.2a. This gap between the estimated and observed income is larger for 2011.

Figure A.2: Difference between observed and estimated income

Figure A.2a: Datt-Ravallion decomposition (2011): Observed vs. Simulated

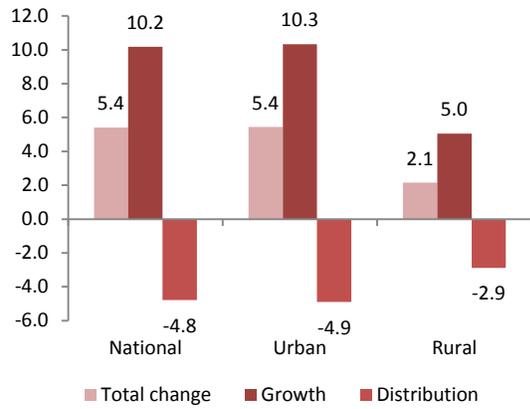
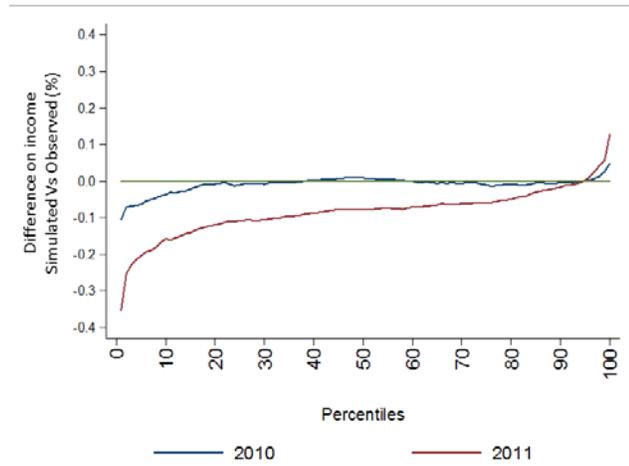


Figure A.2b: Difference between observed and estimated income



Source: WB staff calculations based on data from ECH 2010 and 2011