Targeting the Poor: A Macroeconomic Analysis of Cash Transfer Programs*

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Abstract

This paper introduces cash transfers targeting the poor in a model with idiosyncratic risk and incomplete markets. By changing the degree of insurance in the economy, the government affects precautionary motives, leading the poorest households to decrease labor supply and savings proportionally more than the richest households. In a model economy calibrated to Brazil, once the cash transfer program is adopted, income inequality remains about the same, wealth inequality increases, poverty decreases, employment decreases by a tiny amount and social welfare increases.

Keywords: incomplete markets, cash transfer programs, precautionary savings.

JEL Classification: D31, E21, H31.

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1 Introduction

Conditional cash transfer programs (CCTPs) have been spreading throughout the developing world for the last years.[1] Almost every country in Latin America has such a program. In its original conception, a CCTP makes cash payments to poor families provided that they comply with some conditions regarding investments in their children, such as schooling or health. In addition, in some countries such as Brazil and Mexico, CCTPs cover millions of families and, thus, also play an important role in improving the social protection system.

Policy discussion has focused on two main objectives of CCTPs: enhancing human capital among poor children and developing a better social safety net. The two different objectives lead to different emphasis on the program implementation. The first implies attention to the conditions, while the second implies attention to the scope of transfers. This paper is concerned with the implications of a program focused solely on improving the social safety net. Hence, we overlook the role of the conditions and study how targeted transfers, by changing the degree of insurance in the economy, affect social welfare.

In particular, we introduce cash transfers targeting the poor in a model that follows in the tradition of Imrohoroglu [1989], Huggett [1993] and Aiyagari [1994]. In other words, in our model there is a continuum of heterogeneous households facing an uninsured idiosyncratic risk regarding their endowment of efficient labor units.[2] Households cannot borrow. Thus, in order to smooth consumption, they can supply an indivisible unit of labor and accumulate savings over time. Families can save through risk-free bonds and fiat money. We departure from the previous literature by assuming that, whenever a family decides to hold risk-free bonds, it must pay a fixed fee broadly interpreted as the pecuniary cost to access financial services. This way, we capture the feature of incomplete financial access on developing economies.

We model the cash transfer program (CTP) as a fixed amount of transfer given to any

[1] See Fiszbein and Schady [2009] for a comprehensive discussion about CCTPs.

[2] In this paper, families and households make up a single unit. Henceforth, we use both terms interchangeably.

household whose income is below an established threshold. The government funds these transfers with a fixed budget assigned exogenously every period.

Generally, transfers can be used by the government to alter the degree of insurance in the economy. In particular, CTPs provide a valuable source of insurance for those families that are at risk of being borrowing constrained and, thus, have stronger precautionary motives than wealthier families. Once the CTP is adopted, the government affects precautionary motives in an asymmetric way, leading the poorest households to decrease labor supply and savings proportionally more than the richest households. Hence, it is a theoretical possibility that CTPs increase inequality and poverty.

In addition, there are three other reasons in this model that rationalize CTPs increasing inequality and poverty. First, leisure is a normal good and, thus, the poorest households reduce labor supply once in the program. Second, households can reduce labor supply or allocate savings to fiat money in order to become eligible for the program. Finally, indivisible labor supply may amplify the three effects mentioned before, since modeling extensive margin has been shown to substantially increase labor supply elasticities.

In a model economy calibrated to Brazil, once the CTP is introduced, income inequality remains about the same, wealth inequality increases, poverty decreases, employment decreases by a tiny amount and, more importantly, social welfare increases relative to an economy in which the budget of the program is distributed lump-sum to all households. In particular, consumption needs to increase by 1.2 percent for all households in the later economy such that social welfare measures are equalized across economies.

Once we set the fixed fee to access financial services equal to zero, such that every household is connected to the financial sector, the welfare gains from implementing the CTP fall by 50 percent. Intuitively, if there is a fixed cost to access financial services, those households that are at risk of being borrowing constrained have extra motives to save but a worse mechanism – fiat money – to transfer wealth over time. Hence, the kind of insurance provided by CTPs is more valuable when financial markets do not function well.

We also study an alternative policy that not only implements targeted transfers, but also stimulates employment. In particular, if the household works and its income is less than an established threshold, its income is complemented up to this threshold level of income. If the household does not work, it is not eligible for the program. The threshold level of income is chosen such that total transfers is equal to the budget previously assigned to the CTP.

This alternative policy dominates the CTP in all social dimensions considered, except wealth inequality. By providing incentives for households to work, this alternative policy narrows the coverage of the program, transferring more cash on average to less households. Consequently, income inequality and poverty decrease.

The reason why wealth inequality increases is intrinsically related to the fact that social welfare increases. This alternative policy improves social welfare because it essentially provides a better insurance arrangement for the households in the economy. Therefore, precautionary motives weaken, leading the poorest households to reduce savings proportionally more than wealthier households. As a consequence, wealth inequality increases.

There is a vast literature studying different aspects of taxation and redistribution in this kind of environment. A novelty of this paper is that it allows targeted transfers to the poor and focus on the recent developing economies experience. In an example of recent related paper, Oh and Reis [2011] evaluate how the increase in targeted transfers during the 2007-9 great recession affected output, consumption and employment in the U.S. The authors take up the positive task of understanding the transition dynamics of the economies that use transfers expansions as a counter-cyclical policy. In contrast with Oh and Reis [2011], this paper has a normative perspective, studying the role of targeted transfers in improving social outcomes by changing the degree of insurance in the economy. The aim is to isolate the effect of such mechanism in a model with uninsured risk and incomplete markets.

Two other papers are also closely related to ours. Castaneda et al. [2003], while evaluating the effects of changes in estate taxes, find that modeling US social security allows the model to replicate the pattern of low savings among the poor and old households. Alonso-Ortiz and

Rogerson [forthcoming] claim that different taxes and transfers programs have large effect on labor supply. Our approach is different from these papers because we focus on (i) the effects of introducing programs that target to decrease poverty and; (ii) on the experience of developing economies where imperfect access to financial markets can be a serious issue.

Others focused on the trade-off between efficiency and inequality associated with distortionary taxes schedule. Flodén and Lindé [2001] estimate wage profiles for the US and Sweden, calculate optimal distortionary taxes schedule and compare the optimal policy in these two economies. Cagetti and Nardi [2009] evaluate the effects of state taxes on wealth accumulation in a OLG economy. [3] This paper abstracts from the efficiency-equality trade-off to focus on the macroeconomic effects of target transfers, given a budget exogenously fixed.

We recognize, however, that a more complete model – that accounts for intra-household heterogeneity, fertility decisions and human capital formation – is needed to evaluate other effects of CCTPs, such as implications to growth and demographics as well as additional effects on welfare, inequality, poverty and employment.

2 Cash transfer programs in Brazil

The *Bolsa Família* (family allowance) program is a large scale CCTP in Brazil.[4] Its origin dates back to 1996, when the national government developed a CCTP for families whose children are likely to work in risky occupations. Before 2003, many CCTPs had been developed at the national and local levels. The most important was the *Bolsa Escola* (school allowance) program, created in 2001 to transfer cash to families whose income per capita is below an established threshold provided that their children receive a minimal level of schooling.

