

**Conditional Cash Transfers and Rural Development Policies in Brazil:  
Exploring Potential Synergies between Bolsa Família and PRONAF**

Felipe Garcia  
Universidade Federal de Pelotas

Steven M. Helfand  
University of California, Riverside

André Portela Souza  
Fundação Getulio Vargas, São Paulo

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## **1. Introduction**

This chapter examines possible synergies between conditional cash transfer programs (CCTs) and rural development policies in Brazil. Policy synergies could exist for a variety of reasons. In environments where there are market failures for credit and insurance, CCTs could provide liquidity and reduce vulnerability to shocks, thereby contributing to the potential success of rural development interventions. CCTs might improve the nutrition and health of families, allowing them to work more productively. CCTs could also increase the independence and bargaining power of women, permitting them to participate more fully in community based rural development projects. This too might contribute to their success. Synergies might also run in the opposite direction. Rural development policies that succeed in raising income could enhance the impacts of CCTs on the health and education of children. To the extent that synergies exist, government officials might seek to coordinate the design and delivery of these policies in order to take advantage of the complementarities and increase the program impacts. In this chapter we test for the existence of policy synergies and estimate their magnitude in rural Brazil.

Conditional cash transfer and rural development policies have grown rapidly in Brazil since the mid-1990s. The first conditional cash transfer program—Bolsa Escola—was introduced in the municipality of Campinas in 1995, and by 2002 had become a federal program operating in nearly all Brazilian municipalities. The program was modified and expanded under President Lula. In its current form, Bolsa Família reaches over 13 million families. Among the rural development policies, we focus on the National Program to Strengthen Family Farming (PRONAF). PRONAF was created in 1996 and expanded rapidly in the early 2000s. There were more than 1.8 million credit contracts with family farmers in 2012. We are not aware of any research that has sought to identify potential synergies between the two programs.

The possibility of designing and implementing policies in order to take advantage of policy synergies--and thereby leverage possible policy multipliers--is extremely important even in a country like Brazil because rural poverty remains quite high. Rural poverty declined rapidly between the early 1990s and 2005, but continues to be more than double the rate of poverty in urban areas. Helfand et al. (2009) estimate that the rural poverty rate fell from 62% to 46% between 1992 and 2005, and continued to decline at least up until the recent global recession. Rural poverty is concentrated in

the Northeast of the country, and rural poverty rates are twice as high there relative to the Center-South of the country.

In this paper we examine the evidence for three hypotheses about potential synergies between Bolsa Família (BF) and PRONAF (PR). The hypotheses are formulated as follows: Households that are beneficiaries of Bolsa família and PRONAF will have more success 1) increasing productivity in agriculture, 2) increasing agricultural income, and 3) reducing child labor in agriculture, than families that just receive one type of intervention (BF or PR) or families that do not receive any kind of intervention. We use a difference in differences methodology with municipal level fixed effects to investigate if municipalities where BF and PRONAF incidences increased more were associated with greater increases of productivity and income and a greater decrease of child labor. We limit attention to these three outcome variables because they are the ones that we can best address with the data used in this paper. The models are estimated with municipal level data on farms under 500 hectares drawn from the 1995-96 and 2006 Agricultural Censuses in Brazil. Limitations of the data and identification strategy prevent us from claiming—with a high degree of certainty—that these are causal estimates. Reverse causality, however, is ruled out in a number of cases, and the robustness and heterogeneity of the results are explored. Taken as whole, the results suggest that significant relationships exist across programs and with the outcome variables, and that these relationships warrant additional research.

The econometric analysis of Bolsa Família and PRONAF is complemented by results from approximately 30 interviews with federal and state level policy makers, government officials, and the directors of rural development projects in Brazil.<sup>1</sup> The interviews were semi-structured, with the purpose of helping us to gain a deeper understanding of how government officials and project directors think about the potential synergies between conditional cash transfers and a broad set of rural development policies in Brazil. We asked about synergies at two levels. First, we investigated their views about the importance of policy interactions for the beneficiary families. Their views could provide insight into the relevance of the hypotheses being studied, as well as the potential mechanisms that facilitate or impede policy synergies. Second, if government officials believe that synergies exist and that policies work better

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<sup>1</sup> We also draw from Burgos et al. (2014) for insight into the institutional dimensions of policy synergies. We thank them for discussions and comments that have contributed to improving this paper.

together than in isolation, we would expect them to coordinate in the design and execution of those policies. The extent of coordination at the level of policy making and implementation is also explored in this chapter.

Section 2 of this paper provides background information on cash transfer and rural development policies in Brazil, and briefly summarizes the literature on the impacts of the two policies. Section 3 describes the methodology and data, and discusses the econometric results. Potential channels through which the policies might operate are also explored. Section 4 of the paper discusses the key findings from the interviews with government officials and program directors. Conclusions are discussed in Section 5.

## **2. Description of the Policies: Bolsa Família and PRONAF**

### *a. Public Transfers and the Bolsa Família Conditional Cash Transfer Program*

Public transfers were one of the factors responsible for the significant reduction of poverty in Brazil in the last decade.<sup>2</sup> There are three main federal programs that transfer cash to the poor: (i) pensions to poor elderly or disabled people (BPC/LOAS); (ii) rural pensions (*aposentadoria rural*); and (iii) conditional cash transfer programs (Bolsa Família).

The BPC/LOAS program is targeted at poor elderly and disabled people. Its unit value is one minimum wage per month. There were 3.96 million beneficiaries in 2013, and the government spent R\$ 31.4 billion in that year (0.65% of GDP). Rural pensions transfer income to the elderly who document that they worked in agriculture or as subsistence producers. The unit value is also one minimum wage per month, and the program covered around 9 million beneficiaries in 2013. The annual expenditure was R\$ 80.4 billion in 2013 (1.66% of GDP).

The Bolsa Família (BF) program is a conditional cash transfer program officially launched by the Brazilian federal government in 2004. It consisted of a merger of several existing social programs, such as the cooking gas subsidy, the National School Allowance Program, the Food Card Program, the Food Allowance Program, and the

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<sup>2</sup> Barros et al. (2010) show that transfers *and* labor market income were both extremely important factors contributing to the decline in poverty and income inequality in the first decade of the millennium.

Child Labor Eradication Program.<sup>3</sup> Bolsa Família is a conditional cash transfer program targeted at the extreme poor and poor.<sup>4</sup> The goal of the program is to increase the income level of these families, as well as to generate direct incentives for children to improve their education and health outcomes.

The Bolsa Família program is decentralized. Its resources are centrally administered by the Ministry of Social Development, but it is locally managed by the municipal authorities. The municipalities are responsible for selecting the families and keeping track of the fulfillment of the eligibility criteria as well as the conditionalities. The municipalities inform the Ministry about the families selected and the Ministry itself directly transfers the income to the families.

Extremely poor families receive a fixed basic income transfer plus a variable income transfer depending on the number of children in the family. Poor families receive the variable income transfer only. The transfers are conditional on school attendance of the children and regular visits to health care centers. The value of the transfers is relatively low (around 1/5 to 1/7 of the minimum wage). There were 13.8 million families in the program in 2013. The annual expenditure was R\$24.5 billion in 2013 (0.5% of GDP).

The program has five kinds of benefits. Their values in 2013 were as follows: *Benefício Básico* (the transfer of R\$77 granted only to extremely poor families), *Benefício Variável* (the value of R\$32 for each person in the family, who has at most 15 years, or is pregnant and/or a nursing mother<sup>5</sup>), *Benefício Variável Vinculado ao Adolescente* (BVJ) (the transfer of R\$42 for each person in the family who has between 16-17 years<sup>6</sup>), *Benefício Variável de Caráter Extraordinário* (BVCE) (the value is calculated for each case, and is granted to the families that came from programs that preceded BF) and the *Benefício para Superação da Extrema Pobreza na Primeira Infância* (BSP) (with a value necessary for families that have children between zero and

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<sup>3</sup>The program is pursuant to law 10.836, as of January 9, 2004, and is currently managed by the Brazilian Ministry of Social Development and Hunger Eradication.

<sup>4</sup> The thresholds are currently set at family per capita income below R\$70 per month for the extreme poor, and between R\$70 and R\$140 per month for the poor. The thresholds are lower than what most researchers consider appropriate for measuring poverty and extreme poverty in Brazil. For example, a recent Ph.D. dissertation by Rodrigues (2014) estimates an extreme poverty line based on nutritional necessities alone of R\$103 in 2008-09—which is nearly 50% higher than the extreme threshold used for Bolsa Família.

<sup>5</sup>This benefit is limited to only 5 people in the family.

<sup>6</sup>Limited to only two people.

six years to surpass R\$70 a month per person). In 2011 a new benefit was created called *Retorno Garantido*, which guarantees the automatic returns of families that voluntarily exit the program and might need to return at a future date. The average benefits were around R\$120 per family.

Families failing to meet the conditionalities of the program are subject to gradual penalties, including notification, cancellation of the cash transfer, and eventually exclusion from the program. Nevertheless, no severe penalties exist for manipulating income information. Income verification for participation in the program depends on the institutional framework of each region, and this data is compromised by the fact that a large number of beneficiaries hold informal jobs.

#### *b. Rural Development Policies and the PRONAF Family Farmer Credit Program*

Agricultural policies in the 1970s and 1980s relied on massive credit subsidies intended to induce modernization, support prices and government stocks that sought to reduce price risk for both producers and consumers, and trade policies that taxed competitive exportables and protected key importables like wheat. The policy package was not inclusive of small, family farmers, and was largely dismantled in the late 1980s and early 1990s. A new set of policies began to emerge in the mid-1990s, including land reform and credit to family farmers (PRONAF). The reorientation of policy reflected broader trends of democratization, but also responded to growing pressure from rural social movements and NGOs. Policies aimed at strengthening the family farm sector continued to expand under President Lula in the 2000s.

The most important policy innovation related to rural development was the creation of the National Program to Strengthen Family Farming (PRONAF) in 1996. PRONAF is largely a credit program for family farms, but there are some complementary components as well. PRONAF has expanded to nearly all municipalities in the country. In 1999 it was present in 3403 municipalities, and by 2009 it reached over 5400 (DIEESE, 2011).

Five years after its inception, in 2000/01, the number of contracts had grown to almost 900 thousand and the value of loans was over four billion reais (in 2012 values). The number of contracts peaked in 2005 and 2006 at over two million, declining to

around 1.5 million contracts per year in subsequent years. The real value of loans, in contrast, continued to rise. In 2012, Central Bank data show around 1.8 million contracts and over 16 billion reais in loans (Silveira and Valadares, 2014). With the number of contracts falling and the average contract values rising, there has been some concern that the program has not been as inclusive as it could be of poor family farms.

