WORLD BANK GROUP

Poverty and Inequality Monitoring:
Latin America and the Caribbean

Safeguarding Against a Reversal in Social Gains During the Economic Crisis in Brazil

Executive Summary

- Brazil has accomplished impressive reductions in poverty and inequality between 2004 and 2014 as a result of rapidly growing formal employment, higher real wages and redistributive social assistance programs such as Bolsa Família. With labor income as the major source of income of the poor and vulnerable households, the current economic crisis poses a serious threat to the sustainability of the gains in poverty and inequality reduction. As in the 2008-2009 financial crisis, Brazil's social assistance and safety net system has a critical role in safeguarding the social gains achieved so far by preventing more Brazilians from falling into poverty. Yet the expansion of the budget for the social safety net system is hampered by the challenging fiscal consolidation environment in Brazil.

- This note summarizes the findings of the analysis carried out regarding the poverty and inequality impacts of the ongoing economic crisis in Brazil in 2016 and 2017. The first objective is to get an estimate of the extent to which the deteriorating macroeconomic conditions and shrinking labor markets in Brazil will impact on poverty and inequality. The second objective is to generate a detailed profile of the "new poor" associated with the crisis. The third and final objective is to get estimates of the additional budget needed for the Bolsa Família Program to effectively mitigate the poverty impacts of the crisis and protect the past achievements of Brazil in poverty and inequality reduction until the necessary structural reforms take place in Brazil and the engines of growth are reignited.

- The analysis is repeated for two scenarios regarding the changes in real GDP in 2016 and 2017 for the purpose of providing a sufficiently narrow zone for policy decisions anticipating the adverse impacts of the crisis on poverty. The distributional impact of each scenario is evaluated first under the assumption of no changes in the real budget of Bolsa Família and second after allowing for an increase in the real Bolsa Família budget, which allows for an increase in the coverage of the program to the new poor based on the program's current level of "real" benefits and eligibility rules.

- The results of the microsimulation analysis suggest that indicators about inequality and poverty will increase in 2016 and remain high in 2017. In scenario 1, the Gini index measuring inequality is predicted to increase from 0.515 to 0.522 in 2017 as is the poverty headcount ratio (at the R$140 poverty line) which will increase from 8.7% to 9.8% representing an increase in the number of poor by 2.5 million people. In the more pessimistic scenario 2, the Gini increases to 0.524 in 2017 and the higher poverty headcount ratio of 10.3% in 2017 represents an increase in the number of poor by 3.6 million people. However, poverty rates will increase mainly in the urban areas and less in the rural areas (where poverty rates are higher to begin with). The analysis also reveals that the people falling below the poverty line as a consequence of the crisis are likely to be slightly younger in age, skilled, located in urban areas, located in the southeast, previously working in the service sector, and white.

- The depth and duration of the current economic crisis in Brazil gives rise to the opportunity to expand the role of Bolsa Família from an effective redistribution program to a true safety net program that is sufficiently flexible to expand its coverage to the "new poor" households generated by the crisis. The analysis in this note suggests that an increased budget (in real terms) of about 4.73% (R$1.25 billion) and 6.9% (R$1.82 billion) from the 2015 budget of R$26.4 billion, would be a very effective way of targeting scarce financial resources to the most needy among the "new poor" households generated by the crisis. In nominal terms, or in 2017 Reais, the estimate of the budget required in 2017 can be calculated by multiplying the 2015 budget (R$26.4 billion) with the estimated increase in the "real"

Bolsa Família budget (e.g., 1.0473 under scenario 1) and the expected inflation rate between 2015 and 2017 (e.g., 10% or 1.10). Using these specific values, the estimate of the nominal budget required in 2017 is R$30.41 billion.

- The distribution of the additional Bolsa Família budget to the newly eligible households among the "new poor" can prevent the extreme poverty rate in Brazil from increasing beyond the level of 2015, though its impact on preventing the overall poverty rate from increasing is not as dramatic. It is important to bear in mind that the preceding estimates of the additional budget needed for Bolsa Família are derived based on the program's current level of real benefits and eligibility rules and assuming annual adjustments in the nominal budget in par with the annual inflation rate so at to maintain the purchasing power of the benefits constant over time. Delays in adjusting the nominal value of the transfers of Bolsa Família in par with the prevailing inflation rate are likely to lead to higher poverty rates than those estimated in this note (all else equal). As the Brazil Systematic Country Diagnostic (2016) highlights, in spite of the limited fiscal space in the medium run, there is ample scope to expand funding for the most progressive elements of social policy, through reallocations from poorly targeted social transfers and through improvements in the efficiency of spending.
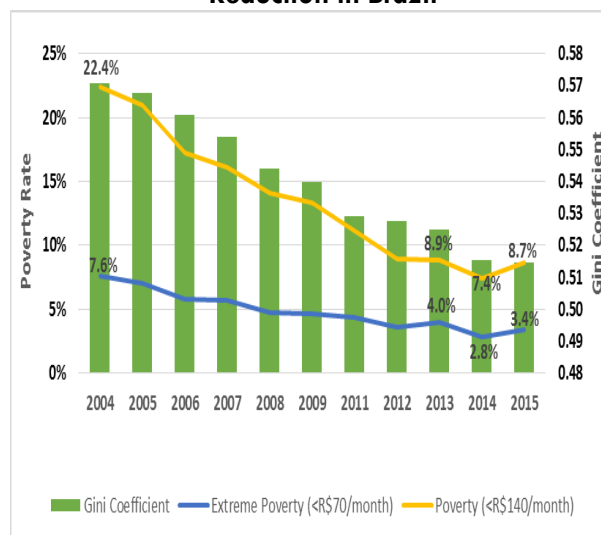
1. Background and Motivation[1]

Between 2004 and 2014, more than 28.6 million Brazilians have escaped poverty. Yet, Brazil remains one of the most unequal countries in the world. The reduction in poverty is an achievement of regional significance, representing almost 50 percent of the reduction in poverty in the whole Latin American and Caribbean (LAC) region (Figure 1). Brazil also experienced a rapid decline in inequality over the past decade, with the Gini coefficient of household incomes falling from 0.57 to 0.52 in 2014. To a large extent, it was due to a policy of social inclusion in the context of a booming economy, fueled by favorable external conditions. Brazil's achievements were also of historical significance, in that it was the first time in the history of Brazil that a sustained reduction in poverty and inequality had been achieved. Nevertheless, even after the reduction in poverty and inequality, Brazil remains one of the most unequal countries in the world, with a Gini coefficient higher than in most countries except Colombia and Honduras in Latin America and Caribbean and a few countries in sub-Saharan Africa.

Labor markets drove shared prosperity, while transfers helped reduce extreme poverty. The road to prosperity for the majority of poorer Brazilians has been through a formal sector job. In this regard, Brazil is similar to other middle-income countries, where labor earnings represent the largest share of income among the B40, and hence the performance of the labor market is a key determinant of poverty reduction and shared prosperity. For the poorest Brazilians, however, social transfers have been more important than labor markets in the past decade. Fifty eight percent of the decline in extreme poverty in Brazil between 2004 and 2014 was due to changes in non-labor income (mainly transfers from the Bolsa Família conditional cash transfer program) (see Figure 2).

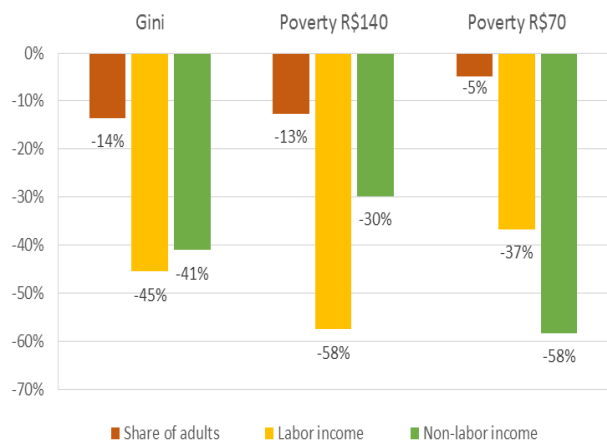**Figure 1: Progress in Poverty and Inequality Reduction in Brazil**

Source: Calculations based on the National Household Sample Survey (PNAD - Pesquisa Nacional de Amostra de Domicílios) 2004–2015.