In 2003, the Bolsa Família program was created to unify four national CCTPs, including the Bolsa Escola program. Previously, different programs were implemented by different

[3] An incomplete list on this literature branch encompasses Domeij and Heathcote [2004], Heathcote [2005], Meh [2005], Conesa and Krueger [2006], Kitao [2008], and Conesa et al. [2009].

[4] The description of the program is based on Soares and Sátyro [2009].

government agencies with little coordination among them. The coverage was not national and it varied with the program. Hence, similar families receive different benefits. The creation of a unified program aimed to correct for these discrepancies.

In 2006, the Bolsa Família program reached 11 million families and its budget was 0.35 percent of the GDP.[5] These figures did not change much up to 2009.

In contrast with other social policies, such as unemployment insurance, the budget assigned to the Bolsa Família program is fixed. Once this budget is exhausted, no more beneficiaries can be included in even if they are eligible for the program. Hence, implementing the program requires planning in advance. In particular, if horizontal equity is a concern, the eligibility requirements and the size of the transfer should be consistent with the assigned budget.[6]

A family is eligible to be in the program if the household income per capita is below one of two poverty lines. If income per capita is below the extreme poverty line, the family receives a fixed transfer plus a variable amount depending on the number of children. If income per capita is above the extreme poverty line but below the other poverty line, the family only receives a variable amount depending on the number of children. The rules and benefits have changed for the last few years. In 2006, for instance, every family whose income per capita is below R$50 – around US$36 in 2006 Purchasing Power Parity (PPP)[7] – is eligible to get a fixed benefit of R$50. Every family whose income per capita is below R$100 (US$72 PPP) gets an extra of R$15.00 (US$11 PPP) per children – up to three of them – that are below 14 years old. These values have been adjusted periodically. After 2008, the families may also get extra payments if composed by teenagers that are between 15 and 18 years old.

In order to obtain the benefit, the families should comply with some schooling and health conditions for their children. The monitoring of compliance with these conditions has been

[5] Using the 2006 *Pesquisa Nacional por Amostra de Domicílios*, an annual cross-sectional household data survey, Soares and Sátyro [2009] estimate that 16.8 percent of all families were in the program, and its budget represented only 0.69 percent of the total income of all families.

[6] In practice, Soares and Sátyro [2009] report that in 2006, 8.3 percent of all families is not eligible for the program but receives the benefits, whereas 6.6 percent is eligible but does not receive the benefits.

[7] The PPP conversion rate is obtained at the International Monetary Fund website.

a controversial point of the program.

On one hand, it has been argued that the conditions are more important than the transfers. According to this view, the Bolsa Família program is an important tool to enhance human capital formation among poor children. On the other hand, another view claims that the Bolsa Família program should be concerned in improving the social safety net and, thus, the scope of transfers should be the primary focus. If the conditions are excessive, for instance, the most vulnerable families are not able to comply with them.

In comparison with the international experience, the Bolsa Família program stands in between these views.[8] At the same time that the monitoring of compliance with the conditions has been improving since 2006, the penalties imposed for violations are light. Fiszbein and Schady [2009] argue that the Bolsa Família program, in contrast with the Mexican CCTP, "puts a shade more emphasis on redistribution than on human capital formation".

Finally, the Bolsa Família program has been criticized on two grounds. First, the program induces people to quit their jobs in order to be eligible for the program or to enjoy more leisure time.[9] Second, the program influences in a perverse way the political process – a dimension that warrants special attention in Latin America given its populist tradition. Indeed, many political scientists argue that the Bolsa Família program fits into a patron-client political machine used to guarantee that those supported by the patron are elected.[10]

In this paper, we address some of these points in a quantitative framework that incorporates some of the Bolsa Família program characteristics, such as coverage, eligibility and fixed budget. However, since the framework abstracts from fertility, we overlook the conditions of the program. Nonetheless, our modeling strategy fits the view that CCTPs' primary focus should be on improving the social safety net. In particular, our study evaluates the effect of cash transfer programs on income inequality, wealth inequality, poverty rates, employment

[8] See Fiszbein and Schady [2009] for a comparison of CCTPs across countries.

[9] Foguel and de Barros [2010] do not find empirical evidence supporting this claim, but Ribas and Soares [2010] argue that the Bolsa Família program reduces employment in large cities.

[10] Manacorda et al. [forthcoming] and Zucco [2011] show that beneficiaries from CCTPs in Uruguay and Brazil, respectively, are more likely to favor the incumbent government.

and social welfare.

3 Model

The model follows in the tradition of Imrohoroglu [1989], Huggett [1993] and Aiyagari [1994].[11] The aim is to study redistribution in a context that households' connection to the financial sector is not granted. The redistribution policy, for instance, is a CTP that targets those in the bottom of the income distribution.

3.1 The Private Sector

3.1.1 Demographics and endowments

There is a continuum with unit mass of infinitely lived, ex-ante identical households. Each household faces an uninsured idiosyncratic stochastic process that determines the value of their endowment of efficient labor units ε. We assume that this process is independent and identically distributed across households and that it follows a finite state Markov chain with transition probabilities given by $\pi(\varepsilon', \varepsilon) = \Pr\{\varepsilon_{t+1} = \varepsilon' | \varepsilon_t = \varepsilon\}$, where ε and $\varepsilon' \in E \equiv \{\varepsilon^1, \varepsilon^2, ..., \varepsilon^{N-1}, \varepsilon^N\}$.

3.1.2 Preferences

Preferences are described by

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[\log c_t - \theta n_t\right],$$

where $\beta \in (0, 1)$ is the time discount factor, $c_t \geq 0$ is consumption, and $n_t \in \{0, 1\}$ is labor. We follow Chang and Kim [2007] and assume that labor is indivisible.[12] Hence, there is no loss of generality in assuming a linear disutility from working.

[11] See Heathcote et al. [2009] for a recent survey.

[12] As Alonso-Ortiz and Rogerson [forthcoming] point out, "because coordination problems within organizations often restrict the ability of individuals to work significantly different hours than their coworkers, we believe that the indivisible assumption is an appropriate one in contexts that stress idiosyncratic cross-section heterogeneity."

3.1.3 Production technology

There is a representative firm that produces with a Cobb-Douglas function, $Y_t = K_t^{\alpha} H_t^{1-\alpha}$, $\alpha \in (0, 1)$, where K_t is capital and H_t is the aggregate efficient labor units.

3.2 Market arrangements

There are no insurance markets for the idiosyncratic shock so households self-insure themselves by accumulating wealth. The market structure that allows such accumulation departs in three aspects from standard papers in the literature.

First, we assume that households can save through risk-free bonds b_t that yield an interest rate of r, and through fiat money m_t that depreciates at an inflation rate of π. Households cannot borrow – that is, $b_t \geq 0$. If a household chooses to hold a positive amount of risk-free bonds, it must pay a fixed fee ξ broadly interpreted as a pecuniary cost to access financial services.

In many developing countries, the poorest families have limited access to banks; thus, holding fiat money over time is an important tool to smooth consumption for them. In contrast, the richest households usually have full access to a variety of financial services. Introducing a fixed cost to hold bonds is a shortcut to preserve this discrepancy without changing the main features of the model.[13]

Second, since CTPs have been widely implemented in developing economies, such as Brazil or Indonesia,[14] we assume a small, open competitive economy without migration. Hence, the interest rate r is fixed, determined in the international capital market, but the wage rate w_t clears the national labor market.