PRONAF has gone through several key phases of development (Mattei, 2011). The first phase, from 1996-1999, was characterized by small changes in the rules, and a steady decline in interest rates from 12% per year to under 7%. In the second phase, producers were stratified into six groups based on income and other factors, with different terms of credit available to each one. Group A, for example, comprised land reform beneficiaries, Group C included producers with income between R\$4000 and R\$18,000, while Group E targeted producers with annual income between R\$50,000 and R\$110,000. Since 2008 the number of groups was reduced to three, but the variety of lines of credit expanded. In addition to production credit, there are credit lines for investment (with interest rates of 1% or 2% per year depending on level of income), microcredit, agroecology, women, agroindustry, youth, the semi-arid, land reform settlements, etc. The terms of each line of credit can vary across the three income groups ([www.mda.gov.br](http://www.mda.gov.br)). With production credit, for example, farmers in the first group can have income up to R\$10,000 and can borrow at an annual interest rate of 1.5%. The second group of farmers can have income between R\$10,000 and R\$30,000, and the interest rate is 3% per year. The third group of farmers can have income up to R\$100,000 per year, and the interest rate on their loans is set at 3.5% per year.<sup>7</sup>

It is important to emphasize that Brazil's strategy to strengthen family farms in the 1996-2006 period under study relied almost exclusively on subsidized credit, much in the same way that the modernization of agriculture did in the 1970s and 1980s. Guanziroli (2007), for example, estimates that the Treasury contributed around 28% of the value of loans in 2005 in order to subsidize interest rates. The difference with the earlier period is that subsidized credit was extended to a segment of family farms. Data from the 2006 Agricultural Census show that 14.3% of family farms obtained credit through PRONAF. This group is almost certainly more productive than the typical

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<sup>7</sup> Because the Agricultural Census does not distinguish between the different lines of PRONAF, the econometric analysis in this paper treats PRONAF as a single program. Future research might seek to analyze synergies between Bolsa Familia and those lines of PRONAF—such as PRONAF B—that are targeted at the poorer family farmers.

family farmer, and more integrated into markets. In fact, much of the early Brazilian literature on PRONAF was concerned with the concentration of credit in the South—where about 50% of the resources flowed—and to richer family farmers (Mattei, 2006).

Crop insurance and technical assistance can accompany PRONAF credit, although only a small share of family farmers report using technical assistance. The 2006 Agricultural Census suggests that only 19% of family farmers use technical assistance (7% with credit, and 12% without it). The government also developed a program to purchase food directly from family farmers (*Programa de Aquisição de Alimentos, PAA*). This expanded to purchases from over fifty thousand family farmers in 2005, and has continued to grow since then.

Many of the investments in rural and municipal infrastructure occur outside of the policies that specifically target family farmers, but some of them have been extremely important. The *Luz para Todos* program extended electricity to a large number of rural residents, and the Agricultural Censuses of 1995-96 and 2006 record an increase of 30 percentage points in the number of establishments with electricity. Other investments in infrastructure, water, and sewage have been important, but are not easy to measure at a local level.

Finally, both the Cardoso and Lula governments boast having settled hundreds of thousands of families through land reform, although it appears that the Agricultural Census records a much smaller number of families. The policies include state led land reform (expropriation of unproductive land with compensation), market assisted land reform (based on long term subsidized credit) through the *Crédito Fundiário* program, and investments in land reform settlements. IFAD has been active on this last front through the Dom Helder Camara program in the Northeast of Brazil (IFAD, 2008). There has been little rigorous evaluation of the impacts of land reform in Brazil, and this remains an important area for future research.

### *c. The Literature on Bolsa Família and PRONAF*

To the best of our knowledge, there are no studies that seek to analyze the joint impacts of Bolsa Família and PRONAF. For this reason, we provide only a very brief review of the separate literatures on each program.

## *Bolsa Família*

The Bolsa Família program is a conditional cash transfer program targeted at poor families aimed to curb short and long run poverty. There are many studies that seek to evaluate the impacts of Bolsa Família on different outcomes. Since there was no experimental pilot program or randomized selection into the program, all studies rely on non-experimental data to provide estimates of the program impacts on important dimensions of the well-being of the families.

Although it is a large scale program, most studies show that Bolsa Família is relatively well targeted when compared with other targeted social programs. For instance, Soares et al. (2009) estimate that 56.3% of all eligible families in 2006 were beneficiaries. Of all families not eligible, 9.8% were registered in the program. Souza et al. (2013) updated these figures using the 2010 demographic census and found almost identical results. Thus, there are not much leakages of the program for non-eligible families and there are still many eligible families that are not in the program. Several reasons are raised to explain the lack of coverage including budget restrictions, lack of information among poor families, and concerns about potential stigmas (Kerstenetzky, 2009). Nonetheless, Bolsa Família is currently the biggest social program in Brazil. It covers millions of families, particularly in the Northeast region where poverty is highest.

The first goal of the conditional cash transfer program is to mitigate income poverty in the short run. The existing studies find some success in meeting this goal. Barros et al. (2010), Soares et al. (2009), and Soares and Satyro (2009) all find that Bolsa Família has had a positive impact on the reduction of income inequality and poverty in Brazil. For instance, Barros et. al. (2010) estimate that between 2001 and 2008, BF accounted for 15% of the decrease of extreme poverty and 35% of the reduction in the poverty gap of the extreme poor.

The second goal of the program is to eliminate the vicious cycle of poverty by inducing human capital accumulation of the next generation. The program generates incentives by imposing conditionalities on the families. In the case of the Bolsa Família, it requires regular school attendance and health care center visits. There are no longitudinal data available to evaluate how well the adults that were beneficiaries when children are faring in the labor market today. In order to examine this aspect, all the

studies rely on current information about child and young adult outcomes. Ferro and Kassouf (2003), Cardoso and Souza (2009) and Glewwe and Kassouf (2012) note the positive effect that conditional cash transfer programs have on increasing the school attendance of children whose families are beneficiaries. However, the impacts are not large. For instance, Glewwe and kassouf (2012) find that Bolsa Família increased enrollment in primary education by 5.5%, lowered dropout rates by 0.5 percentage points and raised grade promotion by 0.9 percentage points.

Regarding health outcomes, the studies do not find significant impacts on the beneficiaries. For instance, Machado e Souza (2008) estimate the impact of BF on anthropometric outcomes of children in the Northeast region in 2004. They do not find significant difference between beneficiaries and similar observable non-beneficiaries. Andrade et al. (2006), using official information from the administrative data, find no impacts on nutrition and immunization. Camelo et al. (2009), using data from the Ministry of Health, do not find any significant impact on child mortality in 2006.

There may be unintentional effects of conditional cash transfer programs that mitigate its expected poverty reducing effect. One of them is the potential impact on adult labor supply. Several studies have sought to determine the effects of Bolsa Família and other conditional cash transfer programs on adult labor supply in Brazil (e.g., Soares et al. (2007); Ferro and Nicollela (2007); Tavares (2008); Teixeira (2008); Covre et al. (2008); and Foguel and Barros (2008). In general, these analyses on the adverse incentives related to conditional cash transfer programs have led to varied conclusions. The studies use different empirical strategies to compare all beneficiaries against observationally similar non-beneficiaries. The program has a set of incentives that can affect the adult labor supply in opposing directions. On one hand, the income transfer may lead to a decrease in labor supply if leisure is a normal good. On the other hand, the conditionalities related to the time allocation of children and adolescents may change adult time allocation, which may increase this group's labor supply. These empirical studies estimate the net effect of these different channels. In general, they find negligible or small adverse effects on adult labor supply. However, they find negative effects on mothers.

As in the case of Bolsa Família, there are no experimental studies that have sought to evaluate PRONAF's impact. The program has been studied with official data, secondary data, and in some cases cross-sectional surveys. But unlike with Bolsa Família, there are few if any studies that have used control groups or econometric approaches that would permit approximating the causal effect of the program on productivity, income, or other relevant outcomes. For this reason we only briefly summarize the literature on PRONAF.

An evaluation of the impact of PRONAF on productivity, income and poverty is important for several reasons. First, given that PRONAF focused excessively on production credit in the early years, it might have led to increased use of inputs without leading to a change in the level of technology. In more recent years the share of investment credit has risen. Second, given that interest rates are highly subsidized and extremely low, generally between 1% and 4% in 2013, it is quite possible that this could lead to lending for low return projects. For both of these reasons, it would be valuable to have a methodologically solid study of the impacts of the program.

The literature on PRONAF is quite large. Mattei (2006) provides an exhaustive review of the literature in a book marking the first 10 years of the program. He identifies 91 academic papers, a large share of which were conference presentations, 37 masters and Ph.D. dissertations, and 16 reports. He describes the most important themes as 1) rural credit, where topics such as the concentration of credit in the South, in certain agroindustries, and in some of the most dynamic regions were identified as problems and distortions; 2) social participation and control, where issues such as municipal rural development councils (CMDR) and social capital have been addressed; 3) municipal infrastructure and services, where a focus on territorial development was studied; and 4) general evaluations of PRONAF, where he writes that it is a "consensus in practically all of the papers" that PRONAF credit "is decisive for family farms to continue their social reproduction" (p. 52).

Guanziroli (2007) also provides a useful review of the literature on program impacts in the first decade. He summarizes the limitations of the literature as follows: "The majority of the papers have focused more on an evaluation of the process than on an analysis of the impacts. It was also not possible to find impact evaluations that included a proper control group that would permit constructing a counterfactual that is

necessary to compare effects on beneficiaries and non-beneficiaries. We did not find studies that used panel data...” In light of these limitations, he reviews 13 of the best studies that he was able to identify. These included papers that 1) surveyed 6,100 farmers of which 2/3 were PRONAF beneficiaries. OLS results indicated a positive impact of the program on value of output and output per capita, while propensity score results showed the opposite. 2) A survey of 4,500 farmers in the state of Pernambuco of which 2/3 were beneficiaries. The overall impact was negative compared to non-beneficiaries, but in certain sub-groups a positive result was found. 3) A study of municipal level productivity growth that used matching to construct a control group. The control group had faster productivity growth except in the final few years, which led the authors to suggest that the impact of PRONAF might happen with a lag. 4) A study of nearly 2000 producers in the Northeast and South, half of which were beneficiaries. The estimated effect of the program was negative. Guanzirola concludes that of the 13 papers, five showed positive results, two were ambiguous, and six were negative.

A final study worthy of mention is Helfand et al. (2013). The authors use the 2006 Agricultural Census to study productivity and poverty among family farms in the Northeast and South of Brazil. These two regions were home to nearly 70% of the family farms in Brazil. While the focus of the paper is not specifically on credit, the authors analyze differences in productivity and poverty among family farms with and without credit in each region. The results cannot be interpreted as the causal impact of credit, because no attempt was made to control for self-selection, but they do suggest an upper bound on how important credit might be for certain outcome variables. First, the authors show that the difference in poverty levels between users and non-users of credit is much smaller in the Northeast than in the South. The difference was only 6 percentage points in the Northeast, while it was 26 percentage points in the South. Thus, credit potentially had a much larger impact in the South. The authors study the channels for these effects by examining the per hectare levels of output, input expenditures, capital and family labor, and how they combine to produce differences in productivity and income. In the Northeast, users of credit generated income that was 35% higher than non-users, and this was a result of using 10% to 25% more of all inputs. In the South, credit users had income that was 100% higher than non-users, and they did this by using 40% more purchased inputs per hectare, 13% more capital and

12% less family labor. The study highlights the importance of exploring heterogeneity across the regions of Brazil, and of identifying the various channels through which PRONAF could impact productivity and income.

