

Understanding the quality of implementation in Bolsa Familia: A look inside the 'black box' of a conditional cash transfer programme

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This paper aims to promote a greater understanding of how the 'black box' of implementation in a conditional cash transfer (CCT) programme interacts with the quality of implementation. The 'black box' of implementation refers here to programme and external factors that could impact the outcome of the programme such as: the capacity of municipalities; the supply of services; the integration of services; geography; political motivations; levels of poverty; and urban versus rural context. By taking data from federal Brazilian datasets related to these factors and administrative data on the quality of implementation from the Bolsa Familia (BF) programme, this paper models associations between the key variables. The findings suggest some nuanced findings on capacity and the nature of poverty in municipalities, which seems to suggest that overall resources are perhaps less important than the approach taken in a municipality to BF implementation. The supply-side appears to matter, both in terms of the quality of services associated with beneficiaries meeting BF conditionalities as well as how they are provided. As a result, the paper suggests that those designing CCTs should perhaps invest more in the supply of services.

Bolsa Familia in Brazil and similar CCT programmes have been copied in Latin America and other continents and countries (e. g. the Philippines, Indonesia, Uganda, India). The evidence on CCTs increasingly concludes that they are successful in raising household expenditure and promote the take-up of health and education services, contributing in some cases to significant reductions in poverty rates. [1, 2] Impact evaluations have increased the understanding of the relationship of the coverage of beneficiaries, targeting of households and incentive levels (level of benefits) in a CCT programme with the effectiveness of these programmes at household level.¹ However, the understanding of which programme and contextual factors influence the success of these programmes remains limited. This in turn limits knowledge on what works in what context, which is of crucial importance as CCT programmes spread across the globe.

This paper seeks to shed further light into the 'black box' of a CCT by reviewing relevant Brazilian federal datasets and modelling associations between key variables. The 'black box' of implementation refers to a range of programme and external factors that could impact the outcome of a CCT programme. Programme variables can refer to the capacity and resources of those implementing BF as well as the provision of health and education services that beneficiaries engage with. External variables consist of political, demographic and geographic factors. With regards to outcomes, the paper looks at the municipal level of implementation and examines the quality of decision-making at the local level in registering beneficiaries and monitoring conditionalities. In

short, the paper wants to understand better how the decentralised approach used in Brazil is contributing to programme outcomes.

About Bolsa Familia

Bolsa Família (BF) is a social development programme that seeks to alleviate poverty and build human capital through providing financial support to households in poverty. BF is a conditional cash transfer (CCT) programme. Households receive financial support as long as they comply with certain conditions such as children's school attendance, vaccinations and regular health check-ups for mothers and their children.[1] Typically, these cash transfers are made directly to the mother in the household, which seems to lead to more investment in human capital building.[3] In addition, the programme seeks to empower beneficiaries by linking them to complementary services.

The BF Programme introduced in 2003 combined federal Brazilian early CCT programmes, Bolsa Escola, Bolsa Alimentação, Cartão Alimentação, and Auxílio Gas, aimed at improving school enrolment, household food consumption, and lowering household costs of fuel respectively. The programme is strongly identified as a policy of the former President Luis Inácio Lula da Silva.[4, 5] It currently covers all Brazilian poor or over 13 million Brazilian households, which is about one quarter of the population.^[5] As such it is the largest CCT of its kind in the world.

An important feature of BF is a decentralised approach to the administration of the programme.[6] The Ministry of Social Development (MDS), created in January 2004, sets overall social protection policy and supervises the implementation of BF. Secretariats in the MDS are responsible for overseeing the programme and its registry; beneficiary selection, payment authorisation, compliance with conditionalities. The Ministry is also involved in training municipal managers; coordinating with other ministerial departments implementing other parts of the government's social policy; and undertaking impact evaluations and wider monitoring.

Municipalities have a wide range of roles including: providing a local point of contact or BF coordinator; registering beneficiaries, monitoring health and education conditionalities; local programme monitoring; and referring BF beneficiaries for other services. As such municipalities are the main interface between BF and beneficiaries.

