Basic Income and Stakeholder Grants: Jointly Breaking the Long History of Endemic Poverty and Economic Inequality in Brazil (Giving the fish, but teaching to fish)

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Abstract

Basic Income and Stakeholder Grants are amongst the most discussed income distribution policies today. The former allows a monthly amount to be granted to each citizen of the country and is interpreted by many as the fish that will feed the person that month. The latter proposes giving the citizen an amount of money as he/she reaches the age of adulthood as an incentive to finish high school, learn a profession and start working, and therefore making the grant yield. This paper assesses *ex-ante* the implementation of both policies in Brazil by using advanced computer microsimulation modeling in the Brazilian Household Survey (*Pesquisa Nacional por Amostra de Domicílios,* PNAD), and demographic techniques for long term projection. It was concluded that the Stakeholders Grants program is more effective not only for reducing inequality and eliminating endemic poverty, but also because of its lower costs when compared to Basic Income. However, as its benefits are long-term, in order to reduce the harmful effects of inadequate income distribution, also discussed in this paper, Basic Income must be implemented at once. Nevertheless, this program does not eliminate the intergeneration transmission of poverty and inequality, though. Hence, in order to have a more just and better country in the future it is also important to implement Stakeholder Grants.

Introduction

There is a great debate in world academic literature between Basic Income and Stakeholder Grants supporters. Both income redistribution policies are based on the same philosophy: nobody should be poor in a society that has resources for everyone. For this reason both receive criticism because for many people, income redistribution involves restraining the market and violating basic freedoms through taxation on the citizen's lawfully earned money and also over the country's economy, which works below its full capacity. In the one hand, both policies defend citizenship and income distribution. On the other hand, these policies propose different redistribution systems that reflect distinct points of view about what would be best in moral and pragmatic terms for the society and its economy. While Basic Income is focused on decreasing income inequality distributing a monthly amount to each citizen, Stakeholder Grants aims at reducing income inequality by tackling opportunity disparity.

This paper analyzes and assesses *ex-ante* the implementation of both policies in Brazil. The conclusion is that in the case of a country with one of the largest economies in the world, with average per capita income, but with extreme economic inequality and a large poor population, it is necessary to implement both policies concurrently in order not only to solve the problem of endemic poverty but also to break its transmission cycle, which has been secularly repeated over generations. Simply giving the fish is not enough, but teaching to fish in long-term those who have no food to live today is infeasible.

The econometric microsimulation modeling technique in the Brazilian Household Survey (PNAD) was used to assess both proposals. PNAD is the survey done by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatistica,* IBGE) to provide basic information for the study of the socioeconomic development of the country, such as general characteristics of the population, education, labor force, income, housing, etc. In the case of Stakeholder Grants, demographic techniques were also used for long-term analysis. Microsimulation permits the assessment of changes in the micro-units of the survey by projecting various scenarios and evaluating the population after the accomplishment of each one of the policies.

The first part of this paper analyzes the necessity of implementing the policies in order to reduce inequality in Brazil, particularly because it affects the wellbeing of the society and the efficiency of the economy. The second part compares the two proposals, Basic Income and Stakeholder Grants, their similarities and differences. The third part discusses the microsimulation methodology. Finally, the forth part presents the results of the simulation and discusses the necessity of implementing both policies simultaneously to break the poverty and inequality transmission cycle.

The Importance of Reducing Inequality

Although Brazil is not a poor country, it has one the greatest economic inequalities in the world, regardless of the parameter used to measure it. Income is ill distributed and wealth is extremely concentrated. The strong opportunity inequality, based on the fact that one's future depends more on background than on personal skills, is one of the elements that contribute to the transmission of economic inequality from one generation to the next. The environment, mainly the social position, in which a person is born determines his/her access to education and to the labor market. This distribution pattern is also responsible for unequal access of the population to public services, assets and bank credit.

The first problem presented by such extreme inequality is moral. In the big cities, it is quite common to encounter undernourished children living in tenements and slums, exposed to many illnesses due to lack of sanitation and education, and a small fraction of the population with a very high standard of living, with access to imported goods such as cars, designer label clothing and jewelry. The wellbeing statistics of the population reflect the unequal access to public services as well as the fact that one percent of the rich and fifty percent of the poor have almost the same portion of the country's GDP, of which twenty percent of the poor receive only two percent. The gap between rich and poor becomes evident by the analysis of indicators such as child mortality, education, number of children, access to potable water and basic sanitation. Table 1 depicts the effects of economic inequality on life expectancy at birth and fertility rate.

Table 1 – Life Expectancy and Fertility Rate by Family Income

Per Capita Family Income (minimum wage)	<1/4	¼ - ½	½ -1	1 – 3	3 – 5	> 5	Total
Life Expectancy (years)	67.2	71.4	71.4	75.3	79.4	81.1	71.0
Fertility Rate	4.6	3.2	2.4	1.6	1.3	1.1	2.4

Source: Carvalho and Garcia (2004) and Berquó and Cavenagui (2004) [apud Rios-Neto (2006) and 2005)]

The second problem is social cohesion and low social mobility. The great inequality has a negative effect on social cohesion since such diverse people do not consider themselves as part of the same society. This wear and tear of the social fabric leads to violence, increasing criminality rates[1], social exclusion and even political instability. Within the social and economic interface, there is an increase in the cost of public safety due to high criminality, and in private security due to the aggressive behavior of employees at work[2].

In economic terms, the problem is equally serious. The strong inequality hinders economic growth, increases poverty, delays its reduction when the country growths[3], and produces enormous opportunity costs by not exploiting the work potential of millions of unemployed citizens, mainly young. In the interim, macroeconomically, there is a reduction in the country's capacity of responding to economic volatility[4].

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[1] Refer to Mendonça (2003) on the relation between inequality and violence and criminality.
[2] Refer to Bowles (1998)
[3] Refer to Bourguignon (2003)
[4] Refer to De Ferranti (2004) and Amsberg et al (2003) for a more complete assessment of the malefactions of inequality.