Favorable external conditions have played a critical role in shaping labor market outcomes in Brazil. The commodity price boom prompted significant real exchange rate appreciation and this in turn encouraged the growth of non-tradable

domestic services. Rising job opportunities for low-skilled workers in these sectors led to rising incomes, which in turn fed back into growing demand for goods and services such as housing, durable goods, and retail or transportation.

Figure 2: Sources of Reductions in Poverty, Extreme Poverty and Inequality, 2004-2014

Source: Calculations using changes in poverty and changes in income by source between PNAD 2004 and 2014
Note: Following Brazil's legal age for adulthood, the component "share of adults" refers to members of housholds of ages 18 and above.

As of the second half of 2015, Brazil is in the midst of a deep recession, with the economy contracting 3.8 percent in 2015 and a similar contraction expected in 2016 (with GDP contracting by 3.4 percent). The budget deficit exceeded 10 percent of GDP last year, and is projected to remain high in the context of political infighting preventing fiscal reforms. Inflation is well above the target range, reflecting increases in regulated prices and the pass-through from currency depreciation.

With labor income as the major source of income of the poor and vulnerable households there is a serious threat to the sustainability of the gains in poverty and inequality reduction. The recession resulted in a loss of 1.6 million formal sector jobs in 2015. Consequently, unemployment has surged, from 4.3 in December 2014 to 11.8 percent in October 2016. Real wages are also contracting, with the average monthly real wage falling 4.2 percent in 2015. Estimates from the recently released 2015 PNAD, collected in October 2015, reveal that the trend in the decline of poverty has reversed with extreme poverty increasing to 3.4% in 2015 (from 2.8% in 2014) and the overall

poverty rate in 2015 increasing to 8.7% (from 7.4% in 2014). At the same time, inequality as measured by the Gini index, seems to have stabilized between 2014 and 2015 at 0.52 points (see Figure 1). The fast increase in unemployment and the fall in real wages is likely to lead to rising poverty in 2016 and possibly in 2017.

Given the depth of the recession, Brazil's social safety net system can play a key role in preventing more Brazilians from falling into poverty. Increases in the budget for social assistance and in particular for the Bolsa Família program can be instrumental for avoiding more severe losses to the social gains achieved in the last decade. Yet the expansion of the budget for the social safety net system is hampered by the challenging fiscal consolidation environment.
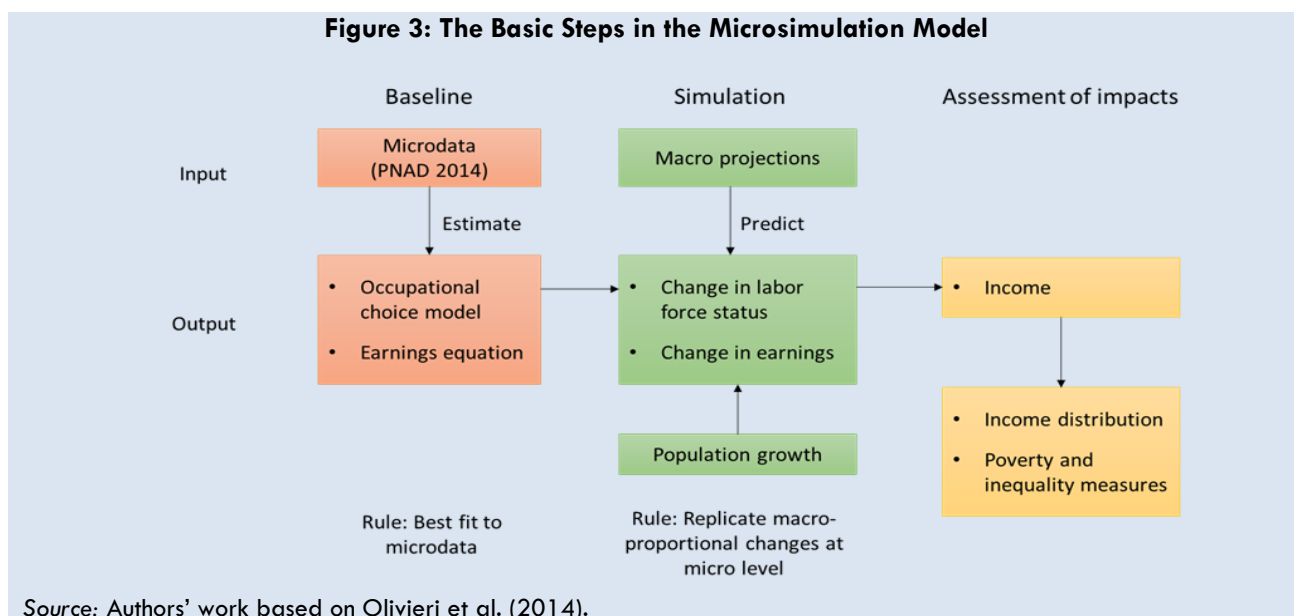
This policy note summarizes the findings of the analysis carried out regarding the poverty and inequality impacts of the ongoing economic crisis in 2016 and 2017. The first objective is to get an estimate of the extent to which the deteriorating macroeconomic conditions and the weak labor markets in Brazil will impact on poverty and inequality in 2016 and in 2017. The second objective is to generate a detailed profile of the "new poor" associated with the crisis. The third and final objective is to get estimates of the additional budget needed for the Bolsa Família Program to effectively mitigate the poverty impacts of the crisis and protect the past achievements of Brazil in poverty and inequality reduction until the necessary reforms take place in Brazil and the engines of growth are reignited.

2. Methodology

The microsimulation model employed for the analysis of the poverty and distributional impacts of the crisis in Brazil, is based on the way macroeconomic shocks are transmitted to the labor market through losses in employment and lower labor earnings.[2] The model combines macro level information on the projected growth of output, employment, population and the labor force participation, with micro level information on labor force status, sector of employment, labor and non-labor income, and basic job characteristics.

3

The microsimulation model involves three basic steps: (1) the estimation of a baseline model; (2) simulation analysis; and (3) impact assessment (see Figure 3 for a visual summary). The first step uses household- and individual-level information to model labor market behavior. Labor force and employment status are divided into five categories in total, and are modeled as functions of household and individual characteristics.[3] Parameters are estimated by means of a multinomial logit model for occupational choice 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 earnings function (Mincer, 1974). The model parameters are estimated based on published data on macroeconomic variables for the baseline year 2015, and on household level data from the 2015 PNAD, officially released to the public domain in November 2016. After removing observations with missing income and non-usual household members (such as maids and their family members), the number of observations used for this analysis is roughly 350,000. The ADePT simulation software used ensures the consistency among the macro variables in the baseline year and the individual aggregates from the micro part of the model.

Figure 3: The Basic Steps in the Microsimulation Model

Source: Authors' work based on Olivieri et al. (2014).

The projected values of the main macroeconomic and demographic variables in the model are key ingredients for the simulation analysis. The growth rate in GDP between 2015 and 2016/2017 in the country overall and in each of the three sectors is obtained from the Fall 2016 issue of the Brazil Macro-Poverty Outlook (MPO) of the World Bank (see Table 1). Specifically, the Brazil MPO forecasts that real GDP for the Brazilian economy overall will decline by 3.4% between 2015 and 2016 and increase by 0.5% between 2016 and 2017. The MPO also predicts that the manufacturing sector will shrink at an annual rate of 3.6% between 2015 and 2016, as well as a decline in real GDP over the same period in the agricultural and service sectors (by 2.5% and 2.8%, respectively). Between 2016 and 2017, it is expected that positive growth rates will reappear for the economy overall and each of the three key sectors. In scenario 2, which is more pessimistic, it is assumed that the decline in real GDP between 2015 and 2016 will the slightly greater than in the baseline scenario 1, i.e., GDP declining by 3.7%, instead of -3.4%, whereas the decline in GDP between 2016 and 2017 continues to be negative at -1.0%, instead of the increase of 0.5% in the base case scenario 1. In scenario 2, the sector-specific declines in GDP are derived by rescaling the change between 2015 and 2016 and between 2016 and 2017.