Finally, we assume that the decision on how much to save $a_t = b_t + m_t$ is taken before the shock ε_t is realized, but the decision on how to allocate the wealth a_t between money

[13] In Imrohoroglu [1989], agents can hold fiat money but not risk-free bonds; thus, fiat money is the only way to accumulate wealth. In Erosa and Ventura [2002], since credit is costly, agents hold money to perform transactions. Both papers study the welfare cost of inflation in an incomplete market model with heterogeneous agents.

[14] See Fiszbein and Schady [2009] for a list.

m_t and bonds b_t is taken after the realization of the shock. This timing protocol reduces the state space of the economy and, thus, facilitates its computational implementation. It can be rationalized as follows: b_t is the balance in a liquid savings account held in a commercial bank and ξ is a maintenance fee needed to keep this account open during the period. Consequently, households can change their portfolio decisions in the very beginning of the period without incurring any cost.

3.3 The government sector

We model the CTP as a threshold level of income $\bar{y}$ and a fixed amount of transfer T, such that every household with total income $rb_t + n_t\varepsilon_t w_t$ smaller than $\bar{y}$ receives T. Moreover, total transfers must be less or equal than the budget B, which is assigned exogenously every period.

More specifically, B is a costless endowment that the government has every period. It can either transfer B to poor households, distribute it lump-sum to all households, or even throw it away.[15] This paper is concerned about the contrast between cash transfers targeting the poor and the other two possible policies. Importantly, it is not concerned about the efficiency-equity trade-off, so we do not model explicitly the tax instruments used to fund B. Since B is calibrated to be a very small fraction of total income, the distortions imposed on the economy to raise B should not be of primary importance. Alternatively, if funding the budget is a concern, imposing a linear tax rate τ on labor income is tantamount to redefining the efficient labor units space, and let the endowment process absorb the taxes necessary to raise B.[16]

[15] Alternatively, if the government spent B on a public good that enters utility additively, the positive implications of the last policy would not change, although welfare characterizations would be affected.

[16] Mathematically, let $E \equiv \{(1-\tau)\tilde{\varepsilon}^1, (1-\tau)\tilde{\varepsilon}^2, ..., (1-\tau)\tilde{\varepsilon}^{N-1}, (1-\tau)\tilde{\varepsilon}^N\}$. In this case, $\tilde{\varepsilon}$ is the true shock and $\varepsilon = (1-\tau)\tilde{\varepsilon}$ is interpreted as the the shock adjusted for taxes.

3.4 Equilibrium

Assume a_t takes value on a large compact set $A \subset \mathbb{R}_+$. The aggregate state of the economy is a measure of households λ_t defined over an appropriate family of subsets of $A \times E$. The individual states are the realization of the idiosyncratic shock ε_t and the stock of wealth a_t. We are interested in the properties of a stationary equilibrium in which the measure of households remains invariant.

3.4.1 Household problem

Recall that the savings decision is taken before the realization of the idiosyncratic shock, but the portfolio decision on how to allocate savings between money and bonds is taken after. Let $\mathbf{I}$ denote the indicator function. The household problem is written recursively.

$$
\begin{aligned}
& V(a,\varepsilon) = \max_{c,n,m,b,a'} \left\{ \log c - \theta n + \beta \sum_{\varepsilon' \in E} V(a',\varepsilon')\pi(\varepsilon',\varepsilon) \right\} \\
& \text{s. t.} \\
& c + a' = (1+r)b + (1-\pi)m + w\varepsilon n + \mathbf{I}_{\{y \le \overline{y}\}} T - \mathbf{I}_{\{b>0\}}\xi \\
& a = b + m \\
& y = rb + w\varepsilon n \\
& c \ge 0; n \in \{0,1\}; b \ge 0; m \ge 0; a' \ge 0.
\end{aligned}
$$

Notice that the allocation of wealth a can take only three forms: (1) $b = 0$ and $m = a$; (2) $b = a$ and $m = 0$; or (3) $b = (\overline{y} - w\varepsilon n)/r$ and $m = a - b$. In words, if the household does not pay the fixed cost ξ, it holds only fiat money. If it pays ξ, since bonds dominate money in returns, the household either only holds risk-free bonds or also holds enough money in order to be eligible for the program.

3.4.2 Definition

A stationary recursive competitive equilibrium is a value function $V : A \times E \to \mathbb{R}$; policies for the household $a' : A \times E \to \mathbb{R}_+$, $c : A \times E \to \mathbb{R}_+$, $n : A \times E \to \{0, 1\}$, $b : A \times E \to \mathbb{R}_+$ and $m : A \times E \to \mathbb{R}_+$; policies for the firm K and H; prices r and w; government policies T and $\bar{y}$; and a measure λ defined over an appropriate family of subsets of $A \times E$ such that:

1. Given prices and government policies, the policies for the household solve the household problem and V is the associated value function;

2. Given prices and government policies, the policies for the firm solve the firm problem – that is, $\max_{K,H}\{K^\alpha H^\alpha - (r + \delta)K - wH\}$;

3. Labor market clears – that is, $\int_{A\times E} n(a, \varepsilon)\varepsilon d\lambda(a, \varepsilon) = H$;

4. Government budget balances – that is, $T \int_{A\times E} \mathbf{I}_{\{y(a,\varepsilon)\leq\bar{y}\}} d\lambda(a, \varepsilon) = B$;

5. λ is an invariant probability measure.[17]

3.4.3 Welfare

The heterogeneous agents model with incomplete markets has been widely used to evaluate the extent of welfare gains from different redistribution policies. Flodén and Lindé [2001] and Alonso-Ortiz and Rogerson [forthcoming], for example, study the welfare implications of different tax policies needed to fund lump-sum transfers. Our approach is closely related to theirs.

Let the equilibrium objects be indexed by the CTP $\bar{y}$.[18] In order to evaluate the welfare

[17] That is, for all $\mathcal{A} \times \mathcal{E}$ in an appropriate family of subsets of $A \times E$, the invariant probability measure satisfies $\lambda(\mathcal{A} \times \mathcal{E}) = \int_{A\times E} \sum_{\varepsilon'\in\mathcal{E}} \mathbf{I}_{\{a'(a,\varepsilon)\in\mathcal{A}\}} \pi(\varepsilon', \varepsilon) d\lambda(a, \varepsilon)$.

[18] Given that B is fixed, T is determined endogenously by the government budget constraint. Analogously, we can specify T and determine $\bar{y}$ endogenously.

implications of the program, we specify the following utilitarian social welfare function:[19]

$$W(\bar{y}) = \int_{A\times E} V(a,\varepsilon;\bar{y})d\lambda(a,\varepsilon;\bar{y}).$$

Consider two different CTPs, $\bar{y}$ and $\bar{y}'$. The stationary change in welfare, Δ, associated with a change from $\bar{y}$ to $\bar{y}'$ is defined by the proportional change in consumption for all households that would be required to equalize the welfare measures, $W(\bar{y})$ and $W(\bar{y}')$; that is, Δ solves:

$$\begin{aligned} & \frac{1}{1-\beta}\int_{A\times E}\left[\log(c(a,\varepsilon;\bar{y})) - \theta n(a,\varepsilon;\bar{y})\right] d\lambda(a,\varepsilon;\bar{y}) = \\ = \; & \frac{1}{1-\beta}\int_{A\times E}\left[\log((1+\Delta)c(a,\varepsilon;\bar{y}')) - \theta n(a,\varepsilon;\bar{y}')\right] d\lambda(a,\varepsilon;\bar{y}'). \end{aligned}$$

Notice that a negative value of Δ indicates a welfare gain and a positive value of Δ indicates a welfare loss from adopting the policy $\bar{y}'$. Finally, in contrast with Flodén [2001] and Heathcote [2005], this measure abstracts from transition dynamics.