Basic Income versus Stakeholder Grants

Policies like stakeholder grants, basic income[5], minimum income and negative income tax have many common aspects. They support fair distribution as a method of promoting economic equity within a society. They recognize that a citizen has the right to benefit from the wealth of the community and are liberal in relation to the use of resources for the wellbeing of the people. These policies aim at reducing inequality and poverty, and permitting social inclusion of the destitute classes. If these policies have a lot in common, and if the minimum income system is already established in Brazil due to the work of Senator and Professor Eduardo Suplicy, why propose Stakeholder Grants, a new and unknown policy? Wouldn't the transfer of monthly income be more secure for the citizen instead of giving out a lump-sum? What if the person loses the grant in a badly succeeded financial operation? What are the advantages of the proposed policy?

It was Thomas Paine, one of the founding fathers of the American nation, who in 1797 first had the idea of giving youngsters a grant of assets to be used as a life starter. The plan was once again proposed in 1999 by Professors Bruce Ackerman and Anne Alstott, from Yale Law School, in the book *The Stakeholder Society*. Nowadays, there are many countries that have implemented programs for the formation of resources by the destitute population. Both United States of America and England have developed universal projects of asset formation. In the US, projects like *Children's Saving Account* or *Young Adult's Fund* were defended by both 2002 presidential candidates, although they were not implemented by the Bush administration. In the 2008 election, Democratic pre-candidate Hillary Clinton also defended the same idea. In England, the *Child Trust Fund*[6] was set up by Blair following the 2001 general election.

Although programs of periodic fund transfer alleviate poverty, they do not eradicate it. According to Og Francisco Leme, from The Liberal Institute, in his article in Suplicy (1993, page 245), it is important to stress that the Basic Income Program helps to alleviate the consequences of poverty, at least part of them, but is not a tool for poverty eradication. At the 1998 International Conference on Minimum Income held in Brasilia, Professor Ricardo Henriques stated that although the Minimum Income Program is a redistribution program, it must not be presented as an instrument to make poverty eradication feasible. According to the

[5] The Basic Income program permits the citizen to have a suitable standard of living and distributes a grant which is, according to Van Parijs (1995), "the greatest possible". The Brazilian minimum income program proposes a subsistence amount, less than U$2.00 per day. Often the two terms, basic and minimum income, are alternatively used in literature.
[6] Refer to the HM Treasury (2003) for the complete Child Trust Fund program

economist, this program is only one element to fight poverty and does not have the power to eradicate poverty. Henriques states that minimum income must be seen as compensatory, <u>and must be implemented together with other long-term social programs.</u> (Suplicy (org) 1998b, pages 149 and 155).

Policies that enhance school education and increase school attendance are vital to the war against inequality. However, they are not enough. In Mexico, since 1990 the programs of income transfer conditioned to education (*Progresa*, later called *Oportunidades*) have shown a substantial increase in youngsters graduating from high school, but with no posterior professional opportunities. The Stakeholder Grants project aspires to complement these programs, giving the youngsters an allowance to start their professional life and to stimulate economic growth.

In the proposed Stakeholder Grants program, children receive annual deposits in a bank account, from birth to the age of 18. During the following three years, the young adult receives the savings monthly yield in his/her bank account, and will have the opportunity of learning to deal with money. Total access to the funds is only possible for young adults that have reached the age of 21, with a high school diploma and not serving a criminal sentence at the time. Due to the fact that access to the money is bound to completion of high school, there is a clear incentive to high school attendance as well as to college enrolment for those who choose to finance their studies with the grant received. The bounding of the grant to the fact that the youngsters must not serving a criminal sentence encourages them to keep away from dangerous and underpaid illicit activities. The proposed program reduces the existing opportunity differences and promotes meritocracy, as the young adults are responsible for their own results.

The person then becomes part of the market economy, and the wealth distribution enhances the market's efficiency as a result of individual effort. The program's main strength lies in the basic economic principle that people respond to incentives. On medium and long terms, the school educated young adults who receive a grant of assets, the stakeholder grant, will more willingly participate in the country's social and political life, strengthening their representativeness, claiming their rights and finally breaking the cycle of poverty.

The Stakeholder Grants program gives those placed at the base of the social pyramid the opportunity of being active agents in the development process. Brazilian economist Celso Furtado (1981, p. 133s) analysis the regional development policies and affirms that income inequalities amongst inhabitants are widespread, arguing that it is necessary not only to eliminate these income differences, but also to transform the society so that the development

can benefit the majority of the population. According to the author, the strategic objective should be to give space to the socially underprivileged so they can be active agents in the development process. This first impulse to break the structures that shackle the underprivileged will only happen with the implementation of policies like Stakeholder Grants.

However, the program's main proposal is also its main source of criticism. Carole Paterman (2002, p. 134ss) states that the main reason for basic income programs to be preferred over stakeholder grants is that the capital can be easily wasted or lost, which leaves the person in the same economic conditions as before. The author reaffirms that the grant can be lost not only by irresponsible people, on drugs or drinking, but also by hardworking people in bad investments. Basic income monthly payments permit a modest but respectable standard of living and play the role of insurance against inappropriate expenses. The maximum amount that can be spent on drinking, drugs and bad investments is the monthly sum received that month. Even if this does occur, the following month's deposit is guaranteed.

Robert Goodin (2002, p. 68ss) reinforces Paterman's criticism on the loss of the grant. He reasons that the Stakeholder Grants program proposed by Ackerman and Alsttot is not immune to bad application choices, or even good choices that turn bad. Therefore, there will always be a percentage of the population below the poverty threshold and demanding government services. These demands must not go ignored and, besides spending with the stakeholder grants, the government will have to increase expenses to meet them. This situation will then increase criticism from those against welfare programs. Goodin proposes a conditional Stakeholder Grants program: those unemployed for at least 12 months could present the government with a project and would receive funding if it is approved. Therefore, an unemployed joiner could solicit funding to buy necessary equipment to set up a joinery, or a dressmaker could request support for a sewing machine, and so on.

