Bolsa Família after *Brasil Carinhoso:*
an Analysis of the Potential for Reducing Extreme Poverty

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The **Bolsa Família Programme (*Programa Bolsa Família* – PBF)** is a monthly cash transfer from the Brazilian federal government to poor and extremely poor families enrolled in the Single Registry of Social Programmes. Since 2009, transfers last for a minimum period of two years, regardless of changes in household income. However, a family may no longer receive transfers if it fails to abide by certain conditions, such as ensuring that children and adolescents in the family go to school and achieve attendance rates of least 85 per cent during the school year for beneficiary children aged 6-15 and 75 per cent for teenagers aged 16-17. These characteristics classify the PBF as a targeted and conditional cash transfer programme.

From its inception until the introduction of the ***Programa Brasil Carinhoso* (PBC)**, the method for calculating the amounts that each family receives—the benefit design—has undergone modifications. In this *Policy Research Brief*, the new PBF benefit design, implemented in December 2012, is analysed in terms of its potential contribution to overcoming extreme poverty, as laid out in the Plan for Brazil Without Misery *(Plano Brasil Sem Miséria* – PBSM). The first section describes the changes made to PBF's benefit design; the subsequent section uses simulations to illustrate the potential impact of each design on extreme poverty. The simulations suggest that the introduction of the PBC benefit may greatly increase its effectiveness in combating extreme poverty, particularly among children.

I. Changes in the Design of PBF Benefits over 2003–2012

Table 1 (next page) lists the changes in the design of PBF benefits and their adjustments from 2003 to 2012. They can be divided into three categories: eligibility criteria, benefit amounts, and benefit design.

Since its inception the PBF has had two eligibility levels, namely, the extreme poverty line and the poverty line. Families enrolled in the Single Registry whose declared monthly per capita income is lower than R$ 70.00 (roughly US$ 35) are considered extremely poor, while those whose declared monthly per capita income lies between that level and the upper level, R$ 140.00 (US$ 70) are considered poor. Eligibility levels are fundamental parameters when considering issues relating to the coverage of targeted/means tested cash transfer programmes, but its adequacy and rationale will not be discussed in this brief. It is worth noting, however, that they were adjusted three times during the nine years that the programme has been implemented. In 2009, two adjustments took place very close to each other—in April and July—to correct the previous adjustment, which had used amounts whose practicality was dubious. Thus, we can consider that the PBF had three sets of eligibility criteria: R$50 and R$100, from 2003 to 2006; R$60 and R$120, from 2006 to 2009; and R$70 and R$140, from 2009 to 2012.

The benefit levels were readjusted four times: in 2007, 2008, 2009 and 2011. Figure 1 (page 3) shows that the basic and per-child benefits underwent reasonable depreciation until the 2007 adjustment rectified them. In 2009, there was a net increase in all benefits. In 2011, the focus was on readjusting the benefit for children and, to a lesser degree, for adolescents.

At any rate, the real increase in the amount of the average PBF transfer from 2003 to 2011, as shown in Figure 1, was primarily due to changes in the programme's benefit design: introducing the benefit for adolescents in 2007 (with effect as of 2008); expanding the limit of the variable benefit from three to five children in 2011; and introducing the PBC benefit in 2012, which maintained the rising trend of the average transfer received by beneficiary families, despite the decreasing amounts in some of its components (e.g. basic transfer).
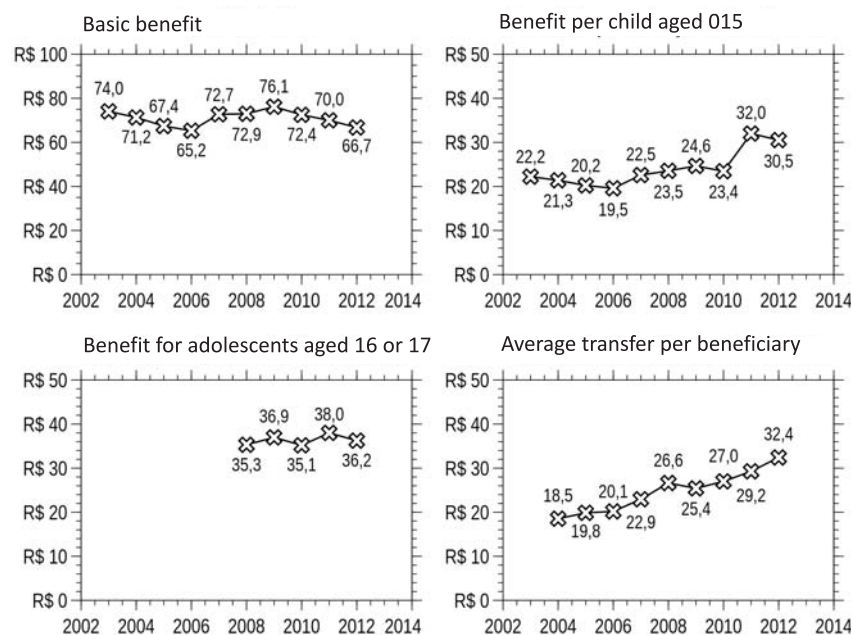
The main result expected from a transfer—conditional or otherwise—is an income increase for the households that receive it. Since 2011 the PBF has been a part of PBSM, which aims to overcome extreme poverty, defined as the situation experienced by families with monthly cash incomes of less than R$70 per capita. Thus, for the PBF to effectively contribute to reaching PBSM's objective, the increase brought about by transfers should be sufficient to raise monthly household income levels to—or over—R$70 per capita.