Interestingly given their importance in the Brazilian federal system, the states have traditionally had a more limited role in BF. [6] They provide mostly training and support to municipalities, though their role has expanded more recently to include more involvement in ensuring the consistency of implementation and some oversight of municipalities. Other parties involved in administering BF include: the Caixa Econômica Federal, which manages the national registry database and provides unique identifiers and electronic payment cards; the Ministries of Health and Education, which have responsibilities for guidance and training of municipal officers on the conditionalities and providing information on compliance to the MDS; the General Controllers Office (CGU), the Federal Audits Court (TCU), and the Office of the Public Prosecutor (MP), which are control bodies and are responsible for formal oversight.

The BF Programme proved to be popular among municipal governments and the general population. The adoption of the program was voluntary but almost uniformly municipalities established the programme. Up to 2008 only four out of the 5564 had not signed an agreement with the federal government to implement the programme.[7]

What is in the black box of implementation?

The literature on BF offers mainly case studies on implementation from different evaluations and articles. Through these case studies, it highlights many programme and external factors as being important in the effective implementation of BF. Studies note issues around: the capacity of municipalities; the supply of services; the integration of services, which interact strongly with geography; political motivations; levels of poverty; and urban versus rural context. These are discussed in more detail below.

Municipal capacity

Municipal capacity is seen as a significant problem in the effective implementation of BF. One study points to difficulty in gathering data on eligible families.[7] Rio Branco, a remote municipality in the state of Acre with a highly mobile population, is an example of severely limited administrative capacity. Before the BF programme the local administration lacked any systematic and up to date registry of its population. The registries that did exist, like the Bolsa Escola registry CADBES, were not compatible and could not be integrated into the Cadastro Unico (the unified BF registry). The local government relied on local civil society including the local university and the federal government in a concerted reform effort that achieved significant increases in targeting. The municipal government of Rio Branco was able to reduce the total number of eligible families by about 30% by updating the registry and deleting double entries.[6]

Moreover, producing data on the compliance with conditions in a timely fashion exceeded the capacities in many municipalities, especially in poor municipalities. In 2005 55% of hospitals reported back data, in 2006 this number increased to 95%.[1] In 2009 the health information for recipients were still only at 63%.[8] This is of course highly relevant for actually enforcing compliance with the conditions. Only in 2007 benefits started being cut because of non-compliance but measuring compliance remains a challenge.[8] Time-lags due to slow capacity building could explain performance of different municipalities. Early adopters of prior programmes like Bolsa Escola (e. g. the cities of Brasilia and Campinas[9]) could have a significant advantage in existing capacity because of their experience and early involvement with similar programmes.

The national government has tried to address this issue in municipalities like Vitoria in the state of Espirito Santo. In Vitoria the local infrastructure was lacking in several respects e.g. staffing, information systems or logistics. The result was an intense overhaul of many local governmental institutions and the adoption of new responsibilities including outreach to families, upgrade of local information technology, establishment of national semi-monthly supervisory meetings, trainings for local staff and coordination with local pre-schools. The results of this overhaul have been very positive. The number of covered children tripled within 2 years, malnutrition among that group was halved to 7% and risk of malnutrition fell to 12%.[6]

Quality of education and health services

Supply-side issues, meaning the insufficient quality of educational and medical institutions, are noted to have a significant negative influence on the impact of CCT's like Bolsa Família.[10] The differences in quality of care and education further increase geographic differences in Brazil. The northeast of Brazil is an area with a less developed infrastructure. Forty nine per cent of all families who are receiving cash transfers through BF live here.[11] The medical and educational infrastructure largely remains insufficient. Public health expenditure per capita in 2006 was 42%

higher in the southeast compared to the northeast.[7] The severe geographical differences exist not only in healthcare but also in the educational sector “In 2000 spending in education per capita was three times higher in Roraima than in Pará and all the states in the northeast were below the Brazilian average. Unfortunately, differences in spending have changed little in the last decade“.[7] Without a proper supply infrastructure, the impact of any intervention is expected to be limited: Conditional cash transfers “can themselves only function properly in terms of strengthening demand for and democratizing access to basic social services such as education and health if the actual supply of such services is adequate in the first place”.[12]