Both the basic income for all and the grant for young adult programs have two common principles. Firstly, all citizens have the right to a slice of the wealth accumulated throughout history with the help of all society, i.e., these programs are strongly linked to citizenship. Secondly, each person must be free to use the resources in order to maximize their use. Both seek to reduce economic inequality and social exclusion, besides offering greater opportunities for people to be happy. However, the implementation format brings profound differences. Stakeholder Grants can be easily transformed into monthly income: the beneficiary invests the money and receives monthly interest. If the recipient of the monthly income decides to invest in equipment to set up a shop, for example, he/she would either have to save money during a long period of time and sacrifice consumption or borrow money from

the bank with the income as collateral, and pay interest rate, which is very high in Brazil[7], constituting an unnecessary expense. The transformation of a flow of payments into a lump-sum is like a buying on an installment plan, which is very risky due to the high interest rates. Stakeholder grants permit the person to start life struggling for growth, as it is like receiving an inheritance in the beginning of one's professional life, and this money can be used to invest in the future by starting a business, buying a house or paying for college.

According to the research by a center designed to study public policies in Brazil (*Núcleo de Estudos de Políticas Públicas*, NEPP) of Campinas State University, cited in Suplicy (1998a), the income from the monthly payments is basically used in the purchase of first necessity consumer goods, like food, household and personal hygiene products, clothing and footwear. Thus, some of the basic necessities are attended, but there will not have enough left over for job seeking. Therefore, this program is not life changing. The initial push, the resources received at the beginning of one's professional life that can be invested and spent as wished, is still missing. If the monthly income permits a short-term consumption increase, the stakeholding permits long-term planning of the future.

The monthly income plan can raise doubts about productivity reduction due to less work incentive, even in the negative income tax format. Stakeholder grants increase the economy's efficiency owing to the fact that the marginal value of £1 for the poor is greater than for the rich, and the former will strive more to obtain a greater return from the money received.

The Stakeholder Grants program is a way of enhancing work opportunities. Although monthly income helps reduce inequality, it can not be considered an instrument to improve the economy's efficiency. According to Celso Furtado (1992, p. 52), when discussing economic development, the examples from other countries show that social homogenization is a necessary condition, but it is not enough to defeat underdevelopment.

The Basic Income program is safer for the citizen. On the other hand, the Stakeholder Grants program's security can be increased with several measures. As soon as the children can read, they are capable of understanding the program. The money is deposited every year and the beneficiaries receive monthly statements showing the balance and the amount of interest received. They will be educated about how to handle the capital when they reach adulthood. During three years, between the ages of 18 and 21, the young adults receive the interest over the capital, a monthly income, and will be surrounded by people to evaluate how

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[7] Interest rates for consumers in Brazil reaches 170 percent per year.

the money is being spent. The whole process, from birth to adulthood, will help the young people to become mature when they finally receive the grant. The parents and the school will insist that the money is to be responsibly used, and those that spend it in an irresponsible manner will at least be an example for the others. With these procedures, the Stakeholder Grants program's safety is surely increased.

The Stakeholder Grants program is less paternalistic and gives the citizen more freedom and greater possibilities. However, it is not immune to mistakes that lead to the loss of the amount received. We can then wonder whether these people will end up in the same situation they were before receiving the money, or even worst, as their neighbors, due to the grant, will be able to enjoy opportunities that they can't, besides being frustrated while their neighbors enjoy things they can't have. The answer is no. Everyone gains. In the first place, those who lost their grant managed to finish high school, which they would not have done otherwise. The additional schooling years make them better prepared for the labor market, leading to additional income. Secondly, the environment, meaning friends and family, has more capital; some may have set up a successful business and now need help in expanding it, hence increasing work opportunities for others. Thirdly, the country's economy, *ceteri paribus*, is growing faster due to the reduction of inequality and social exclusion resulting from the Stakeholder Grants program, which will create more opportunities for those that lost the initial grant. Consequently, even those people who lost the initial allowance will be better off than if the program had not been implemented.

According to Ackerman and Alstott (2006, p. 58), it is not fair to deny freedom to everyone just because some will abuse this freedom. Therefore, it is not fair to refuse opportunities to the whole nation due to the failure risk of a few. Presently, the young underprivileged Brazilians have little incentive to study in light of the low expectation for the future. The labor market, with high unemployment, low salaries and bad working conditions, is very discouraging.

As a result of the Stakeholder Grants' policy, the transition from adolescence to adulthood becomes very important because then the beneficiary will receive a monthly income, followed later by the principal. At this moment in life, there will be a change in expectancy which, based on the economic principle of performance influenced by expectation, will benefit everyone. The capital injection into the market will raise the business' prospects as to aggregate demand, which will affect production and employment levels.

Social justice policies are compared to public health policies by Le Grand and Nissan (2003), and can be divided into curative and preventive. Curative policies are based on income distribution set by the market and try to lessen the differences, balancing social justice and economic efficiency. These policies first permit poverty and inequality to invade the social structure, and the initial existing differences to accentuate, and then lessen the symptoms by fiscal measures, wealth or income taxation and periodical transfer of money to the poor. The preventive policies aim at reducing the chances of the social structure developing disorders like poverty, inequality and exclusion. These policies intervene directly in the initial distribution of resources by the market, reducing inequality of working opportunities. Both authors confirm that the curative policies are not only less efficient in reducing poverty, inequality and exclusion, but also more difficult to be politically defended.

Many people believe that the poor do not deserve to be helped by the government, because they see poverty as a result of lack of will power, performance or ambition. However, the underprivileged themselves may feel that a monthly allowance is a sign of incapability. The objective of the prevention policies is to improve distribution by using each one's human and financial capital. In this manner, it is more efficient to reduce poverty, inequality and exclusion through education up to high school and a lump-sum allowance. Improving wealth distribution at the beginning of adulthood means not only reducing opportunity inequality but also increasing the incentive for working and seeking capital accumulation[8].

According to the report from the 2003 Policy Research Initiative, an institute that conducts research in support of the Government of Canada's agenda, asset distribution is the missing piece in solving poverty problems. Income alone is not enough for a person's stability and long-term life planning. The income that comes from these programs is basically used for short-term consumption, while assets can permit long-term objectives, which is a step in the right direction in the war against poverty. Asset acquisition must not, in the short-term, substitute the income supplement policies, but must complement them. These policies represent the new way people think, emphasizing mutual responsibility and focusing on equal opportunities and long-term resource distribution, which is more adequate than income distribution at a specific moment of time (PRI, 2003, p. 2).