Table 1. Projected annual GDP change in scenario 1 and 2.

	Scenario 1		Scenario 2	
	2015-2016	**2016-2017**	**2015-2016**	**2016-2017**
Total	-3.4%	0.5%	-3.7%	-1.0%
Agriculture	-2.5%	0.8%	-2.7%	-1.6%
Manufacturing	-3.6%	0.8%	-3.9%	-1.6%
Service	-2.8%	0.6%	-3.0%	-1.2%

Source: World Bank staff estimates.

Based on the parameters estimated for the baseline model with 2015 data, **the second step** simulates the process by which the projected changes in the macroeconomic variables for 2016 and 2017– such as projected changes in aggregate GDP, aggregate employment, the labor force participation rate– are translated into changes in the employment status (and in the sector of employment), and changes in the labor income at the individual or micro level for 2016 and 2017. Specifically, total employment is estimated to change by -1.7% in 2016 and by 0.6% in 2017, by applying the sector specific employment-output elasticities of 0.01 for agriculture, 0.69 for manufacturing, and 1.16 for services on the predicted changes in real GDP in each sector, respectively. Combined with an assumption on how the aggregate labor force participation rate may change with the decline in GDP, the aggregate unemployment rate is derived as a residual. At the micro level, all working-age individuals are reassigned across alternative occupations or unemployment to match the projected aggregate employment changes in specific economic sectors and total employment at the national level. For this purpose, the occupational choice model estimated in the first step for this computation is used. Once individuals are reassigned to new occupational status in 2016 or 2017, his/her new income is estimated based on the parameters of the baseline earnings model.

The **third and final step** of the microsimulation exercise is to assess the poverty and distributional impact of the crisis by generating the new income distribution associated with the projected changes of the key macroeconomic aggregates. The "new" income of individuals and/or households is calculated by adding up the individual "new" labor income estimated in step two above and

household non-labor income, which is held constant in real terms. The new per capita household income also helps to gauge the increase in the Bolsa Família budget required to mitigate the poverty and inequality impacts of the crisis.

The poverty impacts of the crisis are estimated based on the unofficial poverty lines of R$70 and R$140 (in June 2011 prices). The Government of Brazil measures poverty rates using the administrative lines of R$70 per capita per month and R$140 per capita per month (in June 2011 prices) based on the thresholds used to determine eligibility in the Brasil Sem Miséria Plan and the Bolsa Família Program. In April 2014, the Government of Brazil revised the eligibility threshold to R$77 for extreme poverty and R$154 for poverty, while as of June 29, 2016, the eligibility threshold for extreme poverty is R$85 and R$170 for poverty. In spite of the recent increase in the threshold for eligibility, the R$70 and R$140 thresholds (adjusted for inflation) continue to be used as the implicit poverty lines for the estimation of poverty in Brazil and as the yardsticks for monitoring of the Brasil sem Miseria plan.[4] In addition to the poor the vulnerable are defined as those with incomes between R$141 and R$290.[5]

The microsimulation analysis consisting of the three main steps summarized above are repeated for different projected values (under each scenario) of the main macroeconomic and demographic variables between 2016 and 2017. This note summarizes the poverty and distributional impacts associated with two macroeconomic scenarios regarding the projected declines in employment and increases in unemployment in the context of declining aggregate economic activity (see Table 2 below). [6] During the last decade, per

capita GDP and per capita household income have been growing along similar paths. It is conceivable that the current economic crisis breaks this pattern.

The population size in 2016 and 2017 is adjusted based on the actual rate of population change between 2015 and 2016 (using PNAD Continua). The fraction of the working age population (16 years and older) in the labor force, or the labor participation rate, in 2015 and 2016 is also based on PNAD Continua. It is assumed that the labor participation rate in 2016 and 2017 will be approximately the same compared to that in 2015 (actually only 0.1% higher) after accounting for growth in the population from year to year and discouraged worker effects associated with the crisis.[7]

Table 2. Comparison Between Scenario 1 and Scenario 2

Scenario	Year	Annual GDP Change	Unempl. Rate	Labor Force Particip. Rate	Employment change since 2015			
					Total	Agriculture	Manufacturing	Service
1	2016	-3.4%	11.2%	63.6%	-1.7%	-1.6%	-9.6%	-0.2%
	2017	0.5%	11.8%	63.6%	0.6%	0.0%	0.6%	0.7%
2	2016	-3.7%	11.2%	63.6%	-1.7%	-1.6%	-9.6%	-0.2%
	2017	-1.0%	13.3%	63.6%	-1.2%	-0.0%	-1.1%	-1.4%

Source: World Bank staff estimates

Note: Numbers in grey cells are set exogenously whereas numbers in cells with no shade are determined as residuals.

The distributional impact of each one of these scenarios is evaluated first under the assumption of no change in the budget of Bolsa Família and second after allowing for an increase in the Bolsa Família budget and the coverage of the program. The poverty and distributional impacts under these two different scenarios without and with changes in the Bolsa Família budget provide a sufficiently narrow zone for policy decisions anticipating the adverse impacts of the crisis on poverty.

Caveats

As already mentioned, the microsimulations rely on a number of untested assumptions necessary to make microeconomic data consistent with macroeconomic projections.[8] Key among these is the assumption that the structural relationships summarized by the parameters of the regression equations estimated in the baseline year 2015 remain unchanged in 2016 and 2017. In other words, the functional relationships that determine either employment in a specific sector or the wage earned by an individual are assumed to be remain unaffected by the continuation of the crisis in 2016 or the turnaround in real GDP growth in 2017. This assumes, for instance, that the rather unusual decline in the skilled to unskilled wage premium observed between 2002 and 2014 continues during the crisis period.[9] It is conceivable that the skills premium increases again as pressures at the lower part of the wage distribution ease off during the crisis period. To the extent there is a drift back to informality and the minimum wage becomes less binding, the same skill distribution in the population during the crisis period may be associated with very different relative earnings outcomes in 2016-2017 than in 2014, and possibly higher poverty and inequality. Taking into account these caveats associated with the microsimulation model, the estimates of poverty and inequality discussed for scenarios 1 and 2 may actually provide only a lower bound of the poverty and inequality impacts of the crisis. In addition, the model assumes that the factors of production (labor and capital) are immobile across space, and that the rate of change in GDP is the same as the rate of change in household income. Finally, prices are held constant throughout the analysis.[10]
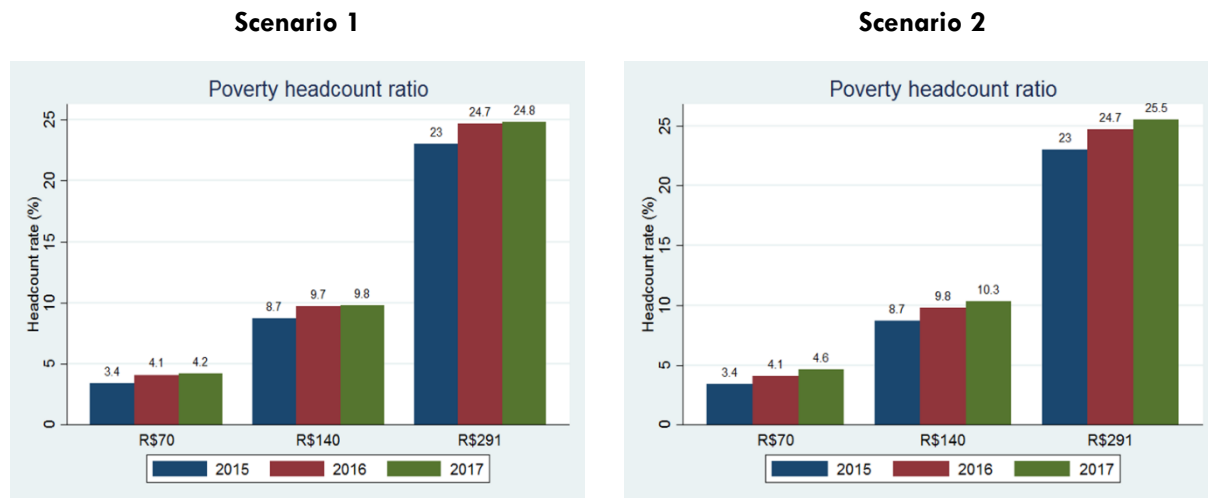
3. Poverty and inequality impacts