Table 1

PBF Adjustments and Changes in Benefit Design, 2003–2012

Year	Changes and adjustments	Benefit design (at year end)
2003	**OCTOBER** Creation of the PBF, with two levels of eligibility that referred, but were not bound, to the amounts of 1/4 and 1/2 the minimum wage (R$200 in early 2003) of per capita household income, with a basic benefit given only to extremely poor families, and a variable benefit, given per child aged 0–15 years, for a maximum of three children.	**Extreme Poverty: *income up to R$50*** Basic: R$50 Children: R$15 to R$45 **Poverty: *income from R$50 to R$100*** Children: R$15 to R$45
2006	**APRIL** The eligibility levels are adjusted for the first time, with no change to benefit design.	**Extreme Poverty: *income up to R$60*** Basic: R$50 Children: R$15 to R$45 **Poverty: *income from R$60 to R$120*** Children: R$15 to R$45
2007	**JULY** The benefits are readjusted. **DECEMBER** The benefit design is altered for the first time, with the creation of a benefit for up to two 16- and 17-year-old adolescents.	**Extreme Poverty: *income up to R$60*** Basic: R$58 Children: R$18 to R$45 Adolescents: R$30 to R$60 **Poverty: *income from R$60 to R$120*** Children: R$18 to R$45 Adolescents: R$30 to R$60
2008	**JUNE** The benefits are readjusted.	**Extreme Poverty: *income up to R$60*** Basic: R$62 Children: R$20 to R$60 Adolescents: R$30 to R$60 **Poverty: *income from R$60 to R$120*** Children: R$20 to R$60 Adolescents: R$30 to R$60
2009	**APRIL** The levels are readjusted to R$69 and R$137. **JULY** The eligibility levels are again readjusted to the amounts that would remain in effect at least until the end of 2012. The benefits are also readjusted in July.	**Extreme Poverty: *income up to R$70*** Basic: R$68 Children: R$22 to R$66 Adolescents: R$33 to R$66 **Poverty: *income from R$70 to R$140*** Children: R$22 to R$66 Adolescents: R$33 to R$66
2011	**MARCH** The benefits are readjusted, and the benefit design undergoes a second change, expanding the limit from three to five children.	**Extreme Poverty: *income up to R$70*** Basic: R$70 Children: R$32 to R$160 Adolescents: R$38 to R$76 **Poverty: *income from R$70 to R$140*** Children: R$32 to R$160 Adolescents: R$38 to R$76
2012	**MAY** The PBC's per capita transfer is introduced, aimed at households with at least one child aged 0–6 years, which, even after receiving the PBF benefit, had remained extremely poor. **NOVEMBER** The age range of children eligible to participate in the PBC is redefined as 0–15 years of age.	**WITH CHILDREN AGED 0–15 YEARS** **Extreme Poverty: *income up to R$70*** Basic: R$70 Children: R$32 to R$160 Adolescents: R$38 to R$76 PBC: remaining *per capita* gap **WITHOUT CHILDREN AGED 0–15 YEARS** **Extreme Poverty: *income up to R$70***

Source: Prepared by the authors, based on the relevant legislation (Annex).

As such, the **effectiveness of transfers** hinges on the amount being enough to ensure that the per capita household income reaches or exceeds the extreme poverty line. To reach R$70, a R$20 transfer to a family with an income of R$20 would be ineffective: it would double the family's income without, however, rescuing it from extreme poverty. Therefore, the **extreme poverty gap**—the difference between household income and the extreme poverty line—should be the basic parameter for setting the transferred amount, since it directly informs how far a family is from leaving extreme poverty behind.