Coordination and integration of services

Coordination between the different levels of government and different local institutions proves to be challenging in many different contexts. Other CCT’s like Youth Agent, a programme for young children in the Brazilian city of Campinas, encountered similar issues including serving families twice or being unable to combine different registries.[13] Lindert identifies three areas of coordination problems: third-party principle agent problems, the heterogeneous quality of implementation and interaction between the BF and other local programmes. For this range of problems he observes different economic (e.g. performance pay for Caixa) and institutional (formal joint agreements) or social (BF award) solutions. To what degree these solutions work or what their specific influences are, is not investigated in detail.[6]

Integration of services is also a clear factor in successful implementation of BF. Integration of services has clear benefits. Beyond a likely increase of effectiveness over time, Fiszbein observes positive spill-over effects to other governmental institutions now using targeting and coordination mechanisms originally designed for the BF in other contexts.[1] Reaching such a state of integration of social policies seems to be a difficult process. In general Sánchez-Ancochea notices a “limited integration between different components of the system.” (309)[7] in local Brazilian administrations. A case study focussing on the implementation of the Bolsa Família Programme in Manguinhos identifies this lack of integration between local governmental and quasi-governmental institutions are a major limiting factor to the programme’s impact and success. Manguinhos is a village in the municipality of Serra in Espírito Santo. Because of a lack of a formal street lay-out or urban infrastructure, the local administration struggled to identify eligible families in the first place. Monitoring the compliance with the conditions, specifically integrating data on medical check-ups, proved to be difficult, leading to a situation where “bureaucracy and parallelism went hand in hand with fragile inter-sectoral integration”[14].

On a national level large scale governmental programmes remain disconnected or run parallel. There are some instances of vertical integration, in which the BF is coordinated with other social programmes including coordinated or joint payments that have seen successful integration.

Some municipalities like Sao Paulo or Belo Horizonte have achieved integration of health, education and employment support by coordinating the efforts of BF with local initiatives. In these municipalities social worker check-ups happen as often as bi-weekly, not only to guarantee compliance but to start human capital building and the move out of poverty. This, however, is not the case in many or most municipalities.[6]

Political motivation

The relationship between political motivation and successful implementation and BF is also important. Minimizing the involvement of the states and organising the project mostly on the national and an empowered municipal level is seen as one of the reasons for the success of the CCT programme in Brazil.[11] Even though BF was closely associated with President Lula, the programme and its predecessors were supported by a large number of political parties. Because of the absence of strong partisan identification, the programme was accepted by mayors of other party affiliations on the local level in many cases.[9] Financial support and the allocation of BF funds do not seem to be determined by party affiliation of the municipalities. Fried compares the number of families eligible for support with the number of families that actually receive financial support through the BF programme. He finds that the variations in the distribution do not correlate with the affiliation of local politicians.[2] Avoiding governors at the state level is seen as beneficial for the BF because of their ability to severely constrain national policies and limit their impact. The direct contracts between the national government and the municipalities circumvented that risk.[11]

However, there also appears an interesting relationship between electoral gain and successful implementation. This can be witnessed when looking at municipal elections and performance in BF: Good performance, or more precisely, absence of “public denouncements of illegitimate inclusion of beneficiaries”, is awarded with a 26% increase in the chance to win the coming election.[15, 16] The positive effect on election outcomes caused by a successful BF Programme seems to be understood by the local politicians, as the performance of the BF Programme is dependent on the respective mayor’s eligibility for re-election. If a mayor is running for a second term, the programme’s impact increases by 36% compared to mayors in their second term (lame duck). This effect is robust when controlling for professional experience and other local effects, like different degrees of poverty.[16] Individual motivation of the involved political actors therefore seems to be a highly relevant factor in the effectiveness of BF.