4 Quantitative analysis

This section assesses quantitatively the equilibrium effects of a CTP on income inequality, wealth inequality, poverty, employment and social welfare.

The algorithm used to solve numerically for the stationary recursive equilibrium is standard. We use value function iterations to solve the household problem and the algorithm suggested by Ríos-Rull [1999] to find the invariant distribution λ.[20]

[19] See Kaplow [2008] for a defense of such social welfare function as a guide to evaluate and compare different redistributive policies.

[20] The asset space A is discretized using 1601 grids unequally distributed in $[0, 305]$. The invariant distribution λ was approximated by tracking a sample of 30,000 constructed households over time.

4.1 Calibration

The time horizon is one year. We focus on the period before 2007 to rule out possible influences that the 2007-9 great recession might had on the key variables we are interested in.

The Markov process $\pi(\varepsilon', \varepsilon)$ follows from an approximation of an AR(1) process in logs:[21]

$$\log(\varepsilon') = \rho \log(\varepsilon) + u, \text{ where } u \sim N(0, \sigma^2).$$

In Brazil, due to the lack of a household panel data survey, such as the Panel Study of Income Dynamics in the U.S., we cannot estimate ρ and σ^2 properly. As an alternative strategy, we fix $\rho = 0.96$ based on evidence for the U.S. economy,[22] but adjust σ^2 to match the Gini coefficient in Brazil. This coefficient is calculated using the 2006 *Pesquisa Nacional por Amostra de Domicílios* (PNAD) – an annual cross-sectional household data survey.[23] We find $\sigma^2 = 0.074$, which is higher than the numbers commonly used in the literature for the U.S. economy. Intuitively, more variability is necessary to match a higher degree of income inequality in Brazil.

We set α, δ and β to generate the share of capital income, the capital to output ratio and the consumption to output ratio observed in the data. These figures are calculated using the national accounts by Pereira and Ferreira [forthcoming]. We calibrate θ to replicate the participation rate of families in the labor market.[24] This number is calculated using the 2006

[21] In particular, we apply Tauchen [1986]'s algorithm with 21 grids.

[22] The literature estimates this process to be very persistent. Flodén and Lindé [2001], for example, estimate $\rho = 0.91$, whereas French [2005] estimates $\rho = 0.98$.

[23] In order to make model and data comparable, we measure household income as income per members of the family. Moreover, we consider all families with positive income and all sources of income. We do not believe that the sample or sources of income should be restricted in order to make model and data comparable. The model is rich enough to allow multiple interpretations. Retirement, for example, can be interpreted as a bad idiosyncratic shock. Hence, moving from a bad shock to a good one can be think of a new generation substituting the old retired one and bequeathing its assets. Along these lines, since social security systems tend to crowd out private savings, not accounting for these sources of income might introduce a discrepancy between the model and the data.

[24] We assume that a household is participating in the labor market if its head or the head's spouse is employed.

PNAD.

Consider the financial sector. Both r and π are set to 4 percent, which is the 2005-6 annual average of both the rate of return to savings in savings account deposits and the inflation rate measured by the consumer price index. We calibrate ξ to generate the fraction of households connected to the financial sector. We proxy this figure by the number of people that hold at least one savings account deposit divided by the adult population in 2006.[25] This figure can be biased as one household can have multiple accounts or even a more sophisticated time, instead of savings, account deposit. We do not have enough data to inspect the sign and the size of the bias. Since the Brazilian government is implementing policies to facilitate access to financial services, we also generate results for $\xi = 0$ meaning that all households are connected to the financial sector.

Finally, we set T and $\bar{y}$ to replicate the Bolsa Família program coverage – 16.8 percent in 2006 – and the program budget as a share of total income – 0.69 percent in 2006. These figures are calculated using the PNAD and are reported in Soares et al. [2009]. Since the model displays discontinuities, we are not able to match the exact coverage of the program.

Table 4.1 summarizes this information.

[25]The number of people that hold at least one savings account deposit is obtained at the Brazilian Central Bank website. Also, the adult population is the number of people that are more than 15 years old.

parameter	target	model	data	
$\rho = 0.96$	persistence of shocks	0.96	0.96	
$\sigma^2 = 0.074$	Gini coefficient	0.560	0.560	
$\alpha = 0.4$	capital share	0.4	0.4	
$\delta = 0.093$	capital/GDP	3	3	
$\beta = 0.94$	consumption/GDP	0.79	0.78	Benchmark
$\theta = 0.62$	% households employed	0.81	0.82	
$\xi = 0.046$	% households connected	0.54	0.55	
$r = 0.04$	rate savings	0.04	0.04	
$\pi = 0.04$	inflation rate	0.04	0.04	
$T = 0.093$	program budget (% income)	0.0069	0.0069	
$\bar{y} = 0.4$	program coverage	0.184	0.168	

calibration vs. targeted data

4.2 External validation

Since we are investigating the interactions between cash transfer programs, poverty and inequality, it is desirable that the benchmark calibration replicates other dimensions of poverty and inequality in Brazil.

Table 1 reports the share of labor income across quintile in the model under the benchmark calibration and calculated in the data using the 2006 PNAD. Since we target the Gini coefficient for total income, it is not clear whether the model would be able to replicate the degree of earnings inequality in the data. Nonetheless, the model performs reasonably well in matching it.

Brazil lacks a household survey that properly accounts for wealth measurement, such as the Survey of Consumer Finances in the U.S. However, using information from other countries and regression methods, Davies et al. [2008] input for Brazil a Gini coefficient for wealth of 0.783 in 2000. The model does a reasonable job in matching this number. Indeed,

Earnings quintile	earnings share data (PNAD)	earnings share model
First	0.4%	0.0%
Second	4.6%	4.3%
Third	10.0%	10.7%
Fourth	19.0%	21.8%
Fifth	66.0%	63.2%

Table 1: Earnings distribution across earnings quintile.

under the benchmark calibration, the equilibrium Gini coefficient for wealth – measured by a – is 0.763.[26]

For the sake of completeness, Table 2 reports the share of earnings and wealth across wealth quintile, although we cannot validate them due to the lack of data. Nonetheless, it provides an educated guess on the actual wealth distribution in Brazil.

Wealth quintile	earnings share model	wealth share model
First	8.9%	0.0%
Second	9.0%	0.0%
Third	16.3%	3.2%
Fourth	24.9%	18.0%
Fifth	41.0%	78.7%

Table 2: Wealth and earnings distribution across wealth quintile.