According to the results of the microsimulation analysis, poverty headcount ratios will rise in 2016 and remain high in 2017 (see Figure 4). In scenario 1, the number of extreme poor will increase by 1.5 million people, from 6.8 million in 2015 to 8.3 million in 2016 (and to 8.5 million in 2017), raising the extreme poverty headcount ratio from

3.4% in 2015 to 4.1% in 2016 and to 4.2% in 2017. The number of moderate poor will increase by 2.3 million from 17.3 million in 2015 to 19.6 million in 2016 (and to 19.8 million in 2017). This pushes up the poverty headcount ratio from 8.7% to 9.7% in 2016. In the more pessimistic scenario 2, the continuing rise in the extreme poverty rate results in a higher extreme poverty headcount ratio of 4.6%

in 2017, which represents an increase in the number of extreme poor between 2015 and 2017 by 2.6 million people, whereas the higher moderate poverty headcount ratio of 10.3% in 2017 represents an increase in the number of moderate poor by 3.6 million people (between 2015 and 2017).

Figure 4. Poverty headcount ratio

Scenario 1   Scenario 2

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

However, poverty rates will increase more in the urban areas and less in the rural areas (**Figure 5).** In contrast to urban areas where poverty headcount ratios will rise in 2016 and remain at the higher

level in 2017, rural areas in 2017 will have headcount ratios only slightly higher than the ones as of 2015.

Figure 5. Poverty headcount ratio in urban and rural areas
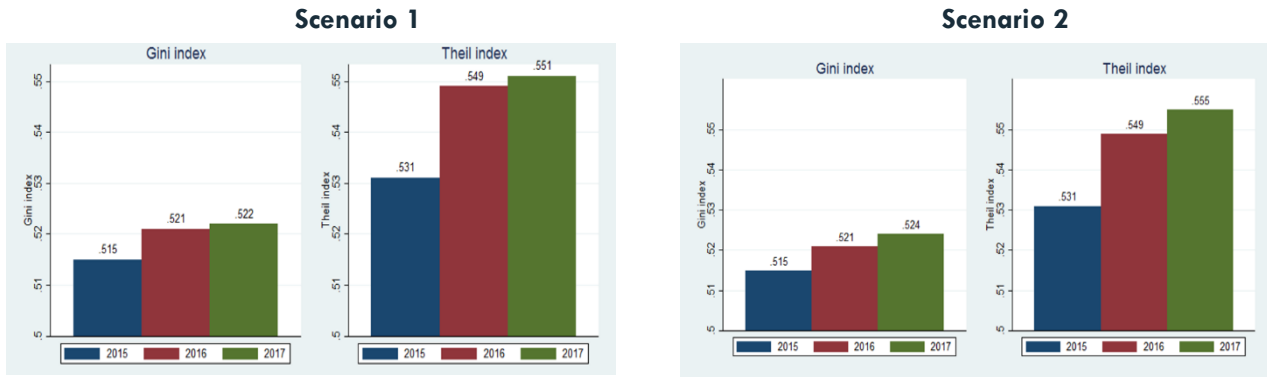

Scenario 1   Scenario 2

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014).

The rise in poverty during the crisis in Brazil will be accompanied by an increase in income inequality in the country (see Figure 6). Moreover,

the predicted increase in inequality appears to be independent of the index of inequality used (e.g., Gini index or Theil index).[11]

Figure 6. Income inequality
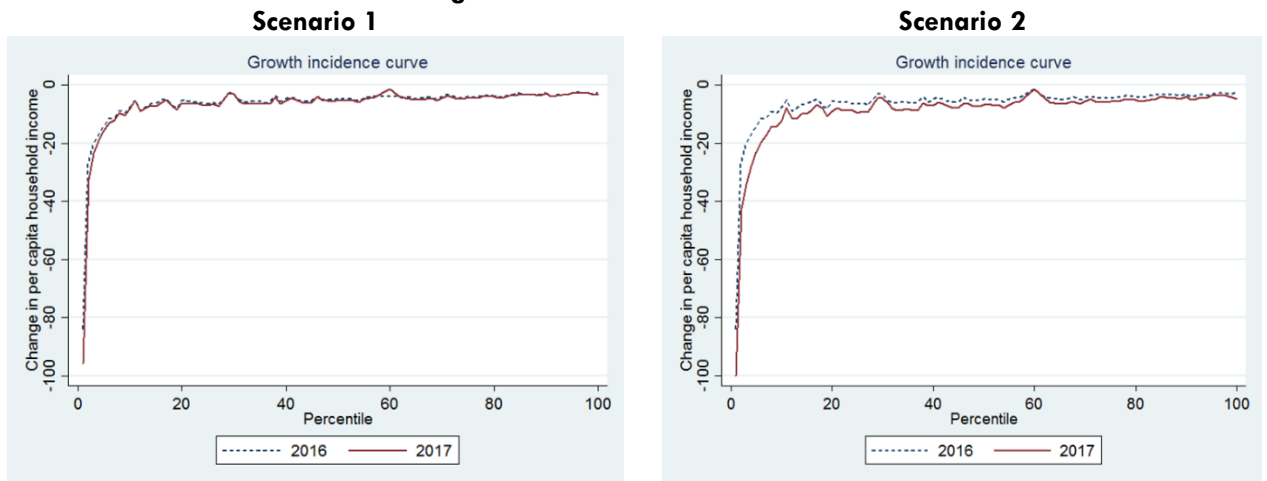
Scenario 1

Scenario 2

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014).

4. Transition Matrices and the Profile of the "New Poor"

As a consequence of the crisis, households at the lower part of the distribution of income in either 2016 or 2017 will have lower income compared to households at the lower part of the income distribution in 2015. Irrespective of the crisis scenario analyzed, the Growth Incidence Curves (GIC) in Figure 7 below reveal that households located at the lower part (bottom 10%) of the distribution of income in 2016 or 2017 will have significantly lower income than households at the corresponding part of the income distribution in 2015. This is even more apparent in the growth incidence curves obtained under the more pessimistic scenario 2. As a result of the crisis, the bottom part of the distribution in 2016 or 2017 is not necessarily

composed of the exact same households in the bottom part of the distribution of income in 2015. Many of the new members of the lower part of the income distribution in 2016/2017 are individuals who in 2015 reported not receiving any non-labor income (including cash transfers from social assistance programs such as Bolsa Família). With the continuation of the crisis in 2016 these individuals lose their jobs and thus their primary source of income, i.e., income from labor.[12] As the analysis below demonstrates, an increase in the budget of the Bolsa Família program that would allow for an increase in the program's coverage, could be a very effective means of mitigating the adverse impacts of the crisis on income and welfare.

Figure 7: Growth Incidence Curves

Scenario 1

Scenario 2

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)
Note: The horizontal axis is the percentile of per capita household income as of 2016 or 2017.

Tables 3a and 3b provide a more detailed picture of the transitions of individuals into and out of poverty and vulnerability between 2015 and 2016/17. Between 2015 and 2016, the year in

which the crisis reaches its peak, 11.8 million people will move one or more steps down the ladder by 2016 (12 million in scenario 2), whereas only 0.2 million people will move up (Table 3a).

Table 3a: Transitions into and out of Poverty and Vulnerability (2015 vs 2016)

<table>
<tr><td></td><td></td><td align="center">Scenario 1</td><td></td><td></td><td></td><td></td><td align="center">Scenario 2</td><td></td><td></td></tr>
</table>

Scenario 1 — 0.2 million move up

		2016			
		<R$70	R$70-R$140	R$140-R$291	>R$291
2015	<R$70	6728	10	8	5
	R$70-R$140	274	10191	37	16
	R$140-R$291	509	768	27378	78
	>R$291	7380	350	2540	149978

11.8 million move down

Scenario 2 — 0.2 million move up

		2016			
		<R$70	R$70-R$140	R$140-R$291	>R$291
2015	<R$70	6728	10	8	5
	R$70-R$140	275	10191	37	16
	R$140-R$291	509	809	27342	73
	>R$291	7380	352	2626	149974

12.0 million move down

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)
Note: Numbers in table are the numbers of individuals in thousands.