However, it was only in 2012, after the introduction of the PBC benefit, that the extreme poverty gap came to have a greater influence in determining the amount of the PBF transfer. In its original design the PBF did not completely disregarded the gap when determining the benefit amount, since it stratifies beneficiaries as poor and

Figure 1

Amount of the Benefits and Average PBF Transfer, 2003–2012 (in 2011 reais – R$)

Source: Prepared by the authors, based on the relevant legislation (Annex), IBGE's National Consumer Price Index (annualised) and information from SAGI/MDS.

Figure 2

Simulation of the Impacts of the Changes in the PBF's Benefit Design and the Creation of the PBC on Household Income – an Example Using Benefit Amounts from 2011 (R$70, R$32 and R$38)
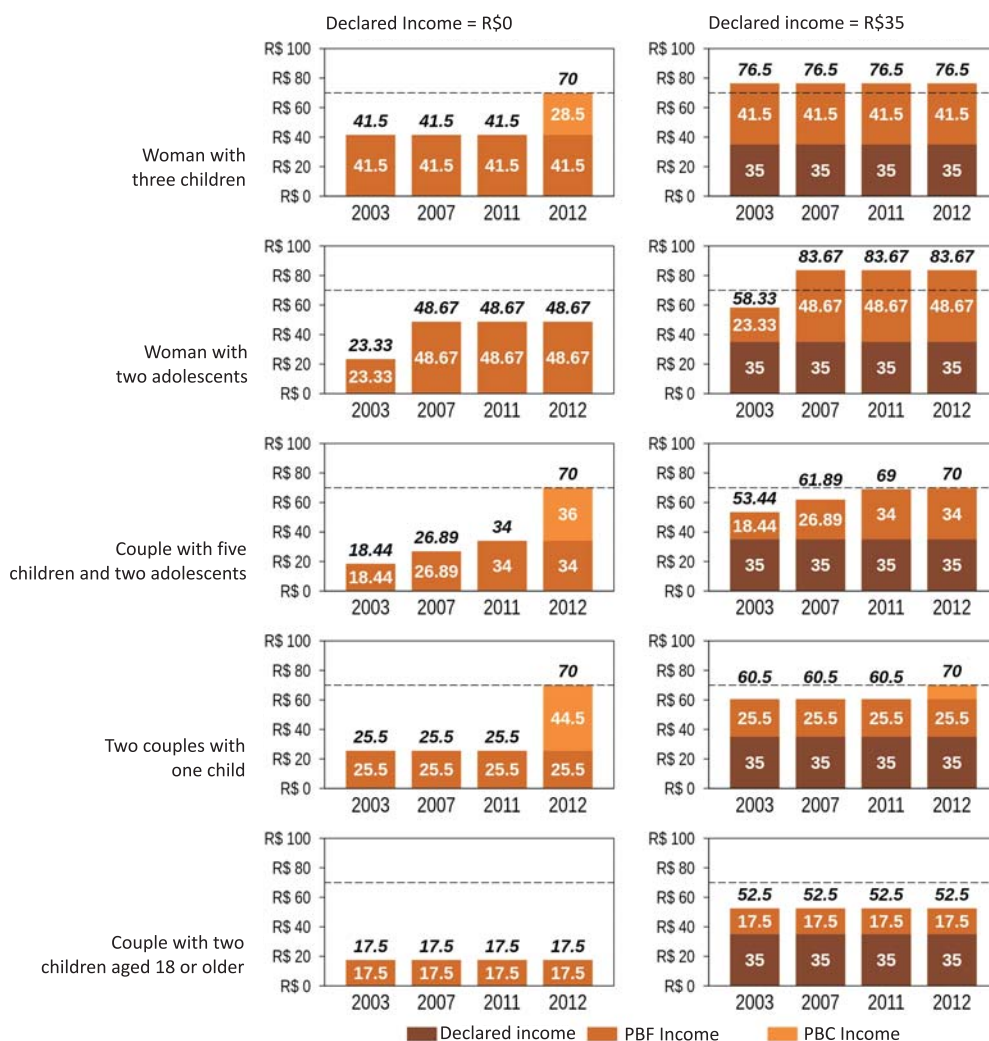
Source: Prepared by the authors, based on the relevant legislation (Annex).

extremely poor, with the latter category entitled to a fixed, per-family transfer: the basic benefit. Within each stratum, however, the benefit design would ignore the gap, stipulating the transfer amount as a function of **household composition**, the number of children up to 15 years of age and, since 2007, also young people aged 16 to 17 years.