It has been noted in the literature that this class of models does not perform well in accounting for the shares of earnings and of wealth in both tails of the corresponding distributions.[27] However, from the perspective of understanding the role of transfers targeting the poor, we do not believe that explaining the very wealthy is of primary importance.

Table 3 shows the percentage of households living in both extreme poverty and poverty. Notice that $\bar{y} = 0.4$ (or R$100.00 in a month) is the poverty line that separates those that are in the program from those that are not, so 0.2 (or R$50.00 in a month) is the extreme

[26]To be precise, in 2000, cash transfers targeting the poor in Brazil were not so widespread as it has been recently. As the next section shows, if the program were abolished, the Gini coefficient for wealth would fall to 0.753.

[27]See, for example, Castaneda et al. [2003], who improves the explanation of inequality at the top by introducing a very high realization of earnings which occurs with a very small probability.

poverty line. We use these numbers to calculate the poverty rates reported in Table 3. The model does a good job in matching the poverty rate, but underestimates the extreme poverty rate.

	model	data (PNAD)
% households in extreme poverty	1.9%	3.9%
% households in poverty	12.4%	11.4%

Table 3: Poverty rates.

The average income, including transfers, is 2.47 (in a year) in the model economy and approximately R$600 (US$431 PPP in a month) in the data according to the 2006 PNAD. Hence, the threshold level of income represents 16.2 percent of the average income in the model economy and 16.7 percent in the data. In the actual economy, the budget per family in the program was R$686 (US$492 PPP) in 2006.[28] In the model economy, $T = 0.093$ is equivalent to R$271 (US$195 PPP) in a year. Hence, the model economy would be consistent with the actual one if families have on average 2.5 members, but this figure is actually 3.2 according to the 2006 PNAD.

Nonetheless, despite the model overlooks some characteristics of the Bolsa Família program, such as multiple threshold levels of income, it does a good job in replicating key dimensions of the distribution of income and poverty in the data. Hence, we believe that this framework provides a good guidance to study the impact of CTPs on income inequality, wealth inequality, poverty, employment and social welfare.

4.3 Results

In contrast with complete market economies, the key economic mechanism present in this class of models is precautionary motives as a consumption smoothing mechanism. As Pijoan-Mas [2006] shows, if the idiosyncratic risk cannot be fully insured, aggregate wealth and labor

[28] This figure is calculated dividing the budget of the program by the number of families in the program, both obtained at the *Matriz de Informação Social* website at http://aplicacoes.mds.gov.br/sagi/mi2007/home/index.php.

supply are higher for self-insurance reasons than their complete market counterparts.

Transfers that target the poor change the degree of insurance available in the economy. In particular, they weaken precautionary motives that are stronger for those households that are at risk of being borrowing constrained. As a consequence, they decrease savings and labor supply proportionally more than richer and wealthier households. This asymmetric response of savings and labor supply across households is the main driving force behind the results below.

Tables 4 and 5 provide the main results in this paper. Tables 4 shows the effects of abolishing the program. We consider two counterfactual experiments. The third column eliminates the program by distributing the budget B lump-sum to all households, whereas the fourth eliminates the program by throwing the budget B away.

	benchmark	no program	no program
coverage	18.4%	100%	0%
consumption/GDP	79.5%	80.1%	79.8%
% households employed	80.7%	81.3%	81.3%
% households connected	53.5%	54.6%	55.9%
Gini coefficient	0.560	0.560	0.563
Gini coefficient for wealth	0.763	0.753	0.749
% households in extreme poverty	1.9%	4.3%	4.4%
% households in poverty	12.4%	16.5%	16.5%
Δ		1.2%	2.6%

Table 4: Results.

Table 5 repeats the same experiments for economies in which access to the financial sector is granted – that is, $\xi = 0$. This exercise allows us to understand better the role that the fixed cost ξ – a non-standard assumption in the literature – is playing in the model. We do not change other parameters and, thus, the budget B is slightly different across economies. Therefore, the comparison across tables is not straightforward. Nonetheless, in Section 4.4, we show that funding the government budget B with lump-sum taxes collected from all households does not change much the conclusions in the following subsections.

In the next subsections, we discuss these results bearing in mind the discussion that

coverage:	benchmark 19.4%	no program 100%	no program 0%
consumption/GDP	81.5%	82.4%	81.9%
% households employed	78.3%	79.6%	79.8%
Gini coefficient	0.561	0.558	0.561
Gini coefficient for wealth	0.730	0.716	0.713
% households in extreme poverty	2.5%	4.6%	4.7%
% households in poverty	13.4%	15.3%	16.0%
Δ		0.6%	2.1%

Table 5: Results. $\xi = 0$.

followed in Section 2. We are interested in the following questions: (1) Does the CTP reduce inequality?; (2) Does it reduce poverty?; (3) Does it decrease employment?; (4) Does it increase social welfare?

4.3.1 Does the CTP reduce inequality?

There are four theoretical reasons in this model that rationalize CTPs increasing income inequality. First, leisure is a normal good and, thus, the poorest households reduce labor supply once in the program. Second, households can reduce labor supply or allocate savings to fiat money in order to become eligible for the program. Third, due to precautionary motives, once the CTP is introduced, the poorest households save and supply labor proportionally less. Finally, indivisible labor supply may amplify the three effects mentioned before.

If the program were abolished and its budget were distributed lump-sum to all households (Table 4, third column), the Gini coefficient would remain about the same. But if the budget of the program were thrown away (Table 4, fourth column), the Gini coefficient would increase by 0.003.

In contrast, the Gini coefficient for wealth decreases in both scenarios. Consider distributing the budget B lump-sum to all households (Table 4, third column). Hence, the coefficient would fall by one point. Notice that under the CTP, households in the first and second wealth quintile do not hold savings (Table 2 in Section 4.2). In fact, once the program

is adopted, the increase in wealth concentration follows from the third and fourth quintile holding a smaller share of wealth, whereas the fifth holds a larger share.[29]

Finally, Table 5 provides an example showing that the CTP can increase income inequality. Indeed, once every household is connected to the financial sector, the CTP increases the Gini coefficient by 0.003 in comparison with the case in which the budget is distributed lump-sum to all households (Table 5, third column).

Empirical evidence: According to our preferred experiment (Table 4, third column), the Bolsa Família program does not impact the Gini coefficient. This results contrasts with the empirical literature that stresses the role of the program in reducing inequality. Soares et al. [2009], for instance, documents that the Bolsa Família program accounts for 20 percent of the fall in the Gini coefficient from 2004 to 2006.[30] Many of the studies in de Barros et al. [2007b] corroborates this finding to some extent. de Barros et al. [2007a], for example, reports that CCTPs account for 12 percent of the decrease in the Gini coefficient from 2001 to 2005.[31] However, most of these results are based on accounting exercises that ignore the endogenous response of labor and financial income to the program.

Moreover, we believe there are large measurement errors in income derived from financial assets for two reasons. First, the PNAD aggregates interests and dividends with other sources of income in the same cell. Hence, interests and dividends cannot be disentangled properly from other sources of income. Second, it is likely that during the interview some households miscalculate, or even ignore, the value of their income derived from financial assets. Therefore, if savings respond strongly to the program, even if some empirical exercises properly account for the endogenous changes in labor and financial income, the role of CTP in reducing inequality tend to be overestimated. To make that point properly, we calculate the Gini coefficient imposing zero financial income to every household in the model. In fact,

[29] Distributing B lump-sum to all households implies that the third, fourth and fifth quintile hold 3.7 percent, 19.1 percent and 77.2 percent of total wealth, respectively.