Between 2015 and 2017, the differences between scenario 1 and the more pessimistic scenario 2, are more apparent (Table 3b). In scenario 1, 5.8 million people will move one or more steps down the income ladder by 2017, whereas hardly anyone will move up the income ladder. The lower number of people moving down the income ladder in scenario 1 compared to the number of people moving down the income ladder between 2015 and 2016, is due to the fact that by 2017, scenario 1, predicts a modest increase in real GDP. Among the extreme poor as of 2015, 99.98% will remain in extreme poverty in 2017, while 3.1% of moderate poor (0.322M), 2.0% of the vulnerable (0.656M), and 0.5% of middle-class (0.836M) are estimated to fall into the extreme poverty status. Among those in vulnerable status in 2015, 2.9% (0.840M) are estimated to fall into moderate poverty in 2017. Under either scenario, the majority of the people estimated to fall into extreme poverty in 2017 are originating from an income level in 2015 that is above the poverty threshold of R$140.

The microsimulation analysis is also able to shed light on the profile of the "new poor" during this economic crisis. Based on the poverty status, using the R$140 poverty threshold, at the baseline and projected years, individuals can be classified into: 1) new poor, i.e., individuals who were not poor in 2015 but become poor in 2017; 2) structurally poor, i.e., individuals who were poor in 2015 and remain in poverty in 2017; and 3) non-poor, i.e., households who were not poor in 2015 nor in 2017.

Table 3b: Transitions into and out of Poverty and Vulnerability (2015 vs 2017)

Scenario 1

0.0 million move up

Scenario 2

0.0 million move up

		2017			
		<R$70	R$70-R$140	R$140-R$291	>R$291
2015	<R$70	6750	2	0	0
	R$70-R$140	322	10185	6	5
	R$140-R$291	565	840	27320	9
	>R$291	836	303	2971	149485

<center>5.8 million move down</center>

		2017			
		<R$70	R$70-R$140	R$140-R$291	>R$291
2015	<R$70	6751	0	0	0
	R$70-R$140	445	10069	4	0
	R$140-R$291	873	1055	26801	4
	>R$291	1263	427	3815	148091

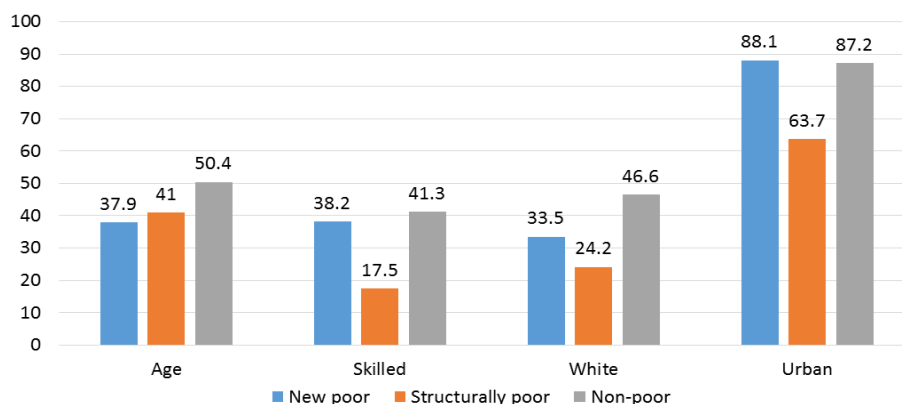<center>7.9 million move down</center>

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)
Note: Numbers in table are the numbers of individuals in thousands

The analysis suggests that the people falling below the poverty line are likely to be younger in age, skilled, located in urban areas, previously working in the service sector, and white. Figure 8 shows how the characteristics of household heads vary across the new poor, structurally poor, and non-poor households, with scenario 2 (the profile was practically identical for scenario 1). The household heads classified as structurally poor are almost 9 years younger than household heads classified as non-poor, and the households classified as "new poor" are three years younger than the structurally poor household heads. A wider gap is evident between the "new poor" and structurally poor in the proportion of skilled people. A comparison of the share of skilled people between structurally poor and non-poor clearly indicates that the structurally poor tend to be low-skilled people.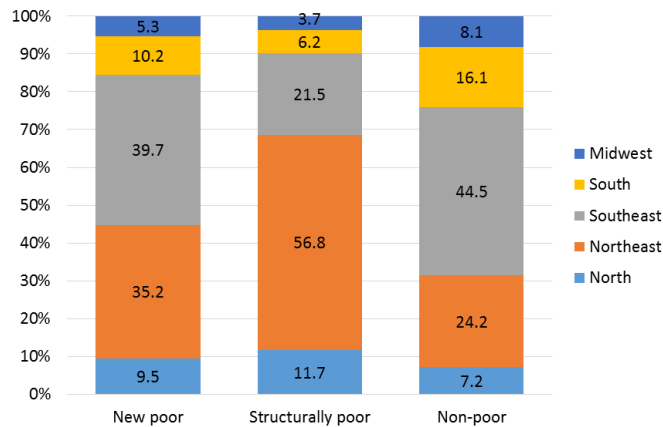 However, the share of skilled people in the pool of the "new poor" is almost as high as in non-poor. This implies that the current economic crisis will push into poverty skilled people who would otherwise be above the poverty threshold. A similar story emerges when comparing the race of the "new poor" and the structurally poor. The share of whites is larger among the non-poor, compared to the structurally poor. However, the "new poor" are more likely to be white than the structurally poor. The analysis also reveals the "new poor" are likely to be located in urban areas. In a similar vein, the "new poor" are estimated to be located primarily in the Southeast while a smaller fraction of them are located in the Northeast, where most of the structurally poor are located (see Figure 9).[13] Finally, the majority of the "new-poor" in 2017 consists of individuals who in 2015 were working in the service sector (see Figure 10).

Figure 8: Characteristics of household head and Poverty Status in 2017 (Scenario 1)
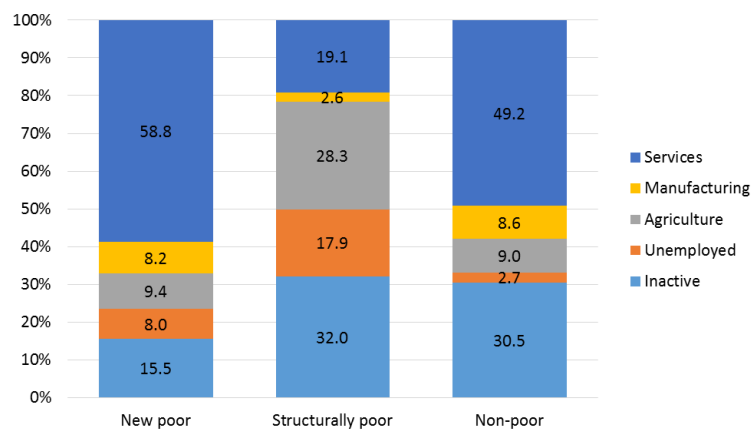

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

Figure 9: Region of Residence (in 2015) and Poverty Status in 2017 (Scenario 1)

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

Figure 10: Occupational Status in 2015 and Poverty Status in 2017

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

5. Mitigating the Poverty Impacts of the Crisis through Bolsa Família

Social assistance in Brazil consists of three main pillars. First, disability benefits provide transfers to older or disabled people known as *Benefício de Prestação Continuada* (BPC); second, the inclusion of self-employed or agricultural family workers into social insurance institutions, such as the Rural Pension Program (*Previdência Social Rural* or PSR); and third, targeted income support, such as the Bolsa Família CCT program. The benefits of the social assistance programs for poverty prevention in old age in Brazil are received primarily by low-income workers, both rural and urban, who move in and out of informality during their working lives (Gragnolati et al. 2013).