Figure 2 illustrates how changes in benefit design affect the effectiveness of the PBF, considering 10 families with five different compositions—regarding the presence of adults, adolescents and children—all extremely poor. Each row has two families of the same composition, but zero income was assigned to the family on the left, while a monthly per capita income of R$35, half the extreme poverty line, was assigned to the family on the right.

Comparing the two columns in Figure 2, we note that the benefit design adopted from 2003 to 2011 was effective only for families that had monthly per capita income closer to R$70, and was unable to lift from extreme poverty those families that suffered from it most intensely—those with no income (or with a very low income level).

However, when comparing the rows in Figure 2, we see that the design penalised larger families, particularly those with many members aged 18 or older, and also those with many children aged 0–15, especially before 2011. In other words, until 2011 the benefit design favoured rescuing families in less severe extreme poverty and would favour small, single-parent families and families with children aged 16–17 years with higher per capita amounts.

The introduction of the PBC in 2012 radically altered the benefit design. Considering the sum of PBF and PBC benefits by household composition, **the total transfer amount is equal to the extreme poverty gap** for families with children aged 0–15 years which remain extremely poor after receiving the transfer by household composition. Thus, the larger amounts transferred under the PBC variable benefit are aimed at large families with many children and many adults, for whom the PBF was ineffective. Households without family members aged 0 to 15, however, continue to have their transfers defined in terms of household composition, and, if their income is low, they will likely remain in extreme poverty. But families without any children are a minority among those that are extremely poor.

II. Simulation of the Potential Impact of Design Changes to PBF Benefits on Extreme Poverty

To simulate the potential impact of benefit design changes on extreme poverty, data were analysed from the 2011 National Survey by Household Sampling (*Pesquisa Nacional por Amostra de Domicílios* – PNAD), conducted by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatistica – IBGE). The PNAD suffers from a problem typical of household surveys: the low quality of income data at the lower and upper end of the distribution—basically for the very poor and the very rich households. This problem causes household surveys to under-report the income from cash transfer programmes. That is, based on the household survey, we estimate a number of beneficiaries within the population that is lower than what appears on the PBF payroll.

This requires that **the original data be corrected** to simulate the impacts of the programme (details for this procedure can be found in the Annex). After the correction, approximately 2.7 million households are converted to PBF beneficiaries.

Once the data are corrected, PBF transfers for beneficiary families are simulated with current amounts, but in accordance with the benefit designs in effect in 2003, 2007, 2011 and 2012. The simulation exercises are conducted as in Figure 2, for thousands of families sampled by the PNAD. The results can be seen in Figure 3, with six sub-charts, all using the same structure, and the extreme poverty line of R$70 highlighted as a dashed, horizontal line.

On the horizontal axis we emphasise the poorest 10 per cent of the population, which comprises the portion living in extreme poverty, the primary scheme by income after PBF, and the secondary one by income before the PBF—the family's own income. The vertical axis shows the per capita household income.