### **3. Empirical Analysis**

In this section we test three related hypotheses that would provide suggestive evidence for potential synergies between the two programs.

- 1) Households that are beneficiaries of Bolsa Família and PRONAF policies will have more success increasing productivity in agriculture than families that just receive one type of intervention (BF or PR) or families that do not receive any intervention.
- 2) Households that are beneficiaries of BF and PR policies will have more success increasing agricultural income per family worker—and thus reducing poverty—than families that just receive one type of intervention or families that do not receive any intervention.
- 3) Households that are beneficiaries of BF and PR policies will have more success reducing on-farm child labor than families that just receive one type of intervention or families that do not receive any intervention.

Household level impacts should be reflected in the municipal level data that are used in this paper.

#### **3.1 Methodology**

We use a difference in differences methodology with municipal level fixed effect. Thus, a causal interpretation of the results rests on the assumption that the municipal level changes over time in the incidence of both programs are exogenous. Because we are not able to demonstrate the validity of this assumption, we interpret the results as reflective of associations that are merely suggestive of possible causal impacts. Section 3.5 on channels provides additional evidence on the mechanisms through which causation might work. The models are estimated with municipal level

data for farms up to 500 hectares drawn from the 1995-96 and 2006 Agricultural Censuses in Brazil. The methodology is explained in detail below.

Our goal is to estimate the impacts of the two programs, Bolsa Família (BF) and PRONAF (PR), as well as the impact of their interaction, on a set of outcomes for agricultural producers in Brazil. The outcomes of interest are land productivity, agricultural income per family worker, and child labor. These are the outcomes available to us in the Census.

The impacts are estimated by exploring the variation of the two programs across municipalities and time in Brazil. Consider the following specification:

$$Y_{mt} = \alpha_0 + \alpha_1 BF_{mt} + \alpha_2 PR_{mt} + \alpha_3 BFPR_{mt} + \phi' X_{mt} + \theta_m + \gamma_t + \varepsilon_{mt} \quad (1)$$

where  $Y_{mt}$  is the average outcome of interest in municipality  $m$  and year  $t$ ;  $BF_{mt}$  and  $PR_{mt}$  are the proportion of units that are recipients of the Bolsa Família and PRONAF programs in municipality  $m$  and year  $t$ , respectively;  $BFPR_{mt}$  is the proportion of farms that are beneficiaries of *both* Bolsa Família and PRONAF programs;  $X$  is a set of mean municipal control variables that changes over time;  $\theta_m$  is a region fixed effect;  $\gamma_t$  is a year fixed effect; and  $\varepsilon$  is a random error. The set of parameters to be estimated are  $(\alpha_0, \alpha_1, \alpha_2, \alpha_3, \phi)$ . The coefficients of interest are  $\alpha_1$ ,  $\alpha_2$  and  $\alpha_3$ .

The identification of the impacts will be based on the differences of variations of program incidences across regions and years. Under the assumption that these variations are exogenous, the marginal impact of Bolsa Família on a particular outcome is given by  $\alpha_1 + \alpha_3 * BFPR$ . The coefficient  $\alpha_3$  on the interaction term gives the impacts of the potential synergies between both programs. If we fail to reject that  $\alpha_3$  equals zero, then there is no evidence in support of policy synergies. In this case, the marginal impact of Bolsa Família simplifies to  $\alpha_1$ . Note, analogously, that the marginal effect of PRONAF is  $\alpha_2 + \alpha_3 * BFPR$  with synergies, and simply  $\alpha_2$  if there are no synergies.

The identifying assumption is that in the absence of BF and PRONAF the evolution of the outcome variables in the municipalities with the programs would have evolved similarly to the evolution of these same variables in the untreated municipalities. This assumption may not hold in a non-experimental environment such as this one. It is possible that the municipalities where BF and PRONAF grew more are those where productivity and income grew less (or even child labor grew more) because of reasons beyond the direct impacts of the programs. While unlikely, selection criteria for participation in the programs may depend on factors related to these trends and may explain the findings. Although we do some robustness checks, we cannot rule out the potential presence of selection bias. Still, given the importance of the issue and the scarcity of evidence for Brazil, we believe that it is an important contribution to provide evidence of correlations that are suggestive of causal impacts.

### **3.2 The Data and Descriptive Statistics**

The data used in this study were drawn from the 1995-96 and 2006 Agricultural Censuses in Brazil (IBGE).<sup>8</sup> The censuses contain data on inputs, outputs and agricultural practices for the roughly five million farms in Brazil. Due to issues of confidentiality, the microdata can only be processed in a secure site on the premises of the Brazilian Institute of Geography and Statistics (IBGE) in Rio de Janeiro. For this reason, the current paper is based on data that have been aggregated up to the municipal level and can therefore be processed outside of IBGE. Thus, the analysis focuses on variation between municipalities not variation within them. We use the sum of each variable in each location (total value of output, total expenditures, total number of farms that access credit, etc.), transformed into average values per establishment, per hectare, or—as in the case of credit—the share of establishments in the municipality with a

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<sup>8</sup> There are some differences between the two Censuses. Most importantly, the 1995-96 Census is based on the agricultural year while the reference period for the 2006 Census is the calendar year. A number of papers have demonstrated how the 1995-96 Census led to an undercounting of some farms, especially in certain sub-groups such as renters and sharecroppers (Helfand and Brunstein, 2001). Because the analysis here is based on the growth rates of municipal averages, these differences are unlikely to affect the results of this paper.

particular attribute. In each municipality, the sample is restricted to farms up to 500 hectares. These are the potential beneficiaries of PRONAF.<sup>9</sup>

It is important to clarify what we consider to be a “location” in this study. The number of municipalities in Brazil grew significantly in the past two decades. In 1996 there were 4956 municipalities, and in 2006 this number increased to 5548. The growth of municipalities creates a challenge for constructing a panel of municipalities over time. The solution that has become common among Brazilian researchers is to construct “Minimum Comparable Areas” (AMCs), which are geographical units that have not changed over time (Reis et al., 2011). If municipalities simply divided over time, then new municipalities could be aggregated to reconstruct the municipal map of the base year. However, the process of municipal creation is more complex, and sometimes new municipalities are constructed by taking pieces of several others. Thus, the number of AMCs is normally smaller than the number of municipalities in the base year. We constructed a panel of 4270 AMCs. 4251 of these had sufficient data to be included in the econometric analysis.

All monetary variables—such as value of output and value of expenditures—were deflated by IBGE’s GDP deflator for agriculture, taken from ([www.ipea.gov.br](http://www.ipea.gov.br)). All regressions are weighted by the average numbers of establishments in each AMC between 1996 and 2006, and the standard errors are clustered at the AMC level. The weighting has implications for the interpretation of the results. The estimates are representative of family farms, not necessarily of their output. These differences are diminished when the models are estimated by region.

Three features of the data merit special attention. First, the 2006 Agricultural Census does not specifically identify transfers from Bolsa Família. It asks informants if they received income from “social programs,” and it distinguishes these from social security and pension income. Because Bolsa Família is the largest social program in Brazil, it is reasonable to assume that most informants are referring to this program. However, there are many smaller state and municipal programs. For this reason, in the econometric section below, we talk about “social programs” rather than Bolsa Família.

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<sup>9</sup> PRONAF is limited to “family farms” as defined by law. One of the criteria to be a family farmer is to have no more than four “fiscal modules” of land. These modules vary by municipality. 500 hectares is approximately the upper limit of four fiscal modules in the country. The results are largely identical when the sample is restricted to farms up to 100 hectares.

Second, because of the nature of the census data, we study “agricultural” income rather than total income. For land productivity and child labor this is not a limitation. When we construct a measure of income per family worker, however, this implies that we must necessarily restrict attention to *agricultural* income per family worker. This leads to a reframing of questions about poverty. Rather than study “rural poverty,” we study poverty among agricultural producers based solely on agricultural income. Given that rural development policies, like PRONAF, seek to increase agricultural income, this seems appropriate. We also do not believe that this is a serious limitation of the data. Helfand et al. (2011) used the 1995-96 Agricultural Census to study poverty among agricultural producers. They found a correlation of 0.80 between municipal poverty among agricultural producers based solely on agricultural income from the Agricultural Census and municipal poverty among rural residents based on total income from the 2000 Demographic Census. The two approaches clearly contain a lot of the same information.

Finally, child labor refers to *on-farm* work by children under 14 years of age. There is no information in the Census about off-farm child labor. This is likely to be of much smaller magnitude than their work on-farm.

Box 1 below presents a description of the main variables used in this chapter.

### Box 1: Description of Variables

Variable	Definition
Value of output per estab. (R\$1000)	Real value of agricultural output per establishment in 2006 prices.
Expenditures per estab. (R\$1000)	Real value of expenditures per establishment in 2006 prices.
Income per estab. (R\$1000)	Real value of agricultural output minus real value of expenditures per establishment in 2006 prices.
Income per family worker (R\$1000)	Income per family worker in 2006 prices.
Land productivity (value of output/ha, R\$1000)	Real value of agricultural output per ha in 2006 prices
Family labor per estab. (equivalent male adults)	Family workers (measured in adult male equivalent units) per establishment.
Child labor per estab.	Number of children under 14 years old that work per establishment.
Incidence of PRONAF	Percent of establishments that access PRONAF.
Incidence of Social Programs	Percent of establishments that access Social Programs.

<b>Variable</b>	<b>Definition</b>
Incidence of PRONAF and Social Programs	Percent of establishments that access PRONAF and Social Programs.
% of estab. 0-5ha	Percent of establishments 0-5ha.
% of estab. 5-20ha	Percent of establishments 5-20ha.
% of estab. 20-100ha	Percent of establishments 20-100ha.
% of estab. 100-500ha	Percent of establishments 100-500ha.
% of estab. 500- ha	Percent of establishments 500- há.
% of estab. with tech. assistance	Percent of establishments that use technical assistance.
% of estab. in assoc. or coop.	Percent of establishments in assoc. or coop.
% of estab. with electricity	Percent of establishments with electricity.
% of estab. that use animals and/or machines	Percent of establishments that use animals and/or machines.
% of estab. with irrigation	Percent of establishments with irrigation.
% of estab. that use fertilizer	Percent of establishments that use fertilizer.
% of estab. that control pest and disease	Percent of establishments that use pest and disease control.
Number of tractors per estab. (100cv equivalent)	Number of tractors (100cv equivalent) per establishment.