Brazil initiated these programs years ago, and other LAC countries have followed suit. Between 2000 and 2013 at least 18 countries in the region introduced inclusive reforms, which sought to increase coverage of the elderly (Rofman et al. 2014).
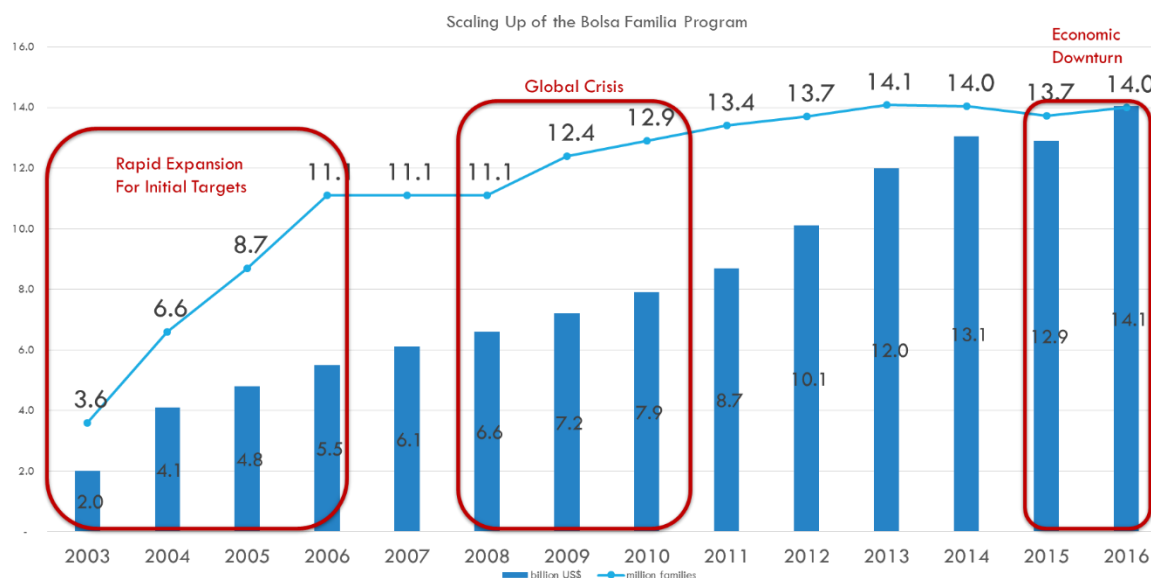
Chronic poverty is addressed through the *Bolsa Família* Program (PBF), the flagship CCT program of the MDS. It provides cash transfers to poor households, conditional on school attendance and use of maternal and child health services. The program was brought to scale at remarkable speed with the number of beneficiaries going from 3.6 million to 11.1 million families in four years (see Figure 11). As of 2014, the program reaches about 56 million individuals or 14 million households— around a

quarter of Brazil's population. Spending as a percentage of GDP increased from less than 0.05 percent of GDP in 2003 to over 0.5 percent in 2013, with the increases in spending since 2011 mostly due to increases in the amount of benefits.

Increases in the Bolsa Família budget have been an effective means of addressing the impacts of

the global financial crisis 2008-2010. As Figure 11 below highlights, the increase of the program's budget and coverage of eligible families during the during the global financial crisis of 2008 to 2010 contributed to the continued decline of poverty and inequality in Brazil (see Figure 1) in spite of a decline (-1.2%) in GDP per capita in 2009.

Figure 11: Bolsa Família Beneficiaries and Spending

Source: MDS and World Bank LAC Social Protection Database.

Changes in non-labor income received from cash transfer programs such as the Bolsa Família program are simulated by appropriate assumptions regarding eligibility criteria and targeting accuracy. Unfortunately, the 2015 PNAD includes no specific information on the benefits received by Bolsa Família beneficiaries. Thus the marginal change in the total amount of Bolsa Família

budget is calculated based on the simulated changes in per capita household income. In 2015, a family with a per capita monthly income less than R$154 is eligible to receive the benefits of Bolsa Família. The amount of payment depends on the levels of per capita income and the number of children, summarized in Table 4 below.

Table 4. Bolsa Família Benefit Structure in 2015

	Per capita income below R$77	Per capita income R$77 – R$154
R$77 per family	Yes	
R$35 per child (age<5) up to 5 children	Yes	Yes
R$42 per teenager (age 15-17) up to 2 teenagers	Yes	Yes
Additional benefit until per capita income reaches R$77	Yes	

Source: MDS (2015).

Table 5 shows how the eligibility of a family for Bolsa Família benefits can change between 2015 and 2017 as a consequence of the crisis. The first group of families, denoted as (1) in Table 5, has per capita income between R$77 and R$154 in 2015 but is projected to have income less than R$77 in 2017. These families become newly eligible for the basic R$77 payment and the amount needed to fill the gap if its per capita income remains under R$77. The second group, denoted by (2), consists of the families who were not eligible for Bolsa Família in 2015 but are predicted to have per capita income less than R$77 in 2017. These families will be able to receive the full Bolsa Família package. The third group is the families who will also become newly eligible for Bolsa Família, but unlike the second group they can receive only payments for children and teenagers since their per capita income in 2017 is estimated to be greater than R$77. The remaining three groups of families (4) through (6) will lose their eligibility for some components of (or the whole package) of Bolsa Família benefits.

Based on the results from the microsimulations, it is possible to obtain estimates of the number of families in each of the six groups in Table 5. Assuming that benefits will be provided to all families that satisfy the criteria in Table 4, it is possible to calculate the additional budget (marginal budget) required by the Bolsa Família Program to cover the households affected in the years 2016 and 2017.

Table 5. Changes in eligibility for Bolsa Família

	2015	2017	Increase	Decrease
(1)	R$77 - R$154	<R$77	Basic + Gap	
(2)	>R$154	<R$77	Basic + Gap + Child/Teen	
(3)	>R$154	R$77 - R$154	Child/Teen	
(4)	<R$77	R$77 - R$154		Basic + Gap
(5)	<R$77	>R$154		Basic + Gap + Child/Teen
(6)	R$77 - R$154	>R$154		Child/Teen

Source: World Bank staff estimates based on MDS (2015)
Note: The same thresholds are used in 2017 as in 2015 because all the analysis in the model is carried out in terms of 2015 prices. The increases in the Bolsa Família benefit structure and eligibility thresholds adopted in June 2016, where practically identical with the prevailing inflation rate between 2015 and 2016.
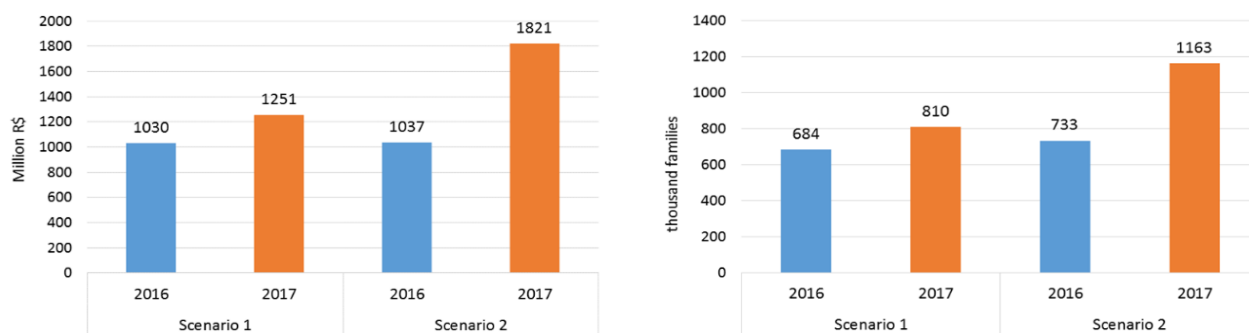
Following the methodology outlined above, the marginal change in the budget of Bolsa Família needed to extend coverage of the program to the "new poor" can be calculated (see Figure 12). Abstracting from operational issues associated with the identification and targeting of the "new poor" households, the microsimulation analysis for scenario 1, implies that in 2017, 0.810M new families (not individuals) will be eligible for Bolsa Família benefits.[14] This entails an increase in the Bolsa Família budget of R$1.25 billion, or a 4.73% increase in the budget (of R$26.4 billion in 2015).[15]

This increase in the budget needed can be broken down in two parts: The R$978M that is needed to cover the 0.522M families falling below the extreme poverty threshold of R$77 per capita per month, and the R$199M that is needed to cover the 0.232M families falling between the thresholds of R$77 and R$154 per capita per month. With scenario 2, in 2017, 1.163M new families will be eligible for Bolsa Família benefits. This entails an increase in the Bolsa Família budget by R$1.82 billion or a of 6.9% increase from the 2015 budget (of R$26.4 billion in 2015).