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[8] According to Le Grand and Nissan (2003, p. 31): "we believe that the relative failure of existing measures to reverse or even prevent the growth of poverty and inequality comes not only from their own weakness but also from their failure to tackle a fundamental cause of inequality in our society: the unequal distribution of wealth, or, more specifically, the unequal distribution of receipts of wealth".

Microsimulation Model Methodology

The implementation simulation technique used for both policies is called microanalytical simulation model, also know as microsimulation model[9]. With this tool it is possible to construct economic models by altering the attributes of the micro units, i.e., each individual unit attribute that feeds the database with economic and social-demographic characteristics of the population. After each alteration, which can be either deterministic or stochastic, it is possible to once again analyze the database and obtain the aggregated results of this new population. This research is concerned about projecting variables related to poverty and income distribution, as well as inequality indicators.

Although in the 1950s these computer resources were limited, Orcutt (1957) discussed the limitation of the economic modeling with aggregated data and suggested analyzing changes in a population by simulating alterations in individual units. In this way, changes in hypotheses are tested according to the peculiarities of each individual because each one will respond in a different way to alterations in the macroeconomic and social environment. Thus, it is possible to quantify with a set vector of characteristics the foreseen model alterations for each population unit and therefore create a new database that permits accurate calculations of the resulting aggregated variables of these simulated alterations. This model can be either static, where the change results can be analyzed in a particular time frame, or dynamic, where the evolution can be measured over a period of time and the cumulative results can be simulated for each population characteristic. In this way, the econometric model micro-unit simulation in large databases is an improved method to evaluate *ex-ante* the results of a public policy to be implemented.

The Brazilian Household Survey (PNAD) contains the economic and social-demographic characteristics that are necessary for the implementation simulation of the discussed policies in a particular moment of time and, if complemented by the IBGE demographic projections[10], permits the analysis of the programs' long-term results.

Suplicy's Basic Income plan, which is part of his book "Renda Básica de Cidadania: A Resposta dada pelo Vento" ("Citizenship's Basic Income: The Answer is Blowing in the Wind"), in which each Brazilian citizen receives R$ 40.00 per month, is used in this research's simulation. It is, therefore, a universal policy, as opposed to Bolsa Família (the Brazilian government family allowance program), that only benefits low income families. The database used is the 2005 PNAD. The developed simulation assumes that the implementation

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[9] Refer to Mitton (2000) and Bourguignon (2005) for details on microsimulation.
[10] Refer to Oliveira (2004) for demographic projections.

of the Basic Income plan occurs without the suspension of the Bolsa Família program, as the latter's benefits are included in the 2005 PNAD. In this way, all Brazilians will have an income increase of R$ 40.00; those that already received Bolsa Família will not lose the benefit.

The implementation of the Basic Income program costs R$ 88.8 billion yearly, which represents 12 monthly installments of R$ 40.00 for 185 million Brazilians. The total amount represents a little over 4% of the 2006 GNP, which is R$ 2,147 billion. This research is neither concerned about the funding of the program, that is exposed in Suplicy (2006), nor with income reduction for the rich which would occur in the case of a progressive tax system for inequality reduction. In this simulation, the rich and the poor receive the same R$ 40.00 income supplement.

This research develops a static simulation to measure the completion of the Basic Income program for 2005, with no time progression. The R$ 88.8 billion resource injection into the economy will increase consumption, stimulate the productive sector and generate jobs. Therefore, the poverty and inequality reduction results of the following years may be greater than these. However, it would be necessary to develop econometric models that assess the program's impact on the behavior of the population and different economic sectors in order to evaluate all the program's long-term benefits. This is not the research's objective.

Due to the fact that Stakeholder Grants is a long-term program that brings about gradual changes in the population's education and income level, the simulation is dynamic and examines the results from its theoretical beginning, 2008, until 2080. The annual deposit is of R$ 790 for each Brazilian child born after 2008. The same amount is deposited on the day of the child's birthday until the last deposit at the age of 18. The first step, therefore, is to determine how many children will be born each year, and consequently the total amount of the required expense.

It is necessary to know how many children will be born in 2008. For the year 2009, how many will be born and how many will be one year old, as not all children born in 2008 will survive their first birthday. In 2010, how many will be born, how many will be one year old and how many will be two years old, and so on successively. Table 2 presents these numbers until 2050, using the projection by IBGE. Table 2 also presents the total annual amount. It is assumed that all children born alive will receive the grant and that, in case of death, the total amount will be available for the child or youngster's heirs, i.e., parents, siblings or spouse.

Table 2 – Expense Projection – 2008 to 2050

Year	Population	Population 0 - 18 years old	Number of Deposits	Expense Projection (R$ million)
2008	191,869,683	3,654,187	3,654,187	2,886.81
2009	194,370,095	3,639,890	7,276,654	5,748.56
2010	196,834,086	3,634,350	10,874,245	8,590.65
2011	199,254,414	3,631,109	14,442,811	11,409.82
2012	201,625,492	3,628,702	17,978,426	14,202.96
2013	203,950,099	3,627,124	21,484,793	16,972.99
2014	206,230,807	3,626,110	24,965,361	19,722.64
2015	208,468,035	3,625,128	28,421,054	22,452.63
2016	210,663,930	3,624,173	31,855,638	25,165.95
2017	212,820,814	3,623,244	35,273,093	27,865.74
2018	214,941,017	3,622,358	38,676,292	30,554.27
2019	217,025,858	3,621,517	42,066,862	33,232.82
2020	219,077,729	3,620,707	45,447,253	35,903.33
2021	221,098,714	3,619,926	48,820,624	38,568.29
2022	223,089,661	3,619,170	52,189,054	41,229.35
2023	225,050,475	3,617,531	55,551,901	43,886.00
2024	226,979,194	3,615,032	58,906,945	46,536.49
2025	228,873,717	3,612,603	62,252,946	49,179.83
2026	230,731,063	3,610,242	65,588,889	51,815.22
2027	232,547,226	3,594,757	65,304,812	51,590.80
2028	234,321,464	3,576,475	65,026,475	51,370.92
2029	236,052,867	3,551,521	64,756,514	51,157.65
2030	237,737,676	3,521,712	64,498,479	50,953.80
2031	239,371,493	3,494,564	64,254,504	50,761.06
2032	240,949,947	3,470,145	64,019,272	50,575.22
2033	242,469,695	3,446,466	63,787,259	50,391.93
2034	243,928,059	3,426,520	63,555,540	50,208.88
2036	246,652,529	3,397,347	63,071,941	49,826.83
2037	247,922,296	3,385,642	62,819,517	49,627.42
2038	249,139,880	3,376,245	62,567,530	49,428.35
2039	250,305,051	3,369,988	62,313,459	49,227.63
2040	251,418,006	3,365,830	62,054,166	49,022.79
2041	252,478,134	3,361,876	61,787,666	48,812.26
2042	253,484,968	3,356,490	61,514,019	48,596.08
2043	254,439,554	3,349,662	61,235,042	48,375.68
2044	255,343,363	3,341,742	60,952,535	48,152.50
2045	256,198,374	3,331,761	60,667,857	47,927.61
2046	257,005,525	3,321,785	60,383,073	47,702.63
2047	257,765,281	3,311,625	60,097,988	47,477.41
2048	258,478,808	3,298,301	59,812,483	47,251.86
2049	259,146,835	3,282,349	59,529,278	47,028.13
2050	259,769,964	3,263,806	59,250,429	46,807.84