BF is said to have been used to gain popularity by politicians on the level of municipalities as well.[5] A recent analysis of municipal level data of state elections suggests that the popularity of CCT’s has a positive effect for the incumbent president in general. Interestingly, this effect is independent of party affiliation. This analysis demonstrates how these effects not only favoured Lula but also Serra in 2002, even though Serra still lost the election. There is furthermore a connection to the geographic differences discussed earlier. Zucco observes that “both parties performed better in more developed municipalities when in opposition, and once in office both parties perform better in less developed municipalities. This association holds within almost all of Brazil’s 26 states.”(24)[17] The BF Programme seems to carry a large influence on voting outcome, especially awarding incumbents, if the programme is run well. Similarly to economic growth and recession periods, these voting effects seem to have their largest influence rather short term. An effect on voter realignment cannot be seen.[17] From this perspective, one could hypothesise that a higher priority and thus a better performance in BF operations is expected in municipalities where eligible families make up a larger part of the population.

Municipal poverty levels

Extreme poverty has detrimental effect on the educational impact of BF. Even if the programme achieves its goal of increasing participation in the school system, children of extremely poor families are likely to start with a significant disadvantage in abilities.[1] This could be one of the reasons why

the school system has been largely unable to capitalise on increased attendance and hasn't been able to produce impressive increases in educational parameters.[7] However, the effect on education outcomes is a point of contention as the progress is judged more positively in other studies.[5] The poor and extremely poor furthermore have less access to public medical and educational services, widening the gap between the classes and limiting the impact on health on those most affected by poverty.[18] The number of children per family has been used as a first screening variable by most municipalities (79%), suggesting that a high number of children is positively related to eligibility for BF.[29][16] Health parameters show the persistent inequality in health and access to healthcare between different groups of the population. As a result child mortality, for example, is 138% higher among the indigenous population and 37% higher in the black population compared to the white population.[10]

Targeting is a challenge for many CCT programmes. Overall the BF Programme is thought to be very good at targeting.[8] Still, BF is suffering from significant exclusion rates. Because the BF Programme is based on self-reporting, the families most reliant on the cash transfers might be excluded because they are unable to provide the necessary paperwork.[7, 19] Families in the lowest income class have difficulty producing proof of residence, civil document or food purchase invoices.[20] Reporting on yearly self-income seems to be especially difficult for poor families because of income volatility and the instable and unofficial nature of many working arrangements. Additionally, information about BF and the availability of financial support reaches different households to a different degree.[3] These effects are also suspected by Fiszbein: 'Household constraints', meaning a family's ability to take advantage of the provided governmental assistance programmes, could be a limiting factor on the CCT's impact.[1] Because of these difficulties the population structure, combined with the often related supply-side issues in low-income areas, is thought to have a direct negative impact on the efficacy of the BF.

Urban versus rural context

The urban or rural nature of the place in which the programme is administered may have an impact on the effectiveness of a programme.[3] In the Mexican Oportunidades programme, a nationwide CCT with similar conditions, this has been visible through higher dropout rates among the poorest families that live in remote, mostly rural, areas.[8] However, this does not mean that families in urban environments can take better advantage of the BF Programme. Assessments about poverty alleviation show that urban areas are not at a general advantage when it comes to outcomes. It seems to be rather the opposite: the effect on the urban poor seems to be smaller and less effective in supporting the move out of poverty than the effects on poor families in rural areas, where the program has proven to be more effective.[7] When looking at regional and supply-side issues the effects seem to be multi-layered and in some cases work in contrary directions.

Towards research hypotheses

In summary, the literature, though in places quite anecdotal, suggests a number of hypotheses that can be tested further in the modelling for this paper:

- Low capacity municipalities have poorer quality of implementation of BF
- Larger municipalities with more resources have better quality of implementation
- Good quality service provision is significantly associated with good implementation
- Lack of coordination and integration leads to lower quality of implementation

- There is an association between electoral gain and quality of implementation
- Extreme poverty of the municipality is associated with more problematic implementation
- The rural and urban context should not matter in the quality of implementation

Defining the relevant variables

Brazil lends itself well for a study looking at the ‘black box’ of a social protection programme. Firstly, it is a large country with over 5565 municipalities operating in different environmental and local policy contexts. As such, its size provides an opportunity to see how a federal programme is being implemented across a range of different local contexts. Secondly, Brazil unlike some other mid-income countries has good and recent federal datasets in a number of areas related to the ‘black box’ of implementation covering most municipalities. Finally, BF is one of the few CCTs that have an explicit quality of implementation measure against which all municipalities are assessed, the Decentralized Management Index (Índice de Gestão Descentralizada [IGD]).