The first sub-chart shows the income of the poorest 10 per cent before the PBF. The extreme poverty rate of the population would be 5.3 per cent in 2011, and higher for the population aged 0–15 years, at 9.7 per cent. It should be noted that these rates are derived from the corrected 2011 PNAD (annexed). In all sub-charts, the extreme poverty rate is equal to the length of the line going from point (0, R$70) to where the red area ends, which, in turn, is equivalent to the extreme poverty gap. **The best benefit design to combat extreme poverty is the one that reduces the width of the red area the most.** A design that reduced it only in height would decrease the intensity of poverty (the gap) but not its incidence (the percentage of people who are extremely poor).
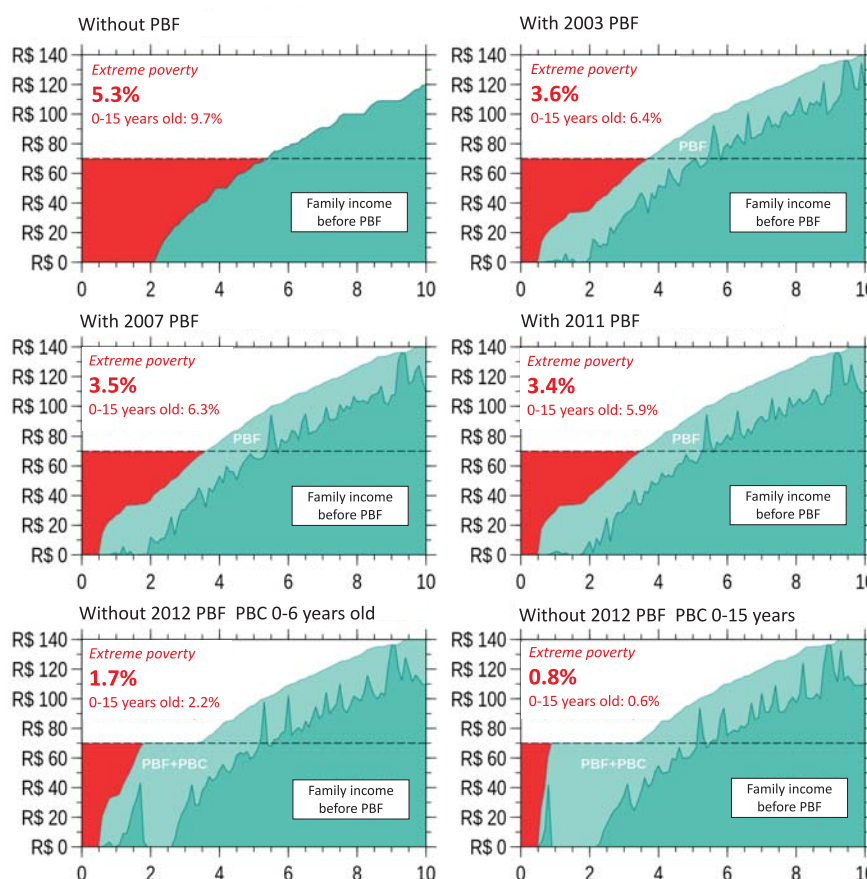
Sub-chart 'With PBF 2003' simulates the transfers with the benefit design of that year: up to three benefits per child, plus the basic benefit for extremely poor households.

When the income from the transfer is added to the families' own incomes, the red area is reduced in both width and height; that is, the PBF, even in its original design, reduced both the rate and intensity of extreme poverty. As such, if the original design were in effect in 2011, using the benefit amounts for that year, the PBF could have lowered extreme poverty from 5.3 to 3.6 per cent; for children aged 0–15 years, it would have been lowered from 9.7 to 6.4 per cent.

In the two following sub-charts, 'With PBF 2007' and 'With PBF 2011', we see that, with the creation of the benefit for adolescents and subsequent expansion of the number of beneficiaries of the variable benefit from three to five children, there was a very small increase in effectiveness compared to the original design.

The change in 2011 was a bit better in terms of reducing child poverty, but the improvement in effectiveness was also small. It should be noted that the simulation with the 2011 design indicates (considering database imperfections) the impact of the PBF during that year, since the readjustments and expansion of the limit to five children were already in effect when the PNAD was conducted.

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Figure 3

Simulation of the Impacts of the Changes in the PBF's Benefit Design and the Creation of the PBC on Household Income, using Benefit Amounts for 2011 (R$70, R$32 and R$38)

Without PBF

Extreme poverty
5.3%
0-15 years old: 9.7%

Family income before PBF

With 2003 PBF

Extreme poverty
3.6%
0-15 years old: 6.4%

PBF

Family income before PBF

With 2007 PBF

Extreme poverty
3.5%
0-15 years old: 6.3%

PBF

Family income before PBF

With 2011 PBF

Extreme poverty
3.4%
0-15 years old: 5.9%

PBF

Family income before PBF

Without 2012 PBF PBC 0-6 years old

Extreme poverty
1.7%
0-15 years old: 2.2%

PBF+PBC

Family income before PBF

Without 2012 PBF PBC 0-15 years

Extreme poverty
0.8%
0-15 years old: 0.6%

PBF+PBC

Family income before PBF

Source: Prepared by the authors, based on the relevant legislation (see Annex) and the 2011 National Survey by Household Sampling by IBGE, corrected for the PBF simulation using the methodology described in Souza, Osório and Soares (2011).

The small improvements in effectiveness of the 2007 and 2011 designs are precisely because they were tied to household composition, and not to the extreme poverty gap. When the benefit for adolescents was created, all PBF families with adolescents received it, whether they were poor or extremely poor—even those whose income had already reached the levels set by the previous PBF benefit design scheme. And, for many extremely poor families with very low incomes, the added per capita benefit for adolescents was not enough to lift their incomes up to the extreme poverty line.