Source: Author's calculations

This table demonstrates that the amount of R$ 2,886.81 million is required for 2008. This amount increases to R$ 51,815.22 million in 2026, when all Brazilians between the ages of 0 and 18 will be benefiting from the program. It decreases after 2026 since there is a reduction in the number of children born every year. In 2050, the last year of the projection, the total expense will be of R$ 46,807.84 million. It is assumed here that the Brazilian fertility rate will not increase, and in fact may decrease in the underprivileged classes because, as seen in Table 1, the fertility rate is inversely proportional to income and, according to the same information sources used in table 1, to schooling.

In order to calculate the balance and return of each account after 2026, it is necessary to project the interest rate as of 2008. To make an exact long-term projection, four different scenarios were taken into consideration. In the first scenario, the same present average actual interest rate was considered for the whole period of time, estimated at 10% per year[11]. In the second situation, a rate of 8% is used, because it is assumed that the 10% rate is very high and causes demands from the society to be lowered. In the third projection, the rate is 6% per year, as it is believed that there will be a reduction in the interest rate. The fourth scenario projects a gradual actual interest rate reduction. Between the years of 2008 and 2012, the interest rate is 10% per year, then 8% per year between 2013 and 2020, and then 6% per year after that.

The monthly income and the principal that each 21-year-old young adult is entitled to vary according to the scenario. The first group of children born in 2008 will receive the monthly deposits between the years of 2026 and 2028, and the principal in 2029. Those born in 2009 will receive the monthly deposits between 2027 and 2029, and the principal in 2030, and so on. Mathematical finance can project the monthly yield for each scenario. In scenario 1, each youth will receive a R$ 226.80 monthly income between the ages of 18 and 20, and R$ 40,415.68 at the age of 21. In scenario 2, the beneficiary will receive monthly deposits of R$ 218.28 between the ages of 18 and 20, and then R$ 32,742.55 at 21. Scenario 3 presents a monthly yield of R$ 133.35 and a lump-sum of R$ 26,670.39. In scenario 4, due to the variable interest rates, the amounts are not constant. In this case, the child born in 2008 will receive R$ 150.47 between 2026 and 2028 and R$ 30,093.47 in 2029, at the age of 21. The amount gradually declines until those born in 2020, who will receive R$ 133.35 between 2038

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[11] The Brazilian government bonds *(Global 40)*, issued internationally in 2006 with final maturity date in 2040, offer an interest rate of 11% per year. The actual interest rate for these bonds is determined by this rate plus the variation in its face value *(coupon)*.

and 2040 and then R\$ 26,670.39 in 2041. As of 2020, when the interest rates become constant at 6% per year, scenario 4 behaves like scenario 3, with the same values.

The first step in this simulation is to calculate the income increase due to education. At this stage, although it is assumed that the number of youngsters that will not graduate from high school is insignificant, the income increase is not considered as a result of the grant, but as a result of the increase in school years. Mincerian equation is used to estimate the relation between accumulated investments as a result of human capital and income. In this way, the basic equation is as follows:

$$\ln(\text{income}) = \alpha.\text{schooling} + \beta.X + v,$$

where the napierian logarithm of income is a function of years of formal education (schooling) and of a vector of perceptible characteristics X, which can change or not with time, like age and gender, plus a group of non perceptible characteristics, v, part of which includes personal characteristics (fixed) that reflect heterogeneity and uncertainty such as skills and luck[12], plus an error term.

The regression that relates income, a dependent variable, and schooling considers age, squared age, gender and ethnicity. Mincer's (1974) initial proposal is to use experience as schooling, which is not considered by PNAD. Therefore, age is considered as *proxy* of experience. Squared age represents the parabolic behavior of this variable given that income, up to a point, increases with age and then tends to decline. If this hypothesis is correct, the squared age coefficient must be negative. Gender and ethnicity are also important elements in the study of income, and were hence included as control variables. There are many other factors that influence income, like living-region, migration, family composition, marital status, and others. As the regression that considers the former variables already permitted a squared-r of 0.43 and literature regards the other factors as secondary, they were not included in this research. However, they may be included in the future. The regression is as follows:

$$\ln(\text{income}) = \alpha_0 + \alpha_1\text{schooling} + \alpha_2\text{age} + \alpha_3\text{age}^2 + \alpha_4\text{gender} + \alpha_5\text{ethnicity} + v$$

where gender =1 if masculine and ethnicity = 1 if white or Asian, zero otherwise in both cases.

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[12] Refer to Cunha and Hechman (2006) for specifics on these non perceptible characteristics, including the statistical decomposition between heterogeneity and uncertainty.