This paper analyses these datasets and seeks to establish the associations between programme and external variables and the quality of BF implementation in municipalities. These associations are based on a snapshot analysis of the data covering the period of 2009-2010 or the most recent available data. As such, the analysis is not longitudinal.

Programme and external variables included in the analysis are given in Table 1 and fall into four main categories:

- municipal capacity variables such as per capita municipal budgets and resources (C);
- the provision of services at municipal level including supply-side variables such as the quality of education and health provision and the way services are integrated or not at the municipal level (S).
- political variables such as electoral outcomes and elections (P);
- demographic variables such as poverty levels and ethnicity (D);
- geographic variables such as regions (G);

Most of these variables are collected in the year 2010, except the following variables from the year 2011 - political variables, the health service performance index (IDSUS), basic education index (IDEB), and binary variable for presence of food card programme. Further, these data come from a variety of sources collected using variety of survey instruments. The preliminary 2010 Census poverty estimates are from Ministry of Social Development and Fight Against Hunger, collected by means of the household surveys. The Brazil census classifies population groups mainly on the basis of skin colour and whether they belong to indigenous groups. The data related to electoral outcomes were obtained from the website of Estatística TSE (www.tse.jus.br). These political variables correspond to the results of 2008 municipal elections. The municipal financial information was available from the Secretaria do Tesouro Nacional (Treasury Secretariat) from the Ministerio da Fazenda through a report- Financas do Brasil: Dados Contabeis dos Municipios 2010. We also use data (from year 2010) related to basic social protection services provided through social assistance centres called Centros de Referência de Assistência Social (CRAS).

The health service performance index- IDSUS for year 2011 is a composite index on the scale of 0 to 10. The ministry of health assigns this index after giving consideration to variety of factors including population, socioeconomic background and child mortality. IDSUS encompasses three sub-indices:

Socioeconomic Development (IDSE), Health Conditions (ICS) and Structure of the Municipality's Health System (IESSM). It captures the level of access and quality of health service based on the above three indices and groups the municipalities in six homogeneous groups as per their score.

The basic education index¹ (IDEB) for year 2011 is developed by the Anísio Teixeira National Institute for Educational Studies and Research (INEP) under the Ministry of Education to measure the flow and quality of education on the scale of 0 to 10. We used the IDEB values for the fourth grade students in schools administered by municipalities.

We created composite indices (v3249_total to v3261_total) for relationship between Centros de Referência de Assistência Social (CRAS) and other services, programmes or institutions in the city. Each index on the scale of 0 to 8 was developed from the following conditions and the satisfaction of each condition counted as one point in the index.

1. It has location data (address, phone, etc.).
2. Accepts users referred by this CRAS
3. Forwards users to this CRAS
4. Tracks your referrals
5. Holds regular meetings
6. Information exchange
7. Performs case studies together
8. Carries out activities in partnership

Table 1: Names and codes of the variables available for regression

Variable Code	Details
<i>Revenue and finance related variables (C)</i>	
Top100_GDP	Municipality is in the list of 100 most revenue (GDP) generating municipalities
PC_Budget_Revenues	Per capita budget revenues (R\$)
PC_Transfer_Intergov_Union	Per capita transfers from Federal Government (R\$)
PC_Transf_Intergov_State	Per capita transfers from state (R\$)
PC_SUS_Union	Per capita transfer of Resources Health System (R\$)
PC_FNAS	Per capita transfer of Resources from the National Social Assistance - FNAS (R\$)
PC_FNDE	Per capita transfer of Resources from the National Education Development - ENDF (R\$)
<i>Variables related to other programs (S)</i>	
presence_of_Food_Card	Presence of food card program in the municipality (1: yes, 0: no), Data from year 2011
IDSUS	SUS performance (Health service) index, Data from year 2011
IDEB	Basic Education Development Index, Data from year 2011
v3243_0	Does the municipality have list of beneficiaries of the Bolsa Família Program?
v3244_0	Does the municipality have list of families in violation of conditionalities of education in the Bolsa Família Program?
v3245_0	Does the municipality have list of families in violation of conditionalities Health in the Bolsa Família Program?