[30] The Gini coefficient had fallen from 0.569 in 2004 to 0.560 in 2006.

[31] The Gini coefficient had fallen from 0.593 in 2001 to 0.566 in 2005.

once the CTP is adopted, this coefficient falls from 0.613 to 0.610.

It is also plausible that precautionary motives are stronger in the model than in the data.[32] In any case, our results call for a better empirical understanding of the response of income derived from financial assets to the Bolsa Família program.

4.3.2 Does the CTP reduce poverty?

The same reasons that explain CTPs increasing inequality can also explain them increasing poverty.

Notice that targeting the transfers to the poor is very effective in reducing poverty. Once the CTP is introduced, the overall poverty rate decreases by 4.1 percentage points and the extreme poverty rate decreases by 2.4 percentage points (Table 4, third column). These figures would be similar if the budget B were thrown away (Table 4, fourth column). Finally, if $\xi = 0$, poverty rates fall but by smaller magnitudes than before (Table 5, third and fourth columns).

Empirical evidence: According to our preferred experiment (Table 4, third column), the Bolsa Família program implies a reduction of 55.8 percent in extreme poverty and 24.8 percent in overall poverty.

The finding that CTPs is effective to reduce poverty is consistent with many studies for Latin America,[33] despite some of them ignore the endogenous response of labor and financial income to the program. In contrast, Ravallion [2009] argues that targeting poor households was not effective to reduce poverty in China.

[32] See Carroll and Kimball [2008] for a survey on precautionary wealth. The authors conclude that "establishing the intensity of the precautionary saving motive and the magnitude of precautionary wealth remain lively areas of debate."

[33] See, for example, Fiszbein and Schady [2009] for Latin America and Soares et al. [2006] for Brazil.

4.3.3 Does the CTP decrease employment?

In both experiments in Table 4, once the CTP is adopted, the participation rate falls by 0.6 percentage points. This figure represents 3.3 percent of those households in the program. This number is smaller than its counterpart in the economy with full connection to the financial sector represented in Table 5. Indeed, if $\xi = 0$, the participation rate falls by 1.3 or 1.5 percentage points, depending on the scenario, once the program is adopted.

Intuitively, once precautionary motives are weakened and, thus, the need to self-insure is smaller, households reduce both their labor supply and savings. The better the savings mechanism, the more labor supply adjust for precautionary motives. Since fiat money is a worse mechanism to transfer wealth across time than risk-free bonds, labor supply adjusts more for precautionary reasons when full access to the financial sector is granted.

Empirical evidence: According to our preferred experiment (Table 4, third column), the Bolsa Família program induces only 0.6 percent of households to quit their jobs, a decrease of 0.75 percent in the participation rate.

Most empirical studies on developing countries do not find that CCTPs reduce significantly the participation rate.[34] A tiny decrease of 0.75 percent in the participation rate is statically consistent with some of these studies.

4.3.4 Does the CTP increase social welfare?

If access to financial market is not granted, as in Table 4, the Bolsa Família program enhances welfare. Indeed, in order to equalize welfare measures across economies, consumption has to increase by 1.2 percent for all households in the economy in which the budget B is distributed lump-sum to all households.[35] Once there is full-access to financial services, as in Table 5,

[34] See Fiszbein and Schady [2009] and the references therein. For studies considering the Bolsa Família program, see Foguel and de Barros [2010] and Ribas and Soares [2010]. Ribas and Soares [2010], for instance, find a significant reduction in labor supply in metropolitan areas.

[35] Since throwing the budget B away instead of distributing it among households tend to reduce welfare, we do not discuss this experiment in this section.

$\Delta = 0.6$ percent; thus, the welfare gains decrease by 50 percent.

Intuitively, CTPs change the degree of insurance in the economy. If there is a fixed cost to access banks, those households that are at risk of being borrowing constrained have extra motives to save but a worse mechanism – fiat money – to transfer wealth over time. Hence, the kind of insurance provided by the CTP is more valuable when financial markets do not function well.

Finally, since the Bolsa Família program increases social welfare from an utilitarian perspective, our results do not support the case that its implementation is necessarily politically motivated.

4.4 Robustness: funding the budget

We assume that the budget B is assigned exogenously to the government. Therefore, the economies represented in Tables 4 and 5 imply different budgets and, thus, the comparison across tables is not straightforward. In this section, we check robustness by assuming that the budget is funded with lump-sum taxes B collected from all households. Table 6 displays the results. In order to calculate the Gini coefficient and the poverty rates, we consider disposable income.

	program	no program	program $\xi = 0$	no program $\xi = 0$
coverage:	18.3%	100%	19.2%	100%
consumption/GDP	79.0%	79.8%	81.0%	81.9%
% households employed	80.8%	81.3%	78.6%	79.8%
% households connected	53.9%	55.9%	100%	100%
Gini coefficient	0.563	0.563	0.564	0.561
Gini coefficient for wealth	0.761	0.749	0.728	0.713
% households in extreme poverty	3.0%	4.4%	3.5%	4.7%
% households in poverty	12.5%	16.5%	13.6%	16.0%
Δ		1.1%		0.6%

Table 6: Robustness.

Qualitatively, all the implications stated above are robust to funding the budget with lump-sum taxes. Intuitively, the size of the budget is relatively small in both economies.

Thus, the introduction of lump-sump taxes to fund the budget does not change the overall picture.

Quantitatively, however, there are minor differences. In particular, the extreme poverty rate falls by a smaller amount than before and the Gini coefficient is higher for income but smaller for wealth. Intuitively, by taxing all households in a lump-sum fashion, the government not only affects directly the poverty rates and the distribution of disposable income, but also affects indirectly the degree of insurance provided for those that are close to being borrowing constrained.

4.5 Alternative policy

In this section, we evaluate a welfare program whose objective is also to stimulate labor supply.[36] At the same time, in order to improve the social protection system, this alternative program must provide a valuable source of insurance for those households that are at risk of being borrowing constrained.

The following alternative policy is consistent with these two objectives. If the household works and its total income is less than an established threshold $\bar{y}$, its income is complemented up to $\bar{y}$. If the household does not work, it is not eligible for the program. Hence, the household budget constraint is rewritten as

$$c + a' = b + (1 - \pi)m + w\varepsilon n + \max\{rb + w\varepsilon n, n\bar{y}\} - \mathbf{I}_{\{b>0\}}\xi.$$

We choose $\bar{y}$ such that total transfers is equal to the budget B previously assigned to the CTP. Mathematically,

$$\int_{A\times E} n(a,\varepsilon)\max\{\bar{y} - rb(a,\varepsilon) - w\varepsilon, 0\}d\lambda(a,\varepsilon) = B.$$

[36] We are partially inspired by the design of the Earned Income Tax Credit program in the U.S., in which a special attention is devoted to work incentive effects. See Moffitt [2002] for a survey on the relationship between welfare programs in the U.S. and labor supply.

Therefore, the implications of both policies are comparable.