The same occurred with the increase in the number of eligible beneficiary children, from three to five. That is, by disregarding the extreme poverty gap, additional benefits resulted in income gains for families which had already left extreme poverty behind and which, therefore, did not need a larger transfer; at the same time, the additional amounts going to the neediest families was small.

The last row of Figure 3 clearly shows the improvement in the effectiveness of benefit design after the introduction of the PBC. Instead of raising the entire distribution, it only increases the income of people who remained extremely poor after receiving the PBF, as per the 2011 design. Thus, the PBC does not pay anything more for families who have overcome extreme poverty, focusing all its efforts on the neediest families. If the PBC for families with children aged 0–6 years had been implemented in 2011, despite the readjustment of benefits tied to household composition and

the increase in the number of eligible beneficiary children, extreme poverty could have been half the 3.4 per cent recorded in 2011. If the PBC for families with children up to 15 years of age had been adopted in 2011, it could have reduced extreme poverty to less than 1 per cent of the population, with the added potential to bring about an unprecedented situation in Brazilian history, a poverty rate for those aged 0–15 years at a lower level than that of the general population.

Another interesting aspect in simulating the PBF with the PBC design for children aged 0–15 years is that the red area becomes nearly rectangular. This means that most of the beneficiary families will exit extreme poverty. There will be very few PBF families without children aged 0–15 remaining in extreme poverty. In fact, the number should be so small that, for the sake of simplifying the design of benefits and of greater effectiveness in combating extreme poverty, the federal government should consider freezing the amounts of benefits linked to household composition (variable benefit) and extend the PBC benefit to all extremely poor PBF families. Such a strategy would certainly reduce the cost per person rescued from extreme poverty by the PBF.

Lastly, it should be noted that the effectiveness of the PBF relies on other aspects not covered by this document, such as the eligible population and the income volatility (variance) of extremely poor families. This latter aspect is particularly important because the PBC complements the gap relative to reported income. Although it may be a

reasonable hypothesis to assume that the income declared by the household represents the lower limit—or something close to it—of the monthly fluctuations in household income, families whose income is below the stated level at the time of measurement will appear extremely poor, despite receiving the PBC benefit. In addition, the new design (linking the amount to the gap) may, in solving the old problems, end up creating entirely new ones. Therefore, special attention should be paid to monitoring the Single Registry in 2013, to check whether more closely linking the transferred amount to declared income will not have the adverse side effect of encouraging families to strategically under-declare their incomes in an attempt to receive larger benefits.

III. Final Comments

The objective of this policy brief was merely to assess whether it would be reasonable to expect improvements in effectiveness of the PBF to combat extreme poverty, as a result of the radical change in benefit design caused by the introduction of the PBC. As discussed, the pre-PBC benefit design almost completely ignored the household income gap, determining transfer amounts by household composition—that is, by the presence of children and adolescents—and not by the intensity of extreme poverty. With PBC, most families with children aged 0–15 years who remained extremely poor under the PBF have, in practice, begun to receive a per capita benefit of the amount of the difference between the per capita income declared in the Single Registry and the extreme poverty line used by the PBSM of R$70 per capita each month.

Despite the old design, in 2011 the PBF reduced the extreme poverty rate from 5.3 to 3.4 per cent and the poverty rate of the population aged 0–15 years from 9.7 to 5.9 per cent. However, if the late-2012, post-PBC design had been implemented in 2011, the resulting figures would have been, respectively, 0.8 per cent and 0.6 per cent. Therefore, according to the simulations, the change in benefit design introduced by the PBC may enable the PBF to combat extreme poverty much more effectively. More importantly, it can bring about an unprecedented situation in Brazilian history: an extreme poverty rate for children aged 0–15 years that is close to that of the general population.

Finally, it should be emphasised that the simulations of the PBC's potential impact on extreme poverty are just simulations—not predictions of the future. When it is released, in the second half of 2013, the 2012 PNAD will enable us to investigate the reduction in extreme poverty caused by the introduction of the PBC for families with children aged 0–6 years. But only in 2014, based on the results of the 2013 PNAD, will we will be able to assess the impact of the PBC expanded to children aged 0–15 (which began in December 2012, after the PNAD went out into the field). Until then, the dynamics of other factors such as economic growth and the employment level will change, for better or for worse, the context to which the PBF applies. Therefore, one cannot state that the extreme poverty rate will fall to less than 1 per cent in 2013, but one can certainly say that the poverty reduction caused by changes in benefit design will be far greater than what would have been obtained with earlier designs.