The result is:

```
      Source |       SS           df       MS                 Number of obs =99374841
-------------+------------------------------               F(5,99374835) =        .
       Model |   48189062.2        5   9637812.44            Prob > F      =   0.0000
    Residual |  63048252.499374835  .634448876              R-squared     =   0.4332
-------------+------------------------------               Adj R-squared =   0.4332
       Total |   11123731599374840  1.11937101              Root MSE      =  .79652


------------------------------------------------------------------------------
       lninc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      school |   .1289432   .0000194   6631.14   0.000     .1289051    .1289813
         age |   .0666591   .0000222   3004.33   0.000     .0666156    .0667026
        age2 |  -.0004532   2.36e-07  -1917.44   0.000    -.0004536   -.0004527
      gender |   .5121048   .0001611   3179.16   0.000     .5117891    .5124206
       ethni |   .2233853   .0001663   1343.43   0.000     .2230594    .2237112
       _cons |   2.983018   .0005083   5868.31   0.000     2.982021    2.984014
------------------------------------------------------------------------------
```

All variables are statistically significant in explaining income. Squared age has a negative coefficient proving the hypothesis that income increases with age up to a point, and then declines. The maximum point occurs when the first derivative is zero:

$$\frac{\partial y}{\partial age} = \alpha_2 + 2\alpha_3 age, \text{ and, } \alpha_2 + 2\alpha_3 age = 0$$

so, $age = \dfrac{-\alpha_2}{2\alpha_3}$; therefore, approximately 73 years

Table 3 below presents the relation between schooling (years of formal education) and income. This relation is not strictly monotonic due in part to the concentration of answers on complete schooling periods.

Table 3 – Income versus Schooling

Schooling	0	1	2	3	4	5	6	7
Income (R$)	353.96	386.53	409.82	438.82	563.31	501.59	487.17	511.03

Schooling	8	9	10	11	12	13	14	15+
Income (R$)	664.86	511.56	586.32	900.19	1,171.99	1,353.78	1,540.87	2,885.50

Source: Author's calculations based on 2005 PNAD

These numbers permit income simulation by schooling increase with the use of the following equation:

$$Income = e^{(2,983018+0,1289432\,schooling+0,0666591\,age-0,0004532\,age^2+0,5121048\,gender+0,2233853\,ethnicity)}$$

It was considered that in each simulated moment of time, 2030, 2040, 2050 and 2080, society would reproduce the 2005 PNAD survey in relation to schooling increase, calculated above, and income, foreseen by the Stakeholder Grants program, and simulated in each described scenario. The other society characteristics were considered as constant. This research can be expanded by simulating other alternatives with the use of demographic and econometric models.

For the group of following simulations, a dynamic model was used, with the division of the population in groups along a time line. In relation to the first group, youngsters born between 2008 and 2017, it was assumed that 1/3 of them will almost immediately lose the grant received, 1/3 will leave the money in the same savings account and will continue receiving the same interest rate they had been receiving since the age of 18, and the rest will invest the money. These investments can vary from the purchasing of a house in order to avoid paying rent to the starting of a small business, or even to the creation of partnerships for joint investments. Few will achieve results that are superior to financial investments. In this conservative simulation, it is assumed that the average return for these investments is 50% inferior to the interest rate from a financial application. In this way, the first group as a whole will receive return which is equal to 50% of the interest rate which they received between the ages of 18 and 20.

Those born between 2018 and 2027 are part of the next group. Now it is assumed that society has had some sort of financial education and the investment results have improved. The elder sibling, who lost the grant, will be an example to the younger one, as well as to cousins and neighbors. This behavior change means that the next group will have an average return after the age of 21 equal to 60% of the interest rate. This learning curve increases with the average investment result for the next group being 70% of the interest rate, and so on. The groups after the one made up of children between 2058 and 2067 will have the same average return rate as a financial application.

Stakeholder Grants results are simulated for 2030, 2040, 2050 and 2080. The objective is to measure *ceteri paribus* the policy's results. It is not assumed that an eventual enhance in income distribution is the result of economy growth, nor that other governmental programs are implemented during this period, not even Basic Income. The inequality reduction that has been observed since 1990 is also disregarded. Although these improvements may in fact

enhance the results obtained by the Stakeholder Grants program, the simulation only assesses the results of the proposed public policy, affected by the grant and increase in schooling.

This study analyzes the gradual implementation of Stakeholder Grants, with medium and long-term results. However, with political support, the program can be reconsidered to include the youngsters that are now finishing middle school. This way, they would have access to the benefits as soon as they finish high school and the program's results would be evident only three years after its approval.

Results of the Implementation of Basic Income and Stakeholder Grants in Brazil

The results of the implementation of the Basic Income program are positive. The Gini coefficient, that measures economic inequality, would suffer a reduction, in the first year of the program, of 4.77%, going from 0.552 to 0.525. In order to assess the coefficient's strength, it is important to remember that in Brazil this coefficient declined by 2.59% between 2003 and 2005 and by 6.16% between 1993 and 2003. The efficiency of the Basic Income program proposed by Suplicy (2006) can also be measured by another figure: 10% of underprivileged Brazilians increased by 50% their share in the national income, from .88% to 1.31%.

Tables 4 and 5 present, respectively, the country's inequality measured by the Gini coefficient and regional variations. The figures in Table 4 represent the actual inequality measured by PNAD each year for 1993, 2003 and 2005, as well as the implementation simulation for the Basic Income and Stakeholder Grants programs.

According to these tables, there is a greater reduction of the Gini coefficient in the Northeast region, from 0.551 to 0.509, a 7.59% decline. There is better income distribution in all regions and all states of the country. Even where the Bolsa Família program is not very efficient, Basic Income presents good results. For example, in the Mid-West region the inequality reduction between 2003 and 2005 was of 0.71%. With Professor Suplicy's program, the reduction is of 4.15% in this region. In some states, like Rio Grande do Norte, Paraíba and Goiás, where inequality increased during this period even with the Bolsa Família program, a reduction will occur with the implementation of Basic Income. It is important to stress that the results comparison in the North region between 2003 and 2005 is not as accurate as those of other regions because IBGE enlarged the household research area in 2004. This research opted for keeping the 2005 complete results, which are based on a different area in relation to 2003.