Figure 1 compares the design of both programs. It plots disposable income against income. The left plot represents the CTP, whereas the right plot represents the alternative program.[37]

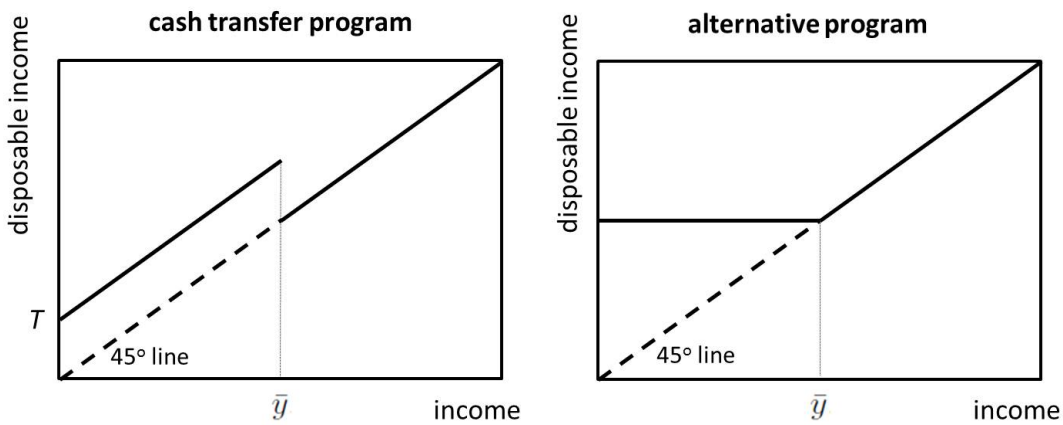

Figure 1: Cash transfer program vs. alternative program

Table 7 reports the results. The second and third columns compare the CTP with the alternative policy when access to the financial services is costly, whereas the fourth and fifth columns compare both policies when $\xi = 0$. In comparison with the CTP, employment increases, income inequality decreases, wealth inequality increases, both poverty rates decrease and social welfare increases. Notably, the participation rate increases by 2.1 percentage points (or 3.0 percentage points if $\xi = 0$) and the overall poverty rate falls by 8.9 percentage points (or 9.1 percentage points if $\xi = 0$).

This alternative policy dominates the CTP in all social dimensions considered, except wealth inequality. By providing incentives for households to supply indivisible labor, this alternative policy narrows the coverage of the program, transferring more cash on average to less households. Consequently, income inequality and poverty rates decrease.[38]

[37] It should be kept in mind that the transfer schedule implied by the right plot is conditional on labor income being positive, otherwise the curve depicted simply overlaps with the 45-degree line.

[38] If connection to the financial sector is not granted, the threshold level of income that clears the budget is $\bar{y} = 0.40$, which is precisely the figure that determines the poverty line. In the economy with $\xi = 0$, the threshold level of income is $\bar{y} = 0.41$.

	program benchmark	alt. policy	program ($\xi = 0$)	alt. policy ($\xi = 0$)
coverage:	18.4%	13.4%	19.4%	12.9%
consumption/GDP	79.5%	79.3%	81.5%	81.2%
% households employed	80.7%	82.8%	78.3%	81.3%
% households connected	53.5%	51.1%	100%	100%
Gini coefficient	0.560	0.556	0.561	0.554
Gini coefficient for wealth	0.763	0.770	0.730	0.740
% households in extreme poverty	1.9%	1.6%	2.5%	2.1%
% households in poverty	12.4%	3.5%	13.4%	4.3%
Δ		-0.8%		-0.7%

Table 7: Alternative policy.

The reason why wealth inequality increases is intrinsically related to the fact that social welfare increases. This alternative policy improves social welfare because it essentially provides a better insurance arrangement for the households in the economy. Thus, precautionary motives weaken leading the poorest households to reduce savings proportionally more than wealthier households. As a consequence, wealth inequality increases.

As Figure 1 highlights, it is not clear if the improvements in welfare, income inequality and poverty rates come from the employment requirement or the different transfer schedule. Hence, we also evaluate a policy that complements total income up to $\bar{y}$ even if the household is not working.[39] In comparison with the benchmark CTP (Table 7, second column), the Gini coefficient increases by 0.007, both poverty rates increase by more than 5 percentage points, and the social welfare increases by a tiny amount ($\Delta = -0.1$ percent). We conclude that the employment requirement, rather than the transfer schedule, is the key driving force behind these improvements in social outcomes.[40]

For simplicity, this framework ignores relevant aspects of the labor market, such as search frictions.[41] Importantly, unemployment is voluntary in this model. If the government cannot

[39] Again, $\bar{y}$ is chosen such that total transfers is equal to B.

[40] Alternatively, we could simply impose labor supply requirements in the CTP such that some of the households would not be eligible for the program anymore. In order to exhaust the budget B, the government would increase the program coverage and the amount transferred. Thus, there would be multiple combinations of T and $\bar{y}$ that clear the budget. The evaluation of this set of alternative policies is left for future research.

[41] See Krusell et al. [2008] for a model with search frictions and incomplete markets.

verify whether unemployment is voluntary or involuntary, implementing this policy may hurt vulnerable families that are willing to work but unable to find a job.

Finally, consider the intensive margin of labor supply.[42] Since the marginal income tax rate is -100 percent in the alternative program, those households in the program have incentives to reduce hours worked as much as possible. Consequently, if the intensive margin importance is large, the government should also provide incentives to work along this margin, otherwise the average cash transfer per household in the program may decrease.[43]

5 Conclusion

In this paper, we evaluate the view that CCTPs' primary focus should be on improving the social safety net. In an incomplete markets model with uninsured idiosyncratic risk calibrated to Brazil, we show that the program increases welfare and decreases poverty, but it increases wealth inequality. We conclude raising some concerns regarding the extrapolation of these results.

First, we ignore a key aspect of the program – its conditions on health and schooling; thus, a more complete model – that accounts for intra-household heterogeneity, fertility decisions and human capital formation – is needed to evaluate all the relevant implications of CCTPs.

Second, the key driving force of the model is precautionary motives; however, whether these motives are empirically sizeable is still an open debate.

Third, the equilibrium concept embeds stationarity; however, the Gini coefficient has been falling over the past years in Brazil.[44]

Fourth, for simplicity, the model abstracts from some features that may be relevant in practice; namely, part of the income may not be observable, eligible households may not be

[42] Blundell et al. [2011], for instance, argue that neither the intensive nor the extensive margin dominates in explaining changes in total hours worked for France, the U.K. and the U.S.

[43] See Saez [2002] for the optimal design, that accounts for intensive and extensive labor supply responses, of income transfer programs in another context.

[44] See, for example, de Barros et al. [2007b].

able to enroll in the program if the budget is miscalculated, and the actual program has multiple combinations of thresholds and transfers.

Finally, welfare characterizations are sensitive to the degree of financial connection in the economy; however, this figure may be biased since we do not observe access to banks at the household level.

Nonetheless, our modeling strategy provides new insights that should be factored in when implementing CCTPs. More specifically, precautionary motives due to imperfect insurance may lead transfers targeting the poor to improve social welfare from an utilitarian perspective. However, similar policies that also stimulate employment may further increase social welfare.