¹ Source:

http://download.inep.gov.br/educacao_basica/porta1_ideb/o_que_e_o_ideb/Nota_Tecnica_n1_concepcaoIDEB.pdf

<i>Integration software questions- Does the CRAS have access to following federal computer systems and for what purpose? 0:no access, 1: for consultation/data entry, 2: for both consult/data entry (S)</i>	
v3603_total	CadÚnico- Single Registry for Social Programmes of the Federal Government
v3604_total	Sicon- Integrated management of the Conditionalities of Bolsa Família Program
v3605_total	SIBEC – Citizen benefit system
<i>Type of relationship between CRAS and other entities. Codes 0 to 8 (0: no relationship or entity does not exist, >0 : sum of the relationship indicators) (S)</i>	
v3249_total	Public Units of the Basic Social Protection Network
v3250_total	Covenanted Units of the Basic Social Protection Network
v3251_total	Units of the Special Social Protection Network
v3252_total	Health Services
v3253_total	Education Services
v3254_total	Agencies/ Services related to Labour and Employment
v3255_total	Services and Programs for Food Security
v3256_total	Services and programs of Public Safety
v3257_total	BF Grant Programme
v3258_total	Protection Council
v3259_total	Councils Public Policy and Advocacy
v3260_total	Programs and Projects Digital Inclusion
v3261_total	Non-governmental Organisations (NGOs)
<i>Political variables (P), data from year 2008</i>	
perc_votes_Municipality	Percentage votes won by the party in power in the municipality
suppl_election_municipality	Supplementary election held (1: yes, 0: no)
Same_Party_StateMunic	Same ruling party both at municipal and state level (1: yes, 0: no)
votegt95	Ruling party secured very high over 95% (almost all) of the votes (1: yes, 0: no)
<i>Population related variables (D)</i>	
Total_households	Number of households
log_Total_households	Log(total households in the municipality)
large_100k	Population of the municipality is over 100,000 (1:Yes, 0:No)
<i>Poverty related variables (D)</i>	
perc_Rural_households	Percentage of households that are in rural areas
perc_rural_hhlds_in_ext_pov	percentage of households in rural area that are in poverty
perc_urban_hhlds_in_ext_pov	percentage of households in urban area that are in poverty
perc_males_in_ext_poor	percentage of males in the residents who are in extreme poverty
perc_White_in_ext_poor	percentage of white residents in the residents who are in extreme poverty
perc_Black_in_ext_poor	percentage of black residents in the residents who are in extreme poverty
perc_Yellow_in_ext_poor	percentage of yellow residents in the residents who are in extreme poverty
perc_Brown_in_ext_poor	percentage of brown residents in the residents who are in extreme poverty
perc_Indigenous_in_ext_poor	percentage of indigenous residents in the residents who are in extreme poverty
perc_BlcknIndg_in_poor	percentage of black or indigenous residents in the residents who are in extreme poverty
perc_minority_in_poor	percentage of black, yellow and indigenous residents in the residents who are in extreme poverty

<i>Geography (G)</i>	
Region_N	North (1: if Municipality is situated in North region, 0: otherwise)
Region_S	South (1: if Municipality is situated in South region, 0: otherwise)
Region_NE	Northeast (1: if Municipality is situated in Northeast region, 0: otherwise)
Region_CW	Central-west (1: if Municipality is situated in Central-west region, 0: otherwise)