Table 4 – Gini Coefficient – Individuals

Region State	PNAD 1993	PNAD 2003	PNAD 2005	Basic Income	Stakeholder Grants
Brasil	0.60343	0.56627	0.55161	0.52532	0.35575
North Region	0.58538	0.53409	0.50909	0.47839	0.31526
Rondônia	0.55985	0.51169	0.54726	0.52048	0.32843
Acre	0.55682	0.59503	0.54672	0.51488	0.33753
Amazonas	0.54203	0.50464	0.45942	0.43344	0.29300
Roraima	0.53497	0.54055	0.51014	0.47800	0.31264
Para	0.60974	0.52364	0.50184	0.46925	0.30243
Amapá	0.63691	0.55245	0.51414	0.48898	0.33720
Tocantins	0.54875	0.57136	0.54993	0.51159	0.37822
Northeast Region	0.61917	0.57021	0.55095	0.50913	0.32470
Maranhão	0.63844	0.55224	0.51139	0.46396	0.30418
Piauí	0.58378	0.62677	0.58910	0.54055	0.32288
Ceará	0.61056	0.56974	0.56575	0.52047	0.33519
Rio Grande do Norte	0.57902	0.55064	0.58533	0.54849	0.36043
Paraíba	0.63834	0.56088	0.56921	0.52873	0.34443
Pernambuco	0.60816	0.56244	0.56047	0.52121	0.32863
Alagoas	0.59149	0.58108	0.52366	0.48188	0.29882
Sergipe	0.63958	0.56766	0.54063	0.50306	0.32726
Bahia	0.62586	0.57008	0.52740	0.48756	0.31357
Southeast Region	0.58131	0.54317	0.53385	0.51231	0.36784
Minas Gerais	0.58869	0.54264	0.52843	0.50016	0.33831
Espírito Santo	0.57550	0.54795	0.54027	0.51462	0.34676
Rio de Janeiro	0.57709	0.53903	0.53215	0.51209	0.36906
São Paulo	0.56616	0.53100	0.52433	0.50518	0.37887
South Region	0.57702	0.53505	0.51928	0.49728	0.34620
Paraná	0.59261	0.55279	0.53841	0.51518	0.36352
Santa Catarina	0.53463	0.50056	0.48338	0.46407	0.32509
Rio Grande do Sul	0.58109	0.53583	0.51977	0.49739	0.34112
Mid-West Region	0.61699	0.56837	0.56431	0.54090	0.38043
Mato Grosso do Sul	0.58068	0.54398	0.52526	0.49953	0.34667
Mato Grosso	0.57896	0.52666	0.49763	0.47406	0.32411
Goiás	0.61063	0.52795	0.54692	0.52039	0.35157
Distrito Federal	0.62059	0.59921	0.59247	0.57752	0.48070

Source: Author's calculations based on PNAD

Table 5 – Gini Coefficient Variation – Individuals

Region				
State			**Basic Income**	**Stake Grant**
	2003/1993	**2005/2003**	**/2005**	**/2005**
Brasil	-6.16%	-2.59%	-4.77%	-35.51%
North Region	-8.76%	-4.68%	-6.03%	-38.07%
Rondônia	-8.60%	6.95%	-4.89%	-39.99%
Acre	6.86%	-8.12%	-5.82%	-38.26%
Amazonas	-6.90%	-8.96%	-5.65%	-36.22%
Roraima	1.04%	-5.63%	-6.30%	-38.71%
Para	-14.12%	-4.16%	-6.49%	-39.74%
Amapá	-13.26%	-6.93%	-4.89%	-34.41%
Tocantins	4.12%	-3.75%	-6.97%	-31.22%
Northeast Region	-7.91%	-3.38%	-7.59%	-41.07%
Maranhão	-13.50%	-7.40%	-9.27%	-40.52%
Piauí	7.36%	-6.01%	-8.24%	-45.19%
Ceará	-6.69%	-0.70%	-8.00%	-40.75%
Rio Grande do Norte	-4.90%	6.30%	-6.29%	-38.42%
Paraíba	-12.13%	1.49%	-7.11%	-39.49%
Pernambuco	-7.52%	-0.35%	-7.00%	-41.37%
Alagoas	-1.76%	-9.88%	-7.98%	-42.94%
Sergipe	-11.24%	-4.76%	-6.95%	-39.47%
Bahia	-8.91%	-7.49%	-7.55%	-40.54%
Southeast Region	-6.56%	-1.72%	-4.03%	-31.10%
Minas Gerais	-7.82%	-2.62%	-5.35%	-35.98%
Espírito Santo	-4.79%	-1.40%	-4.75%	-35.82%
Rio de Janeiro	-6.60%	-1.28%	-3.77%	-30.65%
São Paulo	-6.21%	-1.26%	-3.65%	-27.74%
South Region	-7.27%	-2.95%	-4.24%	-33.33%
Paraná	-6.72%	-2.60%	-4.31%	-32.48%
Santa Catarina	-6.37%	-3.43%	-3.99%	-32.75%
Rio Grande do Sul	-7.79%	-3.00%	-4.31%	-34.37%
Mid-West Region	-7.88%	-0.71%	-4.15%	-32.58%
Mato Grosso do Sul	-6.32%	-3.44%	-4.90%	-34.00%
Mato Grosso	-9.03%	-5.51%	-4.74%	-34.87%
Goiás	-13.54%	3.59%	-4.85%	-35.72%
Distrito Federal	-3.45%	-1.12%	-2.52%	-18.87%

Source: Author's calculations based on PNAD

Table 6 shows national income distribution in each decile of the Brazilian population. As stated before, with the implementation of the Basic Income program 10% of the poorest population increases its participation of the income from 0.88% to 1.31%, almost 50%. With the Basic Income plan, the poorest half of the population, i.e., the first five deciles, increases its participation of the national income from 15.79% (total of the first five groups) to 17.42%, representing an increase of more than 10%. The same table shows that the Stakeholder Grants program would increase the participation of the first decile, representing the poorest tenth part of the Brazilian population, from 0.88% to 2.33%, almost trebling this participation (2,65 times, to be more exact). For the first five deciles, representing half the Brazilian poor population, the Stakeholder Grants program would elevate the income participation from 15.79% to 26.74%, almost a 70% increase.