References

S. R. Aiyagari. Uninsured idiosyncratic risk and aggregate saving. *Quarterly Journal of Economics*, 109(3):659–684, 1994. 2, 8

J. Alonso-Ortiz and R. Rogerson. Taxes, transfers and employment in an incomplete marktes model. *Journal of Monetary Economics*, forthcoming. 4, 8, 12

R. Blundell, A. Bozio, and G. Laroque. Extensive and intensive margins of labour supply: Working hours in the us, uk and france. IFS Working Paper, 2011. 28

M. Cagetti and M. D. Nardi. Estate taxation, entrepreneurship, and wealth. *American Economic Review*, 99(1):85–111, 2009. 5

C. D. Carroll and M. S. Kimball. Precautionary saving and precautionary wealth. In S. N. Durlauf and L. E. Blume, editors, *The New Palgrave Dictionary of Economics*. Palgrave Macmillan, 2008. 22

A. Castaneda, J. Díaz-Giménez, and J. V. Ríos-Rull. Accounting for the u.s. earnings and wealth inequality. *Journal of Political Economy*, 111(4):818–857, 2003. 4, 17

Y. Chang and S.-B. Kim. Heterogeneity and aggregation: Implications for labor-market fluctuations. *American Economic Review*, 97(5):1939–1956, 2007. 8

J. C. Conesa and D. Krueger. On the optimal progressivity of the income tax code. *Journal of Monetary Economics*, 53(7):1425–1450, 2006. 5

J. C. Conesa, S. Kitao, and D. Krueger. Taxing capital? not a bad idea after all. *American Economic Review*, 99(1):25–48, 2009. 5

J. B. Davies, S. Sandstrom, A. Shorrocks, and E. N. Wolff. The world distribution of household wealth. In J. B. Davies, editor, *Personal Wealth from a Global Perspective*, chapter 19, pages 395–417. Oxford University Press, 2008. 16

R. P. de Barros, M. de Carvalho, and S. Franco. O papel das transferncias públicas na queda recente da desigualdade de renda brasileira. In R. P. de Barros, M. N. Foguel, and G. Ulyssea, editors, *Desigualdade de Renda no Brasil: Uma Análise da Queda Recente, Volume 2*, chapter 16, pages 41–86. IPEA, 2007a. 21

R. P. de Barros, M. N. Foguel, and G. Ulyssea. *Desigualdade de Renda no Brasil: Uma Análise da Queda Recente, Volumes 1 and 2*. IPEA, 2007b. 21, 28

D. Domeij and J. Heathcote. On the distributional effects of reducing capital taxes. *International Economic Review*, 45(2):523–554, 2004. 5

A. Erosa and G. Ventura. On inflation as a regressive consumption tax. *Journal of Monetary Economics*, 49(4):761–795, 2002. 9

A. Fiszbein and N. Schady. *Conditional Cash Transfers: Reducing Present and Future Poverty*. The World Bank, 2009. 2, 7, 9, 22, 23

M. Flodén. The effectiveness of government debt and transfers as insurance. *Journal of Monetary Economics*, 48(1):81–108, 2001. 13

M. Flodén and J. Lindé. Idiosyncratic risk in the u.s. and sweden: Is there a role for government insurance. *Review of Economic Dynamics*, 4(2):406–437, 2001. 5, 12, 14

M. N. Foguel and R. P. de Barros. The effects of conditional cash transfer programmes on adult labour supply: An empirical analysis using a time-series-cross-section sample of brazilian municipalities. *Estudos Econômicos*, 40(2):259–263, 2010. 7, 23

E. French. The effects of health, wealth, and wages on labour supply and retirement behaviour. *Review of Economic Studies*, 72(2):395–427, 2005. 14

J. Heathcote. Fiscal policy with heterogeneous agents and incomplete markets. *Review of Economic Studies*, 72:161–188, 2005. 5, 13

J. Heathcote, K. Storesletten, and G. L. Violante. Quantitative macroeconomics with heterogeneous households. *Annual Review of Economics*, 1:319–354, 2009. 8

M. Huggett. The risk-free rate in heterogeneous-agent incomplete-insurance economies. *Journal of Economic Dynamics and Control*, 17(5-6):953–969, 1993. 2, 8

A. Imrohoroglu. The welfare cost of inflation under imperfect insurance. *Journal of Economic Dynamics and Control*, 16(1):79–91, 1989. 2, 8, 9

L. Kaplow. *The Theory of Taxation and Public Economics*. Princeton University Press, 2008. 13

S. Kitao. Entrepreneurship, taxation and capital investment. *Review of Economic Dynamics*, 11(1):44–69, 2008. 5

P. Krusell, T. Mukoyama, R. Rogerson, and A. Sahin. Aggregate implications of indivisible labor, incomplete markets, and labor market frictions. *Journal of Monetary Economics*, 55(5):961–979, 2008. 27

M. Manacorda, E. Miguel, and A. Vigorito. Government transfers and political support. *American Economic Journal: Applied Economics*, forthcoming. 7

C. A. Meh. Entrepreneurship, wealth inequality, and taxation. *Review of Economic Dynamics*, 8(3):688–719, 2005. 5

R. A. Moffitt. Welfare programs and labor supply. In A. J. Auerbach and M. Feldstein, editors, *Handbook of Public Economics, Volume 4*, chapter 34, pages 2393–2430. Elsevier B.V., 2002. 25

H. Oh and R. Reis. Targeted transfers and the fiscal response to the great recession. NBER Working Paper 16775, 2011. 4

R. A. C. Pereira and P. C. G. Ferreira. Avaliação dos impactos macro-econômicos e de bem-estar da reforma tributária no brasil. *Revista Brasileira de Economia*, forthcoming. 14

J. Pijoan-Mas. Precautionary savings or working longer hours? *Review of Economic Dynamics*, 9(2):326–352, 2006. 18

M. Ravallion. How relevant is targeting to the success of an antipoverty program? *The World Bank Research Observer*, 24(2):205–231, 2009. 22

R. P. Ribas and F. V. Soares. When conditional transfer is not a novelty: The impact of bolsa família on labor market in brazil. Working paper, 2010. 7, 23

J. V. Ríos-Rull. Computation of equilibria in heterogeneous-agents models. In R. Marimon and A. Scott, editors, *Computational Methods for the Study of Dynamic Economies*, pages 238–64. Oxford University Press, 1999. 13

E. Saez. Optimal income transfer programs: Intensive versus extensive labor supply responses. *Quarterly Journal of Economics*, 117(3):1039–1073, 2002. 28

F. V. Soares, S. Soares, M. Medeiros, and R. G. Osório. Programa de transferência de renda no brasil: Impactos sobre a desigualdade. IPEA Texto para Discussão 1228, 2006. 22

S. Soares and N. Sátyro. O programa bolsa família: Desenho institucional, impactos e possibilidades futuras. IPEA Texto para Discussão 1424, 2009. 5, 6

S. Soares, R. P. Ribas, and F. V. Soares. Focalização e cobertura do programa bolsa família: Qual o significado dos 11 milhões de famílias? IPEA Texto para Discussão 1396, 2009. 15, 21

G. Tauchen. Finite state markov chain approximations to univariate vector autoregressions. *Economic Letters*, 20(2):177–181, 1986. 14

C. Zucco. Conditional cash transfers and voting behavior: Redistribution and clientelism in developing democracies. Working paper, 2011. 7