Annex

A1. **Legislation pertaining to benefit design adjustments and changes**

20 October 2003: Provisional Measure 132 (converted into Law 10.836/04 and regulated by Decree 5.209/04)
<http://www.planalto.gov.br/ccivil_03/mpv/Antigas_2003/132.htm>

11 April 2006: Decree 5,749 <http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2006/Decreto/D5749.htm>

16 July 2007: Decree 6,157 <http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Decreto/D6157.htm>

28 December 2007: Provisional Measure 411 (converted into Law 11.692/08)
<http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Mpv/411.htm>

26 June 2008: Decree 6,491 <http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2008/Decreto/D6491.htm>

16 April 2009: Decree 6,824 <http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Decreto/D6824.htm>

30 July 2009: Decree 6,917 <http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Decreto/D6917.htm>

01 March 2011: Decree 7,447 <http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Decreto/D7447.htm>

02 June 2011: Provisional Measure 535 (converted into Law 12.512/11 and regulated by Decree 7.572/11)
<http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Mpv/535.htm>

14 May 2012: Provisional Measure 570 (converted into Law 12.722/12)
<http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/Mpv/570.htm>

29 November 2012: Provisional Measure 590
<http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Mpv/590.htm>

A2. Correction of the original data for the simulations

The correction of the original PNAD 2011 data, for the purposes of simulating the impact of the PBF, is performed according to the methodology developed by Souza, Osório and Soares (2011). The data is processed in three steps: a reconciliation between the number of PBF beneficiaries within the PNAD and the number in the administrative records; a cluster analysis, to separate families with zero per capita incomes but that do not fit the profile of extreme poverty; and the assignment of PBF amounts according to the amounts in effect in 2011, and the benefit designs of the 2003, 2007, 2011 and 2012. It is worth noting that all procedures take into account only the residents of permanent private households, excluding pensioners, domestic workers or relatives of domestic workers (who do not enter into the calculation of per capita household income, according to the concept used by IBGE).

A2.1. Reconciling the number of beneficiaries

A recurring problem in household surveys, which complicates the study of the impacts of social policies, is the under-reporting of the number of government programme beneficiaries (Mathiowetz, Brown and Bound, 2001; Weinberg et al., 1999; Wheaton, 2007; Meyer, Mok and Sullivan, 2009). The PNAD is no exception: in all its editions, the number of PBF beneficiaries—and those of other programmes—is lower than what administrative records show. Therefore, for the programme's costs and impacts to be simulated, one needs to reconcile the number of beneficiaries according to the PNAD and the official data.

The first step of this reconciliation is identifying the declared PBF beneficiaries within the PNAD. This is done through a variant of the 'typical values' method, which has been used by researchers because the PNAD does not have a specific variable to capture PBF income, nor a regular question for identifying beneficiaries. Beneficiaries are identified through the declaration of amounts compatible with PBF transfers in the 'other income' variable (V1273). All households whose sum of all family members' income (in the 'other income' variable) was equal to or lower than the PBF's ceiling in 2011 (R$306) were considered to be programme beneficiaries (Souza, Osório and Soares, 2011; Soares et al., 2007; Barros, 2007; Barros, Carvalho and Franco, 2007). This procedure identifies a set of beneficiaries in the sample, which represents 10.5 million families. However, this number is lower than the 13.25 million seen in the Single Registry in December 2011.

The second step is the inclusion of the 2.7 million beneficiary families missing from the PNAD. This is done by combining a probit model with the pairing of families that have already been identified. Probit is used to estimate the probability of all PNAD households participating in the PBF: its dependent variable, therefore, is whether or not a household is a programme beneficiary, while the independent variables include the logarithm for per capita household income, the number of family members in the household, the presence or absence of children aged 0–15 years, the age (in groups) of the household reference person,

the unit of the federation, living in an urban or rural area, the type of area (metropolitan region, self-representative or non-self-representative municipality) and dichotomous variables for walls made of durable materials, a durable roof, exclusive bathroom, basic sanitation, garbage collection, car, stove, electricity, telephone, land telephone line, mobile telephone, colour television, washing machine and a computer.

After adjusting the probit and predicting the likelihood of each family participating in the PBF, 2.7 million families are then randomly selected (expanded sample) and identified as PBF participants through the typical values method. For each of these families, we seek out a family that does **not** participate in the PBF, but whose participation is more likely; these paired, non-participating families are transformed into PBF beneficiaries. The advantage of randomly selecting families that already participate is that the inclusion of new families does not alter the distributional profile of the programme.