Figure 12: Marginal change in the budget and the numbers of recipients of Bolsa Família

(a) Marginal Change in the Bolsa Família Budget

(b) Marginal Change in the Number of Bolsa Família recipient families

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

The distribution of the additional Bolsa Família budget to eligible families under the current rules of eligibility can prevent the extreme poverty rate in Brazil from increasing beyond the level of 2015. Figure 13 presents the estimated poverty rates for scenarios 1 and 2 under two alternative assumptions with respect to the budget of Bolsa Família: (i) keeping the real budget constant, which prevents coverage of the "new poor" by the program (without additional BF) and (ii) expanding the real budget of Bolsa Família to increase coverage of the program to the "new poor" generated by the crisis in 2016 and 2017, assuming the current level of real benefits and eligibility rules (with additional BF). In both scenario 1 and 2, expanding the real budget of Bolsa Família to cover the new poor manages to maintain the extreme poverty rate at about the same level as in 2015 (in scenario 1 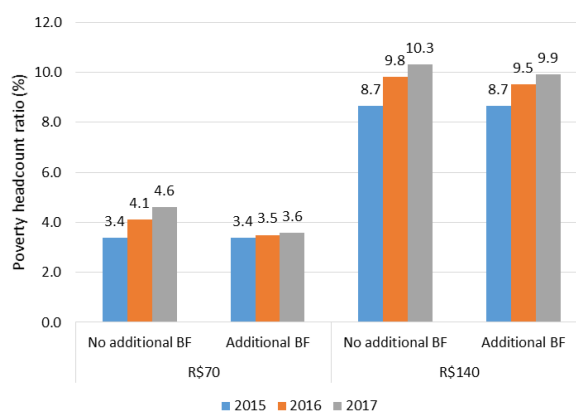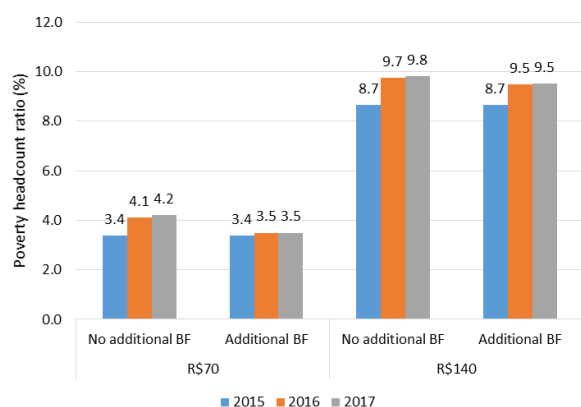the extreme poverty rate increases from 3.4% to 3.5% in 2016 and 2017 whereas in scenario 2 the extreme poverty in 2017 rises to 3.6%). In contrast, the increase in the extreme poverty rate is significantly higher in the absence of any adjustment in the real budget of Bolsa Família.

The Bolsa Família program provides a very effective way of targeting scarce financial resources to the poorest households among the new poor households (see Figure 14). Without the additional Bolsa Família budget, the cumulative distribution curve will shift up (blue line) due to the decline in per capita household income.[16] The transfer of the additional Bolsa Família budget and its distribution to the "new poor" families based on the program's current level of real benefits and eligibility rules will shift the line back to its 2015 position (red line overlapping with grey line depicting the 2015 cumulative distribution of income).

Figure 13: Estimated Poverty Rates without and with increased Bolsa Família coverage
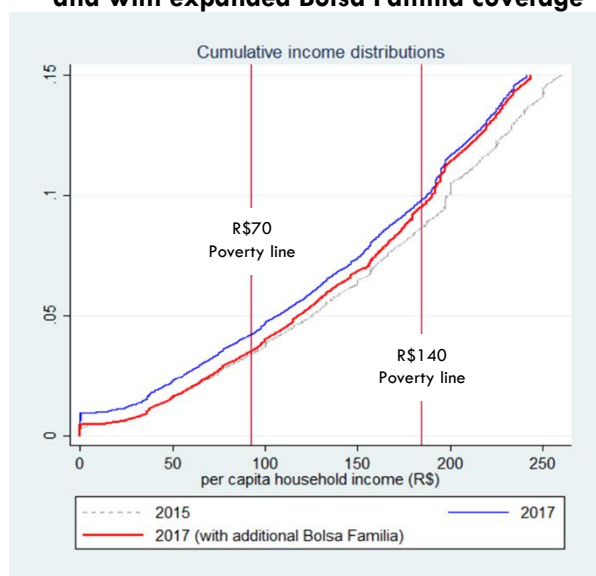
(a) Scenario 1

(b) Scenario 2

Left chart:

Poverty headcount ratio (%)

- R$70, No additional BF: 3.4 (2015), 4.1 (2016), 4.2 (2017)
- R$70, Additional BF: 3.4 (2015), 3.5 (2016), 3.5 (2017)
- R$140, No additional BF: 8.7 (2015), 9.7 (2016), 9.8 (2017)
- R$140, Additional BF: 8.7 (2015), 9.5 (2016), 9.5 (2017)

■ 2015 ■ 2016 ■ 2017

Right chart:

Poverty headcount ratio (%)

- R$70, No additional BF: 3.4 (2015), 4.1 (2016), 4.6 (2017)
- R$70, Additional BF: 3.4 (2015), 3.5 (2016), 3.6 (2017)
- R$140, No additional BF: 8.7 (2015), 9.8 (2016), 10.3 (2017)
- R$140, Additional BF: 8.7 (2015), 9.5 (2016), 9.9 (2017)

■ 2015 ■ 2016 ■ 2017

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

Figure 14: Changes in income distribution without and with expanded Bolsa Família coverage

Cumulative income distributions

R$70 Poverty line

R$140 Poverty line

per capita household income (R$)

- - - 2015   —— 2017
—— 2017 (with additional Bolsa Familia)

Source: World Bank staff estimates based on PNAD 2015 and the ADePT Simulation Module (Olivieri et al. 2014)

Note: The vertical lines in the figures above denote the R$70 poverty line in 2015 Reais (=R$92.3 in 2015) and the R$140 Poverty line in 2015 Reais (= R$184 in 2015).

6. Policy Considerations

The depth and duration of the current economic crisis in Brazil gives rise to the opportunity to expand the role of Bolsa Família from an effective redistribution program to a true safety net program that is sufficiently flexible to expand its coverage to the "new poor" households generated by the crisis. Brazil has managed to build one of the largest safety net systems in the world and the Bolsa Família program constitutes the flagship program of the Ministry of Social Development (MDS). Conditional cash transfer programs such as Bolsa Família do not only have a redistributive role, but also an important role at protecting the poor in times of an economic downturn. To fulfill this function, counter-cyclical (increased) budgets are required at times of crises to increase coverage of the increasing number of poor.

The analysis in this note suggests that an increased budget (in real terms) of about 4.73% (R$1.25 billion) and 6.9% (R$1.82 billion) from the 2015 budget of R$26.4 billion, would be a very effective way of targeting scarce financial resources to the most needy among the "new poor" households generated by the crisis.[17] The distribution of the additional Bolsa Família budget to the newly eligible households among the "new poor" can prevent the extreme poverty rate in Brazil from increasing beyond the level of 2015, though its impact on preventing the overall poverty rate from increasing is not as dramatic. It is important to bear in mind that these estimates are derived based on the program's current level of real benefits and eligibility rules and assuming annual adjustments in the nominal budget in par with the annual inflation rate so at to maintain the purchasing power of the benefits constant over time. Delays in adjusting the nominal value of the transfers of Bolsa Família in par with the prevailing inflation rate are likely to lead to higher poverty rates than those estimated in this note (all else equal).