Table 6 – Group Participation in Income

Decil	PNAD 2005	Basic Income	Stakeholder Grants
1	0.88%	1.31%	2.33%
2	2.61%	2.97%	4.54%
3	3.75%	4.05%	5.63%
4	3.80%	4.09%	6.60%
5	4.75%	5.00%	7.64%
6	5.95%	6.14%	8.79%
7	7.50%	7.62%	10.06%
8	10.06%	10.05%	11.77%
9	15.38%	15.13%	14.40%
10	45.32%	43.64%	28.24%
Total	100.00%	100.00%	100.00%

Source: Author's calculations based on PNAD

As to poverty reduction, the 2005 PNAD demonstrates that after the implementation of the Bolsa Família plan, approximately 4.5% of the Brazilian population was still below the extreme poverty threshold[13], while 10.5% was below the poverty threshold.

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[13] There are many poverty measurement methods, and this research does not aim to discuss them. The definition used is the one proposed by the World Bank, which is that extreme poverty is when people live with less that 1 dollar per day and poverty, with 2 dollars. Although this definition is criticized, it was used here due to its simplicity. It is important to stress that this paper's interest is to present the magnitude of the econometric study's tendencies, and the relative results would be the same regardless of the figures used for poverty and extreme poverty thresholds.

Table 7– Inequality Evolution – Scenario 4

Region	Gini Coefficient					Reduction
State	2080	2050	2040	2030	2025	from 25/80
Brasil	0.35575	0.44855	0.49528	0.53476	0.55207	35.6%
North Region	0.31526	0.38572	0.43851	0.48885	0.50930	38.1%
Rondônia	0.32843	0.42379	0.48951	0.53125	0.54729	40.0%
Acre	0.33753	0.42167	0.47557	0.52892	0.54815	38.4%
Amazonas	0.29300	0.35318	0.40332	0.44484	0.45974	36.3%
Roraima	0.31264	0.38132	0.43726	0.48445	0.51051	38.8%
Para	0.30243	0.36822	0.42016	0.47866	0.50182	39.7%
Amapá	0.33720	0.40553	0.45726	0.49595	0.51430	34.4%
Tocantins	0.37822	0.45100	0.48925	0.52967	0.55021	31.3%
Northeast Region	0.32470	0.41619	0.47074	0.52669	0.55120	41.1%
Maranhão	0.30418	0.37715	0.42148	0.48137	0.51181	40.6%
Piauí	0.32288	0.42915	0.49425	0.55848	0.58907	45.2%
Ceará	0.33519	0.42946	0.48854	0.54249	0.56615	40.8%
Rio Grande do Norte	0.36043	0.45116	0.50636	0.56346	0.58543	38.4%
Paraíba	0.34443	0.43509	0.49286	0.54703	0.56939	39.5%
Pernambuco	0.32863	0.42828	0.48498	0.53958	0.56070	41.4%
Alagoas	0.29882	0.39099	0.44542	0.50307	0.52362	42.9%
Sergipe	0.32726	0.41710	0.46982	0.51922	0.54153	39.6%
Bahia	0.31357	0.39984	0.44939	0.50321	0.52753	40.6%
Southeast Region	0.36784	0.45646	0.49369	0.52151	0.53418	31.1%
Minas Gerais	0.33831	0.43122	0.47393	0.51077	0.52857	36.0%
Espírito Santo	0.34676	0.44451	0.48667	0.52461	0.54077	35.9%
Rio de Janeiro	0.36906	0.46638	0.49965	0.52233	0.53237	30.7%
São Paulo	0.37887	0.45767	0.49115	0.51427	0.52471	27.8%
South Region	0.34620	0.43845	0.47969	0.50694	0.52010	33.4%
Paraná	0.36352	0.45408	0.49824	0.52618	0.53970	32.6%
Santa Catarina	0.32509	0.40563	0.44688	0.47281	0.48414	32.9%
Rio Grande do Sul	0.34112	0.44100	0.47941	0.50640	0.52008	34.4%
Mid-West Region	0.38043	0.47491	0.51964	0.55051	0.56466	32.6%
Mato Grosso do Sul	0.34667	0.43148	0.47575	0.50859	0.52562	34.0%
Mato Grosso	0.32411	0.40594	0.45308	0.48502	0.49778	34.9%
Goiás	0.35157	0.44949	0.49534	0.53108	0.54719	35.7%
Distrito Federal	0.48070	0.54478	0.56978	0.58454	0.59251	18.9%

Source: Author's calculations based on PNAD

With the implementation of Basic Income together with Bolsa Família, the percentage of families with a *per capita* household income below the extreme poverty threshold would be reduced to less than 2%, while 8% would be below the poverty threshold. This means that 4.6 million Brazilians would be taken out of extreme poverty and another 4.6 million from poverty, besides those already benefited from Bolsa Família.

Table 7 demonstrates the Gini coefficient for 2025, with the same geographical division adopted by the prior table, which uses the 2005 PNAD as a measure base for the

experiment, and for 2030, 2040, 2050 and 2080 the simulated PNADs for each individual per year. The inequality reduction estimate for Brazil, measured by the Gini coefficient, is from 0.55207 for 2025 to 0.35575 in 2080. According to calculations by the World Bank Chief Economist François Bourguignon, presented in Cogneau (2003, p.2), Brazil has an elasticity of poverty reduction of 10, in relation to the Gini coefficient. Therefore, a decrease of 5% of the Gini coefficient times elasticity of 10 is equal to a poverty reduction of 50%. In this way, when the Stakeholder Grants program proposes a 35% Gini coefficient reduction, it means eliminating structural poverty, even considering that this elasticity tends to fall with the reduction of the Gini coefficient.

Conclusions

The simulation demonstrates that, in Brazil and under the proposed conditions, the Stakeholder Grants program is more efficient and cheaper than the Basic Income program to reduce inequality and poverty. However, the effects are long-term, while Basic Income's results are immediate.

Therefore, in order to minimize the present problems produced by inequality, the Basic Income plan should be immediately implemented. Nevertheless, this program alone is neither capable of eliminating endemic poverty nor interrupting the intergeneration transmission of inequality in Brazil.

Thus, in order to build a more just and better country in future, it is important that the Stakeholder Grants policy also be implemented. This future can, in fact, be anticipated since the Stakeholder Grants program can be implemented for the young that are now in middle school, hence permitting earlier results.

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