Table 1 shows that there were nearly 4.73 million agricultural establishments in Brazil in 1996 with 500 hectares of land or less. In 2006 this number had risen slightly to 4.82 million.<sup>10</sup> Growth in the number of establishments occurred in all regions, although it happened most rapidly (36%) in the Center-West which is the region with the fewest establishments.

The real value of agricultural output per establishment rose by 47% from R\$13,995 to R\$20,523, in reais of 2006. Total expenditures on inputs rose even faster—by 60%—from R\$6,704 to R\$10,769. Input and output growth was slower than the national average in the South and Southeast, and faster in the other three regions.

We have defined real “income per establishment” as the value of output minus the value of monetary expenditures divided by the number of establishments. This is similar to short run profits. It represents the amount of monetary (and non-monetary) income left over per establishment to compensate family members and depreciation of capital. Real income rose by 34% over the decade, from R\$7,291 to R\$9,754. The variation across regions was considerable. In the North, Northeast and South, average income rose by between 59%, 94% and 25% respectively, while it grew just 8,5% in the

<sup>10</sup> We exclude “producers without area” which is a category of establishments that did not exist prior to the 2006 Agricultural Census.

Southeast and fell by 7,5% in the Center-West. As will be seen below, there was a significant increase in the standard deviation of income per establishment. We suspect that the data for the Center-West reflect both the intensive use of inputs in the region, with input expenditures nearly double the next most intensive region, and the rising heterogeneity of producers that is taking place due to rapid technological change for some.

As a reflection of the rapid rise in expenditures on inputs, and technological progress, land productivity rose by 61% in this period to a national average of R\$712 per hectare. Land productivity rose the fastest in the Northeast (100%), the poorest region of the country. When land productivity is calculated with value added rather than with value of output (“Land productivity 1”), the results are quite different. Because of the intensive use of inputs, value added per hectare only rose by 23% in the Center-West, with growth in all other regions broadly comparable to the national average increase of 52%.

**Table 1**  
**Descriptive Statistics –Brazil and Macro-regions (Establishments with 0 to 500 ha)**

Variables	Brazil		North		Northeast		Southeast		South		Center-West	
	1996	2006	1996	2006	1996	2006	1996	2006	1996	2006	1996	2006
Establishments	4,730,352	4,816,999	427,438	428,001	2,286,363	2,250,336	821,346	886,963	989,090	973,664	206,115	278,053
Value of output per estab. (R\$1000)	13.995	20.523	7.785	13.913	4.747	8.709	29.410	37.866	23.787	34.947	21.041	26.596
Expenditures per estab. (R\$1000)	6.704	10.769	1.520	3.952	1.732	2.872	15.764	23.059	11.973	20.123	11.208	17.510
Expenditures on fertilizer per estab. (R\$1000)	0.692	1.793	0.048	0.148	0.121	0.219	1.690	3.373	1.351	4.734	1.224	2.607
Income per estab. (R\$1000)	7.291	9.754	6.265	9.961	3.015	5.838	13.646	14.806	11.814	14.823	9.833	9.087
Income per family worker (R\$1000)	3.138	4.499	2.575	3.783	1.257	2.623	6.623	7.733	5.007	7.009	4.592	4.734
Land productivity (Value of output/ha, R\$1000)	0.442	0.712	0.181	0.279	0.239	0.479	0.633	1.076	0.825	1.298	0.227	0.368
Family labor per estab. (equivalent male adults)	2.323	2.168	2.433	2.633	2.398	2.225	2.061	1.915	2.360	2.115	2.141	1.919
Child labor per estab.	0.432	0.191	0.760	0.435	0.479	0.189	0.246	0.099	0.349	0.168	0.366	0.197
Incidence of Pronaf	0.000	0.123	0.000	0.051	0.000	0.087	0.000	0.092	0.000	0.285	0.000	0.073
Incidence of Credit	0.052	0.178	0.020	0.089	0.013	0.133	0.044	0.151	0.155	0.365	0.075	0.132
Incidence of Social Programs	0.000	0.140	0.000	0.102	0.000	0.219	0.000	0.059	0.000	0.068	0.000	0.040
Incidence of Pronaf and Social Programs	0.000	0.024	0.000	0.007	0.000	0.032	0.000	0.011	0.000	0.030	0.000	0.005
Percent of estab. 0-5ha	0.376	0.374	0.220	0.215	0.570	0.540	0.211	0.287	0.192	0.232	0.090	0.096
Percent of estab. 5-20ha	0.280	0.279	0.206	0.171	0.214	0.228	0.313	0.321	0.457	0.435	0.177	0.193
Percent of estab. 20-100ha	0.257	0.251	0.397	0.414	0.167	0.178	0.347	0.284	0.294	0.268	0.429	0.402
Percent of estab. 100-500ha	0.087	0.075	0.177	0.163	0.049	0.045	0.129	0.091	0.057	0.053	0.304	0.194
Percent of estab. 500- ha	0.023	0.020	0.038	0.037	0.010	0.009	0.024	0.017	0.013	0.012	0.175	0.115
Percent of estab. that use technical assistance	0.189	0.215	0.059	0.147	0.039	0.082	0.298	0.301	0.483	0.481	0.288	0.262
Percent of estab. in assoc. orcoop	0.140	0.104	0.032	0.029	0.028	0.018	0.231	0.155	0.370	0.306	0.147	0.101
Percent of estab. with electricity	0.386	0.693	0.097	0.433	0.197	0.627	0.614	0.826	0.735	0.840	0.485	0.738
Percent of estab. that use animals and/or machines	0.509	0.544	0.129	0.294	0.388	0.483	0.621	0.569	0.851	0.774	0.548	0.581
Percent of estab. with irrigation	0.058	0.064	0.006	0.025	0.048	0.057	0.124	0.123	0.052	0.049	0.047	0.048
Percent of estab. that use fertilizer	0.383	0.355	0.092	0.105	0.181	0.197	0.643	0.524	0.765	0.725	0.362	0.272
Percent of estab. control pests and disease	0.656	0.396	0.425	0.193	0.501	0.270	0.828	0.443	0.921	0.780	0.903	0.309
Number of tractors per estab. (100cv equivalent)	0.065	0.073	0.004	0.017	0.005	0.008	0.136	0.136	0.156	0.185	0.124	0.118

Note: All monetary values in 2006 prices.

Family labor per establishment—measured in adult male equivalent units—declined slightly between 1996 and 2006, from 2.32 to 2.17. The decline was observed in all macro regions except the North. The decline in child labor, however, was much sharper. Child labor—defined as those under 14 years of age—fell from 0.42 per establishment to 0.19, which can be interpreted as a decline from roughly one child working on every two establishments to one child working on every five. The percentage decline in child labor was broadly similar in all regions (42% to 60%), but the amount of child labor in the North was roughly twice the national average in both years.

With regard to PRONAF, the share of farms with access to the program rose from zero in 1995-96 to 12.3% in 2006, or more than 600,000 farms.<sup>11</sup> This figure only represents around one third of the number of contracts in that year, suggesting that many farms have multiple contracts.<sup>12</sup> Consistent with the discussion in Section 3, the South was the region with the highest share of farms accessing PRONAF—28.5%. The other regions only had between 5% and 9% each. The incidence of social programs was slightly higher at 14% in 2006. As the poorest region, 22% of farms in the Northeast reported receiving transfers from social programs. In all other regions the share did not surpass 11%. In terms of possible synergies, 2.4% of establishments reported having access to both PRONAF and social programs. In the Northeast and South the share was around 3%. While apparently small, these 2.4% of establishments represent 17.1% of the farms with BF and 19.5% of the farms with PRONAF. Thus, nearly one fifth of all establishments with access to one program also had access to the other.

Table 1 showed the means of the variables at the level of Brazil and macro-regions. The AMC level data is broadly consistent with the means presented in Table 1, and thus we only comment on it briefly here. The number of establishments in the median AMC rose from 646 in 1996 to 706 in 2006. The median values of output and expenditures per establishment rose by 29% and 43%. Median land productivity rose by 56% and median family labor productivity rose by 43%. Worthy of note is that child labor was one of the few variables to see a decline in its standard deviation in 2006, suggesting that as the level fell Brazilian municipalities became more homogeneous.

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<sup>11</sup> In addition to the number of contracts in the Census year 2006, we also attempted (unsuccessfully) to obtain data on the cumulative number of contracts by municipality between 1996 and 2006. This would have provided a more accurate measure of the intensity of treatment throughout the decade.

<sup>12</sup> This observation was confirmed by government officials who work with PRONAF.

The median incidence of PRONAF was only around 7%, indicating that there were some AMCs with much higher values. 24% of AMCs had between 10% and 20% of establishments accessing PRONAF, 8% of AMCs had between 20% and 35%, and 5% of AMCs had more than 35% of the establishments with PRONAF. A similar picture emerges for social programs. The median AMC had only 3% of farms reporting income from social programs in 2006, yet 15% of the AMCs had 10%-20% with social program income, 11% of AMCs had 20%-35%, and 5% of the AMCs had more than 35% of establishments accessing social programs.

In terms of potential synergies, a significant share of AMCs (40%) had zero farms with access to both programs in 2006. In 50% of the AMCs, the incidence of joint participation was between zero and 5%, which is consistent with the national mean of 2.4%.

### **3.3 Econometric Results**

In this section we present the impact of the Bolsa Família and PRONAF programs, and of their interaction on three outcome variables: land productivity, agricultural income per family worker and child labor. The results are presented for each outcome separately in Tables 2 through 4 below.<sup>13</sup> The first column (1) shows the results of a pooling OLS regression with a 2006 year dummy variable. Column (2) adds dummy variables for the five macro-regions of Brazil. Column (3) presents the results with minimum comparable area (AMC) fixed effects and a 2006 year fixed effect. Column (4) shows the results with AMC and year fixed effects and a set of controls—labeled “Controls 1”—that captures changes in the agrarian structure over time. These variables are AMC level proportions of farms by size: up to 5 hectares (omitted), 5 to 20ha, 20 to 100ha, and 100 to 500ha. Finally, column (5) adds a set of variables at the AMC level that vary over time. These include the percentage of farms that: use technical assistance, are in an association or cooperative, have electricity, use animals and/or machines in production, use irrigation; use fertilizers, and control pests and diseases. They are labeled “Controls 2”.

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<sup>13</sup> The Tables in this section show the estimates of the coefficients of interest. The full set of results is available from the authors.

Our main results are in column (4). These represent a difference in differences specification with AMC level fixed effects and controls for the change in agrarian structure over time. The results can be interpreted as causal effects under the assumptions that (i) the AMC level changes over time in the incidence of both programs are exogenous, and (ii) the AMC level changes over time in farm size structures are exogenous. One should be cautious about these two assumptions since the program incidences could be driven by the changes in poverty at the AMC level. The results in the other columns are presented for comparison purposes. They help to shed light on how to interpret the main results, and contribute to understanding the relationship between PRONAF, social programs and poverty in rural Brazil. The specification in column (5) includes controls that are potentially endogenous. We decided to present these results so that we could verify how the coefficients of interest change as these controls were added.