One encouraging message emerging from this analysis is that the fiscal adjustment currently

under implementation in Brazil can be accomplished at virtually little or no cost to poverty. Even with the depth of the current recession, the social gains Brazil made in the last decade do not appear likely to be reversed under a range of plausible assumptions. This suggests that Brazil has crossed an important threshold, and that is an important legacy of the past decade. The estimated increase in the budget for the Bolsa Família program required to mitigate the impacts of the crisis on extreme poverty is relatively low (less than 7% in the pessimistic growth scenario). As the Brazil Systematic Country Diagnostic (2016) highlights, in spite of the limited fiscal space in the medium run, there is ample scope to increase the budget for the most progressive elements of social policy, through reallocations from entitlement programs and through improvements in the efficiency of public spending.[18]

References

Bourguignon, F., Bussolo, M., Pereira da Silva, L. (2008). "The impact of macroeconomic policies on poverty and income distribution: Macro-micro evaluation techniques and tools." In F. Bourguignon, M. Bussolo, & L. Pereira da Silva (eds.), *The impact of macroeconomic policies on poverty and income distribution: Macro-micro evaluation techniques and tools*. Washington, D.C.: World Bank.

Brazil Macro Poverty Outlook (2016: Fall) Washington D.C., The World Bank.

Brazil Systematic Country Diagnostic (2016) "Retaking the Path to Inclusion, Growth, and Sustainability", May 2016. Report No: 101431-BR, Washington D.C., The World Bank.

Cabanillas, O.B., Lugo, M.A., Nielsen, H., Rodríguez-Castelán, C., & Zanetti, M.P. (2015). "Is Uruguay more resilient this time? Distributional impacts of a crisis similar to the 2001-02 Argentine crisis." *Journal of Banking and Financial Economics, 2*(4), 64-90.

Ferreira, F., Leite, P., Pereira da Silva, L., & Picchetti, P. (2008). "Can the distributional impacts of macroeconomic shocks be predicted? A comparison of top-down macro-micro models with historical data for Brazil." In F. Bouruignon, M. Bussolo, & L. Pereira da Silva (eds.), *The impact of macroeconomic policies on poverty and income distribution: Macro-micro evaluation techniques and tools*. Washington, D.C.: World Bank.

Gragnolati, Michele, Ole Hagen Jorgensen, Romera Rocha, and Anna Fruttero. 2011. Growing Old in an Older Brazil: Implications of Population Aging on Growth, Poverty, Public Finance, and Service Delivery. Washington, DC: World Bank.

MDS (2015). Plano Brazil Sem Miséria: Caderno de Resultados 2011 | 2014.\

Mincer, J. (1974). *Schooling, experience and earnings*. New York: Columbia University Press for the National Bureau of Economic Research.

Olivieri, S., Radyakin, S., Kolenikov, S., Lokshin, M., Narayan, A., & Sánchez-Páramo, C. (2014). *Simulating distributional impacts of macro-dynamics: Theory and practical applications*. Washington, D.C.: World Bank.

Rofman, Rafael, Ignacio Apella, and Evelyn Vezza, eds. 2014. *Beyond Contributory Pensions: Fourteen Experiences with Coverage Expansion in Latin America*. The World Bank. http://elibrary.worldbank.org/doi/book/10.1596/978-1-4648-0390-1.

Skoufias, E. R. Gukovas, and T. Scot (2016) "Variations in Participation and Employment in Brazilian Metropolitan Areas" Background paper for the Brazil Programmatic Poverty Analysis Task of the World Bank.

---

[1] Note prepared by the LAC Poverty and Equity GP Team: Emmanuel Skoufias, Shohei Nakamura, and Renata Gukovas. Martin Raiser, Ricardo Paes de Barros, Pedro Olinto, Oscar Calvo-Gonzalez, and Antonio Nucifora, provided very constructive suggestions and feedback. This note is a revised and updated version of an earlier note using data from the 2014 PNAD as a baseline year.

[2] See Olivieri et al. (2014) for a detailed description of the ADePT simulation module developed for microsimulations of the poverty and welfare impacts of economic crises (http://go.worldbank.org/UDTL02A390) .The ADePT crisis simulation module is based on a simplified version of the approaches developed by Bourguignon, Bussolo, and Pereira da Silva (2008) and Ferreira et al. (2008).

[3] The categories are inactivity (or being out of the labor force), unemployment, and employment in the following three sectors: the primary sector (agriculture, fishing, and mining); manufacturing (including electricity, gas, and water); and services (including the construction sector).

[4] See **DECRETO N° 8.794, DE 29 DE JUNHO DE 2016**

[5] Based on the Secretaria de *Assuntos Estratégicos* (SAE) the middle class consists of individuals with incomes above R$291. http://www.sae.gov.br/imprensa/sae-na-midia/governo-define-que-a-classe-mediatem-renda-entre-r-291-e-r-1-019-cidade-verde-em-24-07-2013/#ixzz35UobUtKL

[6] For more details, see the companion technical note.

[7] Recent work by Bank staff also suggests that during this crisis, discouraged worker effects are likely to dominate instead of the added worker effects that in past crises in Brazil typically contributed to women and other temporary workers increasing their labor force participation during the crisis period (Skoufias, et al. 2016).

[8] See Olivieri et al (2014) for a more detailed discussion of the limitations of the ADePT Simulation module.

[9] See Figure 1.12 in the Brazil Systematic Country Diagnostic (2016) where the evolution of the wage skill premium and inequality is presented.

[10] Given that the analysis is being carried out with only one year of data from the 2015 PNAD, adjusted 2015 nominal income for general inflation between 2015 and 2016 or 2017 compared against a poverty threshold that is also adjusted by the same general inflation rate is equivalent to price changes having no real effects. Another issue related to prices is spatial disparities in the cost of living. Although Brazil does not have an official poverty line, the administrative poverty lines used by the Bolsa Família program make no adjustments for cost of living differences across regions or between urban and rural areas. Alternative simulations carried out (not reported) taking into account spatial cost of living differences in the baseline year using a spatial cost of living index derived from the 2008/9 POF survey yielded qualitatively similar estimates on the distributional impacts of the crisis in Brazil.

[11] The Gini index, for example, is most sensitive to income differences at about the middle of the distribution.

[12] The very large declines for the very bottom percentiles of income are primarily due to extreme values and outliers (i.e., very low but non-zero values of reported income). Reproducing the GIC excluding the bottom 1% of the income distributions yields the same general picture with the maximum decline in income at the "new" bottom percentile of income being around -40%.

[13] Southeast region includes the following States: Minas Gerais, Espirito Santo, Rio de Janeiro, and São Paulo.

[14] In practice, targeting errors are always an issue of concern in the implementation of cash transfer programs such as Bolsa Família, and it is important to develop targeting mechanisms that minimize inclusion and exclusion errors.

[15] Administrative records from the Bolsa Família program report a budget of R$26.4 billion in 2015. The budget calculations in this note, net out the number of families that would graduate or become ineligible from Bolsa Família because of increases in their income. It is also assumed that every family whose per capita income less than R$154 and meeting the official criteria receives the benefit.

[16] The cumulative distribution functions in Figure 14 zoom-in the per capita income range between R$0 and R$250.

[17]The estimate of the nominal budget required in 2017 can be calculated by multiplying the 2015 budget (R$26.4 billion) with the estimated increase in the "real" Bolsa Família budget (e.g., 1.0473 under scenario 1) and the expected inflation rate between 2015 and 2017 (e.g. 10% or 1.10). Using these specific values, the estimate of the nominal budget required in 2017 is R$30.41 billion.

[18] The Brazil Systematic Country Diagnostic (2016) is accessible at:
http://documents.worldbank.org/curated/en/180351467995438283/Brazil-Systematic-country-diagnostic