A2.2. Separation of families with zero income and without a poverty profile

PNAD information about income refers to the last month before the interview took place –usually September. Such a short reference period causes the data to be affected by the income variations of extremely poor households. Although the PNAD does take certain precautions to minimise this, such as asking the 'usual' earned income, not the actual earned income (Rocha, 2003), there is nothing to ensure that the income declared to the PNAD is actually the 'usual' income. Households with incomes from informal sources, for example, tend to experience large income fluctuations and are unlikely to have a clear sense of their usual income.

The main problem in studying extreme poverty is that a short reference period generates families with zero income. It is unlikely that a 'rich' household will temporarily have a per capita income level ranging from R$1 to R$70, but there are many situations that can cause the income in a given month to be zero:

"A non-poor family may have zero income in an observed month due to individual decisions made by income earners, such as investing time in capacity-building or changing jobs—or even due to adverse and temporary shocks, such as lack of work for the self-employed, temporary disability or unemployment. The cause is not relevant, so long as its effects remain temporary and the household's permanent income remains high, by relying on other mechanisms—such as savings or even the sympathy of relatives—to protect themselves from the temporary lack of income."
(Osório, Soares and Souza, 2011)

Table A1

Indicators Selected for Extremely Poor and Non-poor Families with Zero Per Capita Household Income, Brazil, 2011

	Schooling level (years of study)	Basic sanitation (%)	Washing machine (%)	Computer (%)
Extremely poor	2.21	64.6	24.3	7.2
Non-poor	10.62	85.2	45.5	42.3

Source: PNAD 2011.

Indeed, Osório, Soares and Souza (2011) show that it is possible to separate the families with incomes equal to zero, according to the 2009 PNAD, into two groups: one has a very poor profile, while the other group has a profile that is typically not as poor. As such, and to prevent artificially inflating the percentage of extreme poverty, this problem must also be remedied within the 2011 PNAD.

The identification of the 'non-poor' among households with incomes equal to zero was achieved using the **cluster analysis** method, separating them into two groups based on a set of variables related to the household's socio-economic status: schooling level (years of schooling of the most highly educated family member), number of residents, walls made out of durable materials, roofs made out durable materials, exclusive bathroom, basic sanitation, garbage collection, car, stove, electricity, land telephone line, mobile phone, colour television, washing machine and a computer. Table A1 shows the differences in the profiles of the two groups.

After the cluster analysis, we assign the average per capita household income for all 'non-poor' individuals. This distorts the PNAD's income distribution but nonetheless solves the problem of analysing extreme poverty, which is our goal; as such, we do not present data about the impact on inequality.

A2.3. **Assignment of PBF transfers**

The last step in data processing is the actual simulation, wherein benefits are assigned, according to 2011 amounts and different benefit designs. In other words, the benefits identified through the 'typical values' method are discarded and replaced with benefits whose amounts fit the rules. This is a necessary step, because even though the 'typical values' method may correctly assess the average transferred amount, it is imprecise by definition, also because households tend to report rounded transfer amounts (for example, R$30 instead of R$32, or R$40 instead of R$38).

For families originally identified as beneficiaries, the assignment of actual amounts is quite simple: first, we assign the variable benefits for children and adolescents, according to household composition. Next, we subtract the

total of such benefits from the total PBF income, found by using the 'typical values' method. In 2011, since just over 85 per cent of PBF beneficiary families received the basic benefit, we simply assigned this benefit to (approximately) 85 per cent of the highest amounts, after subtraction.

For households added to the PBF after reconciliation with administrative records, the procedure was slightly different. The variable benefits for children and adolescents were also

calculated according to household composition. However, to avoid distributive distortions, the assignment of the basic benefit took another route: first, we classified all beneficiary households—the original ones and those added later—in terms of multiples of the extreme poverty line (R$70) in per capita household income without the PBF; subsequently, for the households added during reconciliation, assignments were done randomly within each band, following the basic benefit ratio observed in the corresponding band among the originally identified households.

Table A2

Comparison of the Original PNAD to the Reconciled PNAD and the Single Registry

	Original PNAD	Reconciled PNAD	Single Registry
PBF families (million)	10.518	13.176	13.250
Amount transferred (R$ million)	1346.5	1596.3	1581.0
PBF families with a basic benefit (%)	-	86.8	86.5

Source: PNAD 2011; Single Registry (December 2011).

Table A2 compares the results of these procedures to data from the Single Registry in December 2011. The figures in the reconciled PNAD are much closer to the administrative data than those in the original PNAD.

■

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