Table 2 below presents the results for land productivity. The pooling OLS results in column (1) show that the greater is the incidence of PRONAF in an AMC, the greater the average land productivity. Also, the greater is the incidence of social program in an AMC, the lower the average land productivity. Finally, the greater the proportion of farms with access to both programs, the lower the average land productivity. The same results hold when macro region dummies are added in column (2) although the interaction term is no longer statistically significantly different from zero.

In the preferred specifications with AMC fixed effects (columns (3) and (4)), the PRONAF coefficient is not statistically significantly different from zero but the interaction effect is statistically significantly different from zero at the 10% level. Moreover, the cash transfer program incidence is negative and significant at the 1% level. Considering the results in column (4), we estimate that a ten percentage point increase in the incidence of social programs is associated with a decrease in land productivity of R\$134 per year in places where there are no interactions between the two programs. Taking the mean value of land productivity in 1996 (R\$442), this effect corresponds to a decrease in land productivity of roughly 30%. However, in places where there are interactions we need to incorporate the offsetting effect of the synergy. We do this in two ways. First, if the ten percentage point increase in the incidence of social programs were fully matched by a 10 percentage point increase in PRONAF—for the same families—the two effects would cancel out and the net results would be a

reduction of only R\$5 in land productivity ( $-0.0134*10 + 0.0129*10 = -0.005$ ). Alternatively, we could assume that only 17% of the additional beneficiaries of social programs are also beneficiaries of PRONAF. This is consistent with the means in Table 1, where 14% of farms received social programs in 2006, but only 2.4% accessed both social programs and PRONAF. In this scenario, we estimate that an increase of ten percentage points in the incidence of social programs—accompanied by an increase of 1.7 percentage points in the incidence of families with both programs—is associated with a decrease of R\$112 per year in land productivity ( $-0.0134*10+0.0129*1.7 = -0.112$ ). This corresponds to a 25% decrease of the 1996 mean value of land productivity. These results suggest that there may be positive synergies between the two programs that are large enough to offset the negative effects of the growth of social programs on land productivity. The aggregate impact of the policy interaction, however, is muted by the fact that most families did not received both programs simultaneously.

Interestingly, the PRONAF coefficient under the specification in column (5) is statistically significant at the 10% level. This implies that the additional controls for technology and agricultural practices are collinear with the incidence of PRONAF, suggesting that any effect of PRONAF is likely to come through these channels. Unlike many of the other results, the PRONAF coefficients exhibit differences across regions. These issues are discussed in more detail in sections 3.4 and 3.5 below.

**Table 2**  
**Synergistic Effects on Land Productivity of the Interaction Between PRONAF**  
**and Social Programs: Brazil (Establishments with 0 to 500 ha)**

	(1)	(2)	(3)	(4)	(5)
	Brazil				
Pronaf and Social Programs Incidence	-0.0240** (0.0112)	-0.0107 (0.0105)	0.0121* (0.0072)	0.0129* (0.0073)	0.0207*** (0.0075)
Pronaf Incidence	0.0191*** (0.0027)	0.0047** (0.0024)	0.0019 (0.0018)	0.0014 (0.0018)	-0.0041* (0.0023)
Social Programs Incidence	-0.0232*** (0.0025)	-0.0203*** (0.0027)	-0.0136*** (0.0019)	-0.0134*** (0.0019)	-0.0130*** (0.0026)
Constant	0.5641*** (0.0149)	0.0306 (0.0347)	0.5578*** (0.0099)	1.6486*** (0.5327)	1.3889** (0.5463)
R-squared	0.06	0.09	0.08	0.09	0.09
# of Obs.	8495	8495	8495	8495	8495
Macro Region Fixed Effects	No	Yes	No	No	No
AMC Fixed Effects	No	No	Yes	Yes	Yes
Year Fixed Effect (2006)	Yes	Yes	Yes	Yes	Yes
Controls1	No	No	No	Yes	Yes
Controls2	No	No	No	No	Yes

Notes: Standard errors in parentheses. All regressions are estimated with AMC clusters and weighted by the mean of the number of establishments from 1996-2006. The set Controls 1 includes controls for the farm size distribution. The set Controls 2 includes controls for the use of technology and agricultural practices.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

Table 3 presents the results for agricultural income per family worker, where family workers are defined in adult equivalent male units. Income is defined as the value of output minus total monetary expenditures. Columns (1) through (4) show that there is a negative correlation between social programs and income per family worker. Column (1) shows that those AMC with a higher incidence of social program are associated with lower income per family worker. Column (4) shows that those AMC that increased the incidence of social programs more between 1996 and 2006 are associated with a lower increase of income per family worker. Interestingly, there is no correlation between the incidence of PRONAF and income per family worker. Columns (3) and (4), however, suggest that there is a positive synergy: where the two programs increase together, their combined growth has a positive effect on the growth of income per worker. Considering the point estimates of column (4), and the case where there growth in social programs is fully matched by growth in PRONAF for the same families, a ten percentage point increase in the incidence of both programs is associated with a R\$1,432 increase of annual income per family worker ( $-.1071*10 + .2503*10 = 1.432$ ). At the mean value of 1996 income per family worker, this represents a 45% increase. Under the alternative

scenario that reflects the means in Table 1, however, where the simultaneous growth of both programs is only 17% of the growth in social programs, the net impact is a 20% decline in income per family worker. Again, we conclude that there appear to be some fairly strong evidence of synergies where families receive both programs simultaneously, but the fact that most families do not participate in both programs has limited the aggregate (local) effect of the policy interactions.

**Table 3**  
**Synergistic Effects on Income Per Family Worker of the Interaction Between PRONAF and Social Programs: Brazil (Establishments with 0 to 500 ha)**

	(1)	(2)	(3)	(4)	(5)
	Brazil				
Pronaf and Social Programs Incidence	0.1744* (0.1002)	0.1425 (0.0986)	0.2226** (0.1016)	0.2503** (0.1038)	0.2857*** (0.1039)
Pronaf Incidence	0.0085 (0.0272)	-0.0336 (0.0293)	-0.0319 (0.0281)	-0.0407 (0.0289)	-0.0560* (0.0323)
Social Programs Incidence	-0.2306*** (0.0324)	-0.1453*** (0.0284)	-0.0978*** (0.0331)	-0.1071*** (0.0316)	-0.1123*** (0.0335)
Constant	3.4553*** (0.0911)	3.5723*** (0.5219)	3.4344*** (0.1509)	3.1789 (12.1222)	3.7137 (12.4092)
R-squared	0.01	0.02	0.00	0.00	0.00
# of obs.	8495	8495	8495	8495	8495
Macro Region Fixed Effects	No	Yes	No	No	No
AMC Fixed Effects	No	No	Yes	Yes	Yes
Year Fixed Effect (2006)	Yes	Yes	Yes	Yes	Yes
Controls1	No	No	No	Yes	Yes
Controls2	No	No	No	No	Yes

Notes: Standard errors in parentheses. All regressions are estimated with AMC clusters and weighted by the mean of the number of establishments from 1996-2006. The set Controls 1 includes controls for the farm size distribution. The set Controls 2 includes controls for the use of technology and agricultural practices.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

Table 4 presents the results for child labor in agriculture. The pooling OLS results in column 1 show that the greater is the incidence of PRONAF in an AMC, the greater the average child labor. Also, the greater is the incidence of social program in an AMC, the greater the average child labor. Finally, the greater is the proportion of farms with both programs, the lower the average child labor. The same results hold when macro region dummies are added (column 2).

**Table 4**  
**Synergistic Effects on Child Labor of the Interaction Between Pronaf and Social Programs:**  
**Brazil (Establishments with 0 to 500 ha)**

	(1)	(2)	(3)	(4)	(5)
Brazil					
Pronaf and Social Programs Incidence	-0.0066*** (0.0021)	-0.0042** (0.0019)	0.0017 (0.0031)	0.0017 (0.0031)	0.0015 (0.0031)
Pronaf Incidence	0.0009*** (0.0003)	0.0037*** (0.0004)	0.0014*** (0.0005)	0.0015*** (0.0005)	0.0006 (0.0006)
Social Programs Incidence	0.0042*** (0.0005)	0.0023*** (0.0005)	-0.0033*** (0.0007)	-0.0032*** (0.0007)	-0.0024*** (0.0008)
Constant	0.4401*** (0.0080)	0.4242*** (0.0143)	0.4416*** (0.0032)	-1.1356*** (0.4297)	-0.8467** (0.3758)
R-squared	0.21	0.38	0.47	0.48	0.50
# of obs	8495	8495	8495	8495	8495
R-squared	0.32	0.32	0.56	0.56	0.58
# of obs	2922	2922	2922	2922	2922
Macro Region Fixed Effects	No	Yes	No	No	No
AMC Fixed Effects	No	No	Yes	Yes	Yes
Year Fixed Effect (2006)	Yes	Yes	Yes	Yes	Yes
Controls1	No	No	No	Yes	Yes
Controls2	No	No	No	No	Yes

Notes: Standard errors in parentheses. All regressions are estimated with AMC clusters and weighted by the mean of the number of establishments from 1996-2006. The set Controls 1 includes controls for the farm size distribution. The set Controls 2 includes controls for the use of technology and agricultural practices.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

The social program incidence becomes negative and the interaction effect is no longer statistically different from zero in the preferred specifications when AMC fixed effects are added (columns 3 and 4). Considering the results of column (4), we estimate that a ten percentage point increase in the incidence of PRONAF is associated with an increase in child labor of 15 children per thousand farms. Taking the mean value of child labor per farm in 1996 (432 children per thousand farms), this effect corresponds to a 3.4% increase in child labor. Moreover, we also estimate that an increase of ten percentage points in social program incidence is associated with a decrease of 32 children per thousand farms, which corresponds to a 7.4% decrease in child labor. There is no statistically significant interaction on child labor.

Interestingly, there is no effect of PRONAF under the specification in column (5). This implies that the additional controls of technology and agricultural practices are

collinear with PRONAF incidence, suggesting that these are channels through which the effect of PRONAF operates.

Taken together, the results suggest that: (i) higher incidence of PRONAF is associated with increases in child labor, perhaps by allowing the use of inputs and technology that increase labor productivity; (ii) higher incidence of social programs is associated with decreases in child labor, probably through an income effect that induces lower child labor supply as well as a conditionality effect from Bolsa Família requiring school attendance; and (iii) there is no evidence of synergy between PRONAF and social programs.

### **3.4 Potential Heterogeneity Across Regions and Farm Size**

It is beyond the scope of this chapter to explore in detail the heterogeneity of the results across the macro-regions or farm sizes. We briefly comment on some of the most important findings for the Northeast and South regions relative to Brazil. These are the two regions with the largest number of family farms in Brazil, containing 50% and 19% of the national total. We also briefly comment on the results for the sample of farms under 100ha rather than under 500ha. This sample excludes the larger of the medium sized farms, which might respond differently to PRONAF, and focuses on a somewhat poorer group of farms, which is the target population of Bolsa Família.<sup>14</sup>

With regard to the principal coefficient of interest—the effect of the policy interaction variable—the results are robust across regions and sizes for all three outcome variables. In Brazil, the Northeast and the South, and for farms only under 100ha, the synergy coefficient is positive (but not always significant) for land productivity, positive and always significant for income, and positive but never significant for child labor. Thus, none of the principal conclusions change in any of these cases.

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<sup>14</sup> One reviewer suggested that we limit the sample even further in order to more closely approximate the poorest family farmers who access PRONAF B. We did estimate the models with farms under 20ha, rather than under 100ha, and the results were qualitatively similar. The signs of eight out of the nine coefficients were the same, with the ninth one statistically insignificant in both models. Of the seven statistically significant coefficients with the under 100ha sample, six were also significant with the under 20ha sample.

The results for social programs are also quite consistent across locations, and sizes. Where social programs have grown more quickly, land productivity and income have grown more slowly. These results are statistically significant at least at the 5% level in all cases. Child labor, in contrast, has fallen more quickly where social programs have expanded. This result is significant at the 1% level in Brazil for either size group, but not significant in either region separately.

PRONAF is the one case in which the results do sometimes differ across regions and sizes. In no case does the growth of PRONAF have a statistically significant impact on the growth of income. This is likely the result of offsetting effects on intermediate variables, a topic explored in the next Section. With regards to land productivity, however, the insignificant positive relationship at the level of Brazil appears to reflect a positive relationship in the South and a negative one in the Northeast and for smaller farms. Similarly, with regard to child labor, there are some differences across regions, but not across sizes. The channels through which these impacts might operate are explored in more detail below. The regional differences, especially for PRONAF, warrant additional research.

### **3.5 Possible Channels**

In order to shed more light on the results above, we estimate a series of AMC level difference in differences models on a set of intermediate outcome variables related to the outcomes studied in the previous sections. These variables include: value of production, total expenditures, family labor, percentage of establishments with electricity, percentage of establishments that use technical assistance, percentage of establishments that use machines, percentage of establishments that use fertilizers, number of tractors per establishments, and expenditures on fertilizers. The first three—value of production, expenditures, and family labor—are the variables used to construct family income per capita. We look at each one individually in order to further understand the results for family income. The remaining variables are related to the use of inputs and technology in production. Because their inclusion in model 5 of the tables above sometimes changed the coefficient on PRONAF, we examine them here in order to explore how PRONAF might be influencing their use. The estimations are conducted with the same sample as above: establishments up to 500 hectares. The regressions

controls for AMC fixed effects, a year fixed effect, and a set of time-varying AMC level proportions of farms by size: up to 5 hectares (omitted), 5 to 20ha, 20 to 100ha, and 100 to 500ha.

**Table 5**  
**Synergistic Effects of PRONAF and Social Programs on Possible**  
**Channels**  
**(Establishments with 0 to 500 ha)**

Channels	Interaction	Pronaf	Social Programs	N
Value of production	0.3537**	0.0233	-0.3820***	8495
Total expenditures	-0.1151	0.1015***	-0.1995***	8495
Family labor	0.0094**	-0.0034***	-0.0020**	8495
% of estab. with electricity	0.5910**	-0.4837***	0.7746***	8495
% of estab. that use tech. assistance	0.4115***	-0.0075	0.0434*	8495
% of estab. that use machines	-0.5346***	0.3553***	0.2494***	8495
% of estab. that use fertilizers	-0.1049	0.1076***	0.2822***	8495
Tractors per estab.	-0.0023***	0.0011***	-0.0001*	8495
Expenditures on fertilizers	-0.0926**	0.0443***	-0.0469***	8495

Notes: All regressions are estimated with AMC clusters and weighted by the mean of the number of establishments from 1996-2006. \* p< 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

It was reported in Table 2 that there is no correlation between the growth of PRONAF and of land productivity. This finding may be explained by the fact that access to PRONAF is not associated with an increase in the total value of agricultural production. It was also found in Table 3 that growth of PRONAF is not associated with increases in income per family worker. This finding can also be explained by the results in Table 5: PRONAF is associated with more total expenditures but less family labor. It is likely that these effects cancel out in the calculation of family income per worker. As suspected, the growth of PRONAF is positively associated with the growth of machines and fertilizers, both on extensive (the share of establishments that use them) and intensive margins.

In contrast to PRONAF, the results from Tables 2 and 3 showed that the growth of social programs is negatively associated with increases in land productivity and in income per family worker. Table 5 suggests that this can be explained by the fact that the growth of social programs is negatively associated with increases in both the value of production and total expenditures, with a stronger association with the value of production. It is possible that the decline in the value of production results from the negative relationship between social programs and adult and child family labor. Interestingly, the growth of social programs is positively associated with increased use of electricity and some of the production inputs. Perhaps the access to social programs permits accesses to other types of public sector services, or perhaps this is not a causal relationship. In the case of electricity, this is likely to reflect a correlation between the growth of Bolsa Família and the targeting rules used for the allocation of the rural electrification program (*Luz para Todos*).

Finally, with regard to the interaction term, Tables 2 and 3 showed a positive relationship with the growth of land productivity and income. For land productivity, this appears to work through increasing the value of output. For income, the effect is associated with a stronger impact on production than on family labor, without increasing expenditures.

### **3.6 Summary of Econometric Results**

The results presented above suggest that there are no synergies in the case of child labor, probably because the direct effect of Bolsa Família is quite strong. Positive synergies are likely to exist, however, for the outcome variables land productivity and income. In both cases, the positive synergies seem to be quite large, with the potential to have a significant impact on income growth and poverty reduction. The results were qualitatively similar when the sample was restricted to farms under 100 hectares, or to farms only in the Northeast or South. The aggregate municipal impact of the policy interactions, however, appears to be muted by the fact that only a small share of families received both programs simultaneously. In order to gain further insight into why this might be the case, we now turn to the interviews with policy makers and program directors.

#### **4. The Perspective of Policy Makers**

This section summarizes the results from approximately 30 interviews with federal and state level policy makers and government officials in Brazil. We sought to understand how government officials think about the potential synergies between conditional cash transfers and rural development policies in Brazil. Their views could provide insight into the validity of the hypotheses being studied in our project. Their views could also provide a deeper understanding of how these policies and programs actually work in Brazil. This information complements the quantitative analysis that we presented above, and can assist us to interpret those results. The interviews focused on a broader set of rural development policies, although PRONAF was one of the most important. The time frame of the interviews was not restricted to the present day. In most cases they began with the historical evolution of the policies under consideration. In practice, this coincides closely with the emergence and growth of PRONAF.

It is important to stress that we did not conduct a random sample of policy makers and government officials. We attempted to interview as many relevant government officials as possible in four states of the Northeast. We also interviewed several key people in the federal government from the Ministries of Social Development and Agrarian Development, the two ministries in charge of the Bolsa Família and PRONAF programs, respectively. In the four Northeastern states, we sought to interview the directors of both IFAD and World Bank supported programs in order to gather opinions from officials in charge of distinct types of rural development programs. In most states we succeeded in conducting interviews with more government officials in charge of rural development programs than we did with officials in charge of CCTs. The questionnaire, and a complete list of names and affiliations of the people interviewed, is available from the authors.

The interviews were conducted in a semi-structured format. There was an introductory statement that provided some background on the project and the purpose of the interviews, and there was then a list of fairly open ended questions that were followed. When the interviewees were interested and engaged, we went through the entire list of questions, sometimes spending an entire morning talking about the specific questions and many other related issues. When the interviewees were time constrained, we moved through the questionnaire more selectively.

The key findings can be summarized as follows:

1. *It is not appropriate to talk about “rural development” programs in generic terms.*

While there is a considerable degree of homogeneity in the conditional cash transfer programs throughout Latin America, the same cannot be said about rural development programs. Rural development policies, and projects, vary over time as well as within and across projects. Several examples serve to make this point.

One way to classify rural development programs is based on how narrowly focused they are. The Program to Strengthen Family Farming (PRONAF), at least in its first decade, was a very narrowly focused program. It was essentially a line of credit targeted to family farms, and it was dominated by production credit. Only later did investment credit and complementary interventions gain importance. IFAD projects, in contrast, are comprehensive integrated rural development projects. They normally take place over a half a dozen years or more in a well-defined set of communities, and they focus on a wide variety of interventions. These include, but are not limited to, community organization, infrastructure, investments to support agricultural production and processing, technical assistance, and the participation of women.

A second example of different approaches to rural development can be found in the contrast between IFAD and World Bank projects in the Northeast of Brazil. In contrast to IFAD’s comprehensive and long term approach, the World Bank supported programs in the Northeast have tended to have a much more narrow focus, but much broader coverage. In the past several decades the World Bank programs have financed access to water and electricity for a significant share of the rural population in the Northeast. They have also focused on other forms of rural infrastructure and the purchase of tractors. The contrast between approaches in the state of Bahia was stark. The IFAD supported project Pro-Gavião operated in just 13 municipalities between 1997 and 2005. The subsequent IFAD funded project—Gente de Valor—was carried out in 34 municipalities. The World Bank supported project—Produzir—in contrast, made investments in 407 out of the 417 municipalities in the state of Bahia. Similarly, in contrast to IFAD projects that involve six or more years of interventions, the director of a World Bank project in a different Northeastern state described a rapid appraisal

approach in which the project team would only spend three days in a community in order to identify demands and elaborate a list of priorities prior to beginning activities.

A final example can be drawn from the evolution of IFAD projects over time. Each individual project often goes through very distinct phases. The directors of Pro-Gavião and Dom Helder were both very clear about this. In the case of Pro-Gavião, for example, the first three years focused much more on infrastructure, whereas the latter phase of the program began to address issues of income generation. Similarly, in the case of the state of Bahia where IFAD is now working on its third generation of rural development projects, the focus has evolved over time. In general terms, Pro-Gavião began with a strong focus on infrastructure, Gente de Valor was more concerned with income generation, and Pro-Sertão is being developed with a clearer recognition of the importance of product chains and marketing channels. While there are also many similarities across these generations of projects, the point is that IFAD projects have evolved over time in response to what was learned from past successes and failures, changing local conditions, and altered state and national political environments.

These examples serve to illustrate the point that there is a broad spectrum of possible designs for rural development interventions, and that they should not be thought of in generic terms. The potential synergies are likely to vary across designs, and thus determining the strength of the synergies is an important empirical question.

*2. The interviews suggest that synergies at the level of the effects of policies on program participants are likely to be important.*

The discussion of synergistic effects of CCTs, rural development programs, and other policies was at the core of all of the interviews. There was no unanimity on exactly which synergies were most important, and how large they are likely to be. There was a general consensus, though, that Bolsa Familia is extremely important for helping poor families meet their nutritional needs, and that by guaranteeing a basic income, poor families—and especially women—might have more time to think about and get involved in productive projects. Because the value of the transfer is small, it is unlikely that BF income directly finances productive investments, but many respondents expressed the view that it may have an insurance function. In times of illness, family

crisis, or other negative shocks, it helps to provide for basic necessities and to avoid a loss of assets.

*3. The interviews suggest that synergies at the level of policy coordination between CCTs and rural development programs are weak, or at best incipient.*

Most respondents agreed that there is little coordination of policies aimed at rural poverty reduction. This is especially true across agencies within a state, and across ministries at the federal level. It is also often true across programs within a single state level agency or a single federal ministry. There are a number of reasons for the lack of coordination.

There may be legal or administrative restrictions that impede the sharing of information. The directors of rural development programs throughout the Northeast do not have access to the information in the Cadastro Único—used to determine eligibility for Bolsa Família—on who is poor and where they are located. This could be extremely useful for designing interventions, identifying locations for projects, learning about the target populations, and avoiding duplication of efforts in gathering information.

In the specific case of Bolsa Família and PRONAF, there are administrative obstacles created by a lack of coordination of government actions at different levels (federal, state, territorial, and municipal). With both programs, the rules and overall policy direction are determined at the national level. The implementation of Bolsa Família is decentralized, and municipal governments play an important role in the creation and maintenance of the Single Registry (Cadastro Único). PRONAF, in contrast, relies quite a bit on agricultural extension agents who have often belonged to State level agencies, or are co-financed with municipalities or a group of municipalities. A shortage of extension agents, and a general lack of funding for their services, creates obstacles to access to credit and the elaboration of successful projects. It is also the case that there is often little interaction between the local branches of government in charge of social programs and those involved with PRONAF.

At a more general level, politics often creates obstacles to coordination and collaboration in a number of different ways. First, interview respondents in several Northeastern states explained that when there was a coalition of parties in power at the

state level, this often led to the division of high level positions and agencies across parties. Agencies were often viewed as fiefdoms, and as spaces to be used for political gain, thus creating obstacles to cooperation. Second, examples were provided of how a single federal ministry, or agencies within a state level secretariat, would sometimes be allocated to different factions from a single party. In this case, political infighting could create obstacles to coordination. A final example that emerged from the interviews relates to the logic of individual politicians. Ministers, Secretaries, as well as Agency and Department heads, all want to take credit for successful policies and projects. This often leads them to treat the policies and projects under their responsibility as proprietary. They want “photo opportunities” for the successful outcomes that they can claim responsibility for. This, too, can create obstacles to collaboration across branches of government.

A promising area where policy coordination does seem to be emerging is through the Brasil sem Miséria program (BSM). This is a signature effort of President Rousseff’s government aimed at eradicating extreme poverty, and thus something that she would like to take credit for at the end of her time in office. As a result of leadership and the designation of priorities from the very highest level of authority, the Ministries of Social Development (MDS) and Agrarian Development (MDA) do seem to have collaborated extensively on this effort. For the first time they have merged databases on who is poor from the Cadastro Único (Single Registry) and who is a family farmer eligible for PRONAF (DAP), in order to target the intersection of the two. Policies aimed at “productive inclusion” have been designed across the ministries with a relatively high level of collaboration and common purpose. While we have doubts about the likely success of the particular package that was implemented, we do think that the degree of policy coordination is a very positive development. Several examples of similar experiences at the state level also emerged in the interviews. A strong governor with a clear set of priorities can also produce a significant level of coordination across different branches of state government. Leadership is a key element.

4. *IFAD projects can have impacts that go far beyond the participants in a specific project by serving as examples of what is possible, and by providing lessons that can potentially be scaled up.*

Two examples provide evidence for this conclusion. First, in the state of Bahia there has been considerable continuity in the leadership of IFAD projects. Augusto Cesar de Oliveira Maynard was the director of all three projects that IFAD funded in the state of Bahia. When we interviewed him in 2013 he explained that he was leading a collaborative effort within the Companhia de Desenvolvimento e Ação Regional (CAR)—the government agency where both the World Bank and IFAD supported programs are housed—to redesign the next phase of the program Produzir, which had been supported by the World Bank. The objective was to scale up many of the lessons from the two smaller IFAD projects that had taken place in Bahia, and to find ways to merge the successful elements of both programs. Although it is too early to tell what may come of this effort, it is an encouraging development. A second example comes from the Dom Helder project which has been supported by IFAD since 2000. Unlike most IFAD projects in Brazil, which were done in concert with state level governments in the Northeast, Dom Helder was executed in collaboration with the federal Ministry of Agrarian Development (MDA). The project is spread across 60 municipalities in six states of the Northeast. When we interviewed Espedito Rufino de Araujo, who has been the director of Dom Helder for over a decade, it was clear that he viewed the significance of the project as far more than the direct effects it could have on the approximately 15,000 beneficiaries. At numerous times throughout the interview, he talked about “providing examples” and “constructing references” for how an integrated, sustained set of policies could assist family farmers to live in the semi-arid with rights, citizenship, and a decent standard of living.

## **5. Conclusions**

This chapter presents the results from a study of synergies between social programs in Brazil—the most important of which is the Bolsa Família conditional cash transfer program—and an agricultural credit program targeted at family farms (PRONAF). The chapter also relies on approximately thirty interviews with government officials that were used to help interpret the econometric results and to place them in a larger context of rural development policies in Brazil.

The econometric analysis provides suggestive evidence of the individual impact of each program as well as the possible synergies between them. The outcome variables

studied were land productivity, agricultural income per family worker, and on-farm child labor. The hypothesis of synergy that was investigated posits that households exposed to both social programs and rural development policies should be able to increase productivity and income, and lower child labor, more than households exposed to only one or neither of the programs. The analysis used a difference in differences methodology with municipal level fixed effects applied to a panel of municipal data drawn from the 1995-96 and 2006 Agricultural Censuses. Because endogenous program placement is always a possibility with non-experimental data of this type, we generally refrain from interpreting the results as causal impacts. The results provide evidence of important correlations and are suggestive of possible causality.

The descriptive portion of the chapter showed that average land productivity among establishments with 500 hectares or less rose by 61% in the ten year period, as a reflection of increased input usage and technical change in the sector. Yet because the value of inputs also increased sharply, real agricultural income per family worker increased by only 43%. Child labor fell from roughly one child working on every two establishments to one child working on every five. These were the outcome variables studied in this chapter. In terms of the program variables, the percentage of farms under 500 hectares with access to PRONAF increased from zero in the baseline data to 12.3% in 2006, and the percentage of farms with access to social programs rose from zero to 14%. 17% of the farms that received social programs also had access to PRONAF, and nearly 20% of the farms with PRONAF also benefited from social programs. In all cases, there was considerable variation across the more than 4000 municipalities that were studied.

The econometric results suggest that where Bolsa Família grew more quickly, child labor declined more rapidly. We have no reason to doubt that this reflects the causal impact of the program. There was also a strong negative relationship between the growth of social programs and the growth of land productivity and income. Additional research should seek to identify whether these associations are causal or not. With regard to the relationship between the growth of PRONAF and land productivity, there appears to be heterogeneity across regions, with a positive relationship in the South and a negative one in the Northeast. Other research has documented a much larger flow of PRONAF resources to the South, and more evidence of potential impacts on productivity there. Thus, the results are suggestive of the fact that PRONAF

resources might be used much more effectively in the South. Finally, we observed no significant relationship between the growth of PRONAF and the growth of income, either for Brazil as a whole, in specific regions or for smaller farms. A plausible explanation is that the growth of PRONAF has been more associated with both the growth in inputs and the growth in the value of output, and that these have offset each other.

In terms of synergies, the econometric results uncovered no evidence to support this hypothesis in the case of child labor. We suspect that this is because Bolsa Família and other government policies have targeted this outcome directly, and have already been quite successful. It is also possible that the policies have opposing effects that cancel out. In contrast to child labor, evidence of positive synergies was observed for the outcome variables land productivity and income, and these results were consistent across regions and when attention was restricted to smaller farms. With both variables, the positive synergies were quite large, with the potential to have a significant impact on income growth and poverty reduction. There are a number of possible explanations for these results. Cash transfers can provide improved access to basic nutritional necessities, and this may permit the beneficiaries of rural development policies to focus more of their time and energy on the success of the projects; cash transfer may have credit and insurance functions that can help relax liquidity constraints and prevent a loss of assets when families are faced with a crisis; or cash transfers may facilitate access to other public services, such as technical assistance. Future research should seek to distinguish between these alternative explanations.

The econometric results also suggest that the aggregate impact of the policy interactions was limited by the fact that a relatively small share of families received both programs simultaneously. While nearly 20% of the establishments that accessed PRONAF also received Bolsa Família, the group that received both programs only represented 2.4% of all establishments under 500 hectares. In order to gain further insight into why this might be the case, we turned to the interviews with policy makers and program directors. We emphasize five key conclusions.

First, there was substantial agreement about the obstacles to poverty reduction that result from a lack of policy coordination. In the period under study, Bolsa Família and PRONAF both expanded dramatically, but with little if any relationship between

them. These were policies that were prioritized by different ministries (the Ministry of Social Development in the case of Bolsa Família and the Ministry of Agrarian Development in the case of PRONAF), with different objectives (poverty reduction and human capital accumulation vs. the development of family farm agriculture), different target populations (the poor vs. family farmers), and different instruments (cash transfers vs. subsidized agricultural credit). In some cases, as with poor family farmers who qualified for PRONAF B, there was considerable overlap in the target populations and objectives. But in general, the isolation of policies at the federal, state and municipal levels appears to be a significant problem. Political obstacles, with their roots in the individual logic of politicians, the heterogeneous governing coalitions that are often formed, or in the archaic practices of traditional elites in the Northeast of Brazil, were also identified as reasons for a lack of policy coordination.

Second, a promising area where policy coordination does seem to be emerging is through the Brasil sem Miséria program (BSM). As a result of leadership and the designation of priorities from the very highest level of authority, the Ministries of Social Development (MDS) and Agrarian Development (MDA) do seem to have collaborated extensively on this effort. For the first time they have merged databases on who is poor from the Cadastro Único (Single Registry) and who is a family farmer eligible for PRONAF (DAP), in order to target the intersection of the two. Policies aimed at “productive inclusion” have been designed across the ministries with a relatively high level of collaboration and common purpose. Several examples of similar experiences at the state level—often led by a strong governor—also emerged in the interviews. Leadership is a key element. An important policy recommendation that emerges from this experience is that the government should seek to extend the use of the Single Registry--which determines eligibility for Bolsa Família--to improve the targeting of a host of other policies aimed at rural poverty and rural development.

Third, it is clear that policy makers face budget constraints and tradeoffs, and that they do not only make decisions as a result of impact evaluations and evidence based research. There is no doubt that institutional constraints, interest groups, and political calculations are important. But it was clear from many of the interviews that policy makers and the directors of rural development programs were hungry for information and evidence. They had no hesitation acknowledging gaps in their information set, and seemed eager to find research and evidence that could help to guide

their decisions. It was also clear that budgetary and political restrictions were not the main obstacles to the success of Bolsa Família and PRONAF. Both programs saw their clientele and budgets grow dramatically since they were created, and both programs were important enough to survive the political transition from the PSDB to the PT governments in 2003 (although with some changing of name and design in the case of Bolsa Família). One of the key obstacles that they both face relates to weak administrative capacity at lower levels of government. The success of both programs relies on collaboration with municipal governments for the creation and maintenance of the Single Registry, and with state and municipal governments for the provision of technical assistance to family farmers. It is at this level that budgets, personnel, and technical and administrative capacity is often lacking.

Fourth, there are some hopeful signs of progress fighting rural poverty in Brazil. A new generation of IFAD and World Bank rural development projects in the Northeast of Brazil appears to be cognizant of the importance of policy coordination. These views were expressed by the directors of these programs, but also by others who do not participate in them. Government officials throughout the Northeast, and in Brasilia, appear to share these opinions. Examples of successful coordination can be found. These seemed to have their roots either in resolute and focused leadership of the President or a Governor, or in a particular state level structure that centralizes the responsibility for coordination in a single agency.

Finally, many officials shared the view that the importance of IFAD rural development projects in the Northeast of Brazil goes far beyond their direct impact on the participants in these projects. IFAD projects can be examples of successful policy coordination, and can serve as references for what is possible with a comprehensive approach and a sustained effort. There is awareness that lessons can be learned from these projects and scaled up to policies that reach a much larger public in the Northeast. We saw evidence of this in Bahia. In this regard, comprehensive rural development projects do not necessarily compete with more narrowly focused policies that can reach a much larger public. The two can be complementary. Yet a degree of caution is in order. If some of the success of IFAD projects does in fact result from the entire package, and the synergies that are created across policies, then scaling up isolated pieces might not work. Quantitative studies, and impact evaluations, should seek to shed light on these issues.

## References

ANDRADE, M ; CHEIN, F e RIBAS, R. “Políticas de Transferência de Renda e Condição Nutricional de Crianças: uma avaliação do Bolsa Família”. CEDEPLAR/UFMG, 2006.

BARROS, R. P. de; HENRIQUES, R.; MENDONÇA, R. O papel das transferências públicas na queda recente da desigualdade de renda brasileira. In: Barros, R. P. De; FOGUEL, M. M.; ULYSSEA, G. Desigualdade de Renda no Brasil: Uma Análise da Queda Recente – Vol. 2. Brasília: IPEA, 2010.

BARROS, R. P. de; CARVALHO, M.; FRANCO, S.; MENDONÇA, R. “Determinantes na Queda da Desigualdade de Renda no Brasil.” Texto para Discussão 1460, IPEA, Rio de Janeiro, janeiro de 2010.

BURGOS, F.; ABREU, K; LINS, E. “La Dimensión Institucional de las Sinergias Entre Programas de Transferencia Condicionada y Programas de Desarrollo Rural: Brasil – Bolsa Família y Pronaf.” Relatório Final, dezembro de 2014.

CAMELO, R.; TAVARES, P. A.; SAIANI, C.C.S. Alimentação, Nutrição e Saúde em Programas de Transferência de Renda: Evidências para o Programa Bolsa Família. *Revista Economia*, dezembro, 685-713, 2009.

CARDOSO, E.; SOUZA, A. PORTELA. “The Impact of Cash Transfer Programs on Child labor and School Attendance in Brazil”, in: Peter Orazem; Guilherme Sedlacek; Zafiris Tzannatos. (Org.). *Child Labor and Education in Latin America. An Economic Perspective*. Palgrave Macmillan, 2009.

COVRE, S.; MARQUES, F.; MATTOS, E. Oferta de trabalho e transferências: Evidências dos efeitos das condições impostas pelo programa Bolsa-Família. ANPEC, 2008.

DOS SANTOS, Ricardo Bruno N. “The Impact of Rural Credit Restriction to Brazilian Farmers”, *Tese de Doutorado, Universidade Federal de Viçosa*, 2010.

FERRO, A. R.; KASSOUF, A. N. Avaliação do Impacto dos Programas de Bolsa Escola na Incidência de Trabalho Infantil no Brasil. ANPEC, 2003.

FERRO, A. R.; NICOLLELA, A. C. The impact of conditional cash transfer programs on Household work decisions in Brazil. In: Population Association of America 2007 Annual Meeting, 2007.

FIRPO, S.; PIERI, R.; PEDROZO JR, E.; SOUZA, A.P. Evidence of eligibility manipulation for conditional cash transfer programs. C-Micro Working Paper Series n. 12/2013, 2013.

FOGUEL, M. N.; BARROS, R. P. The Effects of Conditional Cash Transfer Programmes on Adult Labour Supply: An Empirical Analysis Using a Time-Series-Cross-Section Sample of Brazilian Municipalities. ANPEC, 2008.

GLEWWE, P ; KASSOUF, A. L. The Impact of the Bolsa Escola/Família Conditional Cash Transfer Program on Enrollment, Drop Out Rates and Grade Promotion in Brazil. *Journal of Development Economics* , v. 97, p. 505-517, 2012.

GUANZIROLI, C. E. . Pronaf Dez Anos Depois: Resultados e Perspectivas para o Desenvolvimento Rural. *Revista de Economia e Sociologia Rural*, v. 45, p. 301-328, 2007.

HELFAND, S., L. F. BRUNSTEIN. "The Changing Structure of the Brazilian Agricultural Sector and the Limitations of the 1995/96 Agricultural Census," *Revista de Economia e Sociologia Rural*, Vol. 39, No. 3, July/Sept. 2001, pp. 179-203.

HELFAND, S., A. R. B. MOREIRA, and E. BRESNYAN Jr. "Agricultural Productivity and Family Farms in Brazil: Creating Opportunities and Closing Gaps." Mimeo, April 2013.

HELFAND, S., A. R. B. MOREIRA, and E. BRESNYAN Jr.. "Agricultura Familiar, Produtividade e Pobreza no Brasil: Evidências do Censo Agropecuário 2006," in *Apectors da Agricultura Brasileira: Uma análise Multidimensional com dados do Censo Agropecuário 2006*, edited by SCHNEIDER, Sergio; FERREIRA, Brancolina; ALVES, Fabio, IPEA, Brazil, 2014.

HELFAND, S., MOREIRA, A. R. B., AND FIGUEIREDO, A. M. R. "Explicando as Diferenças de Pobreza entre Produtores Agrícolas no Brasil: Simulações Contrafactuais com o Censo Agropecuário 1995-96." *Revista de Economia e Sociologia Rural*, Vol. 49, No. 2, pp. 391-418, 2011.

HELFAND, S., ROCHA, RUDI, and VINHAIS, H. E. F., "Pobreza e Desigualdade de Renda no Brasil Rural: Uma Análise da Queda Recente," *Pesquisa e Planejamento Econômico*, Vol. 39, No. 1 , pp. 67-88, 2009.

KERSTENETZKY, C. L. Redistribuição e desenvolvimento? A economia política do programa bolsa família. *Dados – Revista de Ciências Sociais*, Rio de Janeiro, vol. 52, nº 1, p. 53-83, 2009.

MACHADO, R. F. T.; SOUZA, A. Efeito do Bolsa Escola sobre Saúde. Efeitos de Alocação IntraFamiliar. Fundação Getúlio Vargas, Escola de Economia de São Paulo. Mimeo, 2008.

MATTEI, L. PRONAF 10 Anos: Mapa da Produção Acadêmica. NEAD Estudos 12. Brasília: MDA, 2006.

REIS, Eustáquio José, Márcia Pimentel, Ana Isabel Alvarenga, Maria do Carmo Horácio dos Santos, "Áreas Mínimas Comparáveis para os Períodos Intercensitários de 1872 a 2000." Paper presented at 10 Simposio Brasileiro de Cartografia Histórica, Paraty, May 10-14, 2011.

RODRIGUES, CRISTIANA TRISTÃO. *Mudanças no Perfil de Pobreza no Brasil: Uma Análise Multidimensional a Partir da Pesquisa de Orçamentos Familiares (POF), 2002-03 e 2008-09*. Ph.D. Dissertation, Federal University of Viçosa, Brazil, January 15, 2014.

SILVEIRA, F.G.; VALADARES, A.A.. “Evolução recente do PRONAF-Crédito – 1999 a 2013. Paper presented at Rede de Estudos Rurais, VI Encontro da Rede de Estudos Rurais, 2 a 5 de setembro, 2014. Downloaded from <http://www.redesrurais.org.br/6encontro/>.

SOARES, F.; RIBAS, R.P.; OSÓRIO, R.G. Evaluating the Impact of Brazil’s Bolsa Família: Cash Transfer Programmes in Comparative Perspective. IPC evaluation note, number 1, December, 2007.

SOARES, S.; SOUZA, P. H. G. F.; OSÓRIO, R. G.; SILVEIRA, F. G. Os impactos do benefício do programa bolsa família sobre a desigualdade e a pobreza. In: CASTRO, J. A.; MODESTO, L. (Org.). Bolsa família 2003-2010. Avanços e desafios, volume 2. Brasília, IPEA, 2010.

SOARES, S.; RIBAS, R. P.; SOARES, F. V. Focalização e cobertura do Programa Bolsa Família: qual o significado dos 11 milhões de famílias? Brasília: Ipea, (Texto para Discussão, n. 1396).

SOARES, S.; SÁTYRO, N (2009). O programa bolsa família: desenho institucional, impactos e possibilidades futuras. Brasília: Ipea, (Texto para Discussão, n. 1424), 2009.

SOUZA, A. P. Políticas de Distribuição de Renda no Brasil e o Bolsa Família. In: Brasil: Bacha, E. e Schwartzman, S. “A Nova Agenda Social.” Rio de Janeiro: LTC, 2011.

SOUZA, A.P.; DUARTE, J.; NEVES, J.; OLIVEIRA, P.; GADELHA, S. Uma Investigação sobre a Focalização do Programa Bolsa Família e seus Determinantes Imediatos. *C-Micro Working Paper Series n. 13/2013*, 2013.

TAVARES, P. A.; PAZELLO, E. T.; FERNANDES, R.; CAMELO, R. S. Uma avaliação do Programa Bolsa Família: focalização e impacto na distribuição de renda e pobreza. *Pesquisa e Planejamento Econômico*, v. 39, n. 1, abril 2009.

TAVARES, P. A. Efeito do Programa Bolsa Família sobre a Oferta de Trabalho das Mães. ANPEC, 2008.

TEIXEIRA, C. G. Análise do Impacto do Programa Bolsa Família na Oferta de Trabalho dos Homens e Mulheres. UNDP/IPC, 2008.