Table 2: Descriptive Statistics for variables

Variable Code	N	Minimum	Maximum	Mean	Std. Deviation
<i>Dependent variable</i>					
avg_IGD	5565	.13	.97	.79	.08
<i>Revenue and finance related variables (C)</i>					
Top100_GDP	5565	.0000	1.00	.02	.13
PC_Budget_Revenues	5212	364.32	13671.62	1858.80	915.39
PC_Transfer_Intergov_Union	5212	.00	11548.69	929.51	577.59
PC_Transf_Intergov_State	5212	.00	8259.79	443.28	452.22
PC_SUS_Union	5212	.00	813.86	105.89	56.03
PC_FNAS	5212	.00	120.85	13.99	13.00
PC_FNDE	5212	.00	630.67	38.24	20.71
<i>Variables related to other programs (S)</i>					
presence_of_Food_Card	5565	.00	1.00	0.11	.32
IDSUS	5563	2.50	8.37	5.65	.84
IDEB	4960	1.40	8.60	4.42	1.01
v3243_0	4437	.00	1.00	0.06	.23
v3244_0	4437	.00	1.00	0.16	.35
v3245_0	4437	.00	1.00	0.20	.39
<i>CRAS integration</i>					
v3603_total	4421	.00	2.00	1.12	.76
v3604_total	4421	.00	2.00	.93	.79
v3605_total	4421	.00	2.00	.88	.81
<i>Type of relationship between CRAS and other entities</i>					
v3249_total	4437	.00	8.00	4.83	2.82
v3250_total	4437	.00	8.00	2.40	2.90
v3251_total	4437	.00	8.00	3.39	3.19
v3252_total	4437	.00	8.00	5.39	2.07
v3253_total	4437	.00	8.00	5.05	2.23
v3254_total	4437	.00	8.00	1.44	2.22
v3255_total	4437	.00	8.00	1.79	2.51
v3256_total	4437	.00	8.00	1.63	2.27
v3257_total	4437	.00	8.00	6.07	2.27
v3258_total	4437	.00	8.00	5.95	2.15
v3259_total	4437	.00	8.00	3.76	2.95
v3260_total	4437	.00	8.00	2.53	2.63
v3261_total	4437	.00	8.00	2.16	2.69

<i>Political variables</i>					
perc_votes_Municipality	5555	21.76	100.00	57.03	13.82
suppl_election_municipality	5564	.00	1.00	.02	.15
Same_Party_StateMunic	5564	.00	1.00	.16	.37
vote95	5555	.00	1.00	.05	.22
<i>Population related variables</i>					
log_Total_households	5565	5.48	15.09	8.20	1.14
large_100k	5565	.00	1.00	.05	.22
<i>Poverty related variables</i>					
perc_Rural_households	5565	.00	.95	.35	.21
perc_rural_hhlds_in_ext_pov	5565	.00	.86	.16	.15
perc_urban_hhlds_in_ext_pov	5565	.00	.48	.09	.08
perc_males_in_ext_poor	5565	.00	.75	.50	.03
perc_White_in_ext_poor	5565	.00	1.00	.39	.22
perc_Black_in_ext_poor	5565	.00	.59	.08	.06
perc_Yellow_in_ext_poor	5565	.00	.22	.01	.01
perc_Brown_in_ext_poor	5565	.00	1.00	.50	.20
perc_Indigenous_in_ext_poor	5565	.00	.94	.02	.08
perc_BlcknIndg_in_poor	5565	.00	.94	.10	.10
perc_minority_in_poor	5565	.00	.94	.11	.10
<i>Geography</i>					
Region_N	5565	.00	1.00	.08	.27
Region_S	5565	.00	1.00	.21	.41
Region_NE	5565	.00	1.00	.32	.47
Region_SE	5565	.00	1.00	.30	.46
Region_CW	5565	.00	1.00	.08	.28

The quality of implementation is assessed by looking at the IGD score of each municipality. The IGD was introduced in 2006 by the MDS to measure the quality of municipal implementation and to incentivise municipalities to improve performance. [6] The IGD combines aspects of the demand for services with supply of services. The index is calculated on the basis of the sum of four components which have equal weight in calculating the index (each 25%), the components are: the share of families with a complete and consistent registration; the share of families with registries updated at least within the last two years; the share of families with complete information on compliance with health conditionalities; the share of children in the programme with complete information on compliance with education conditionalities (as a share of all BF children ages 6-15). The sum of these components is then divided by four.

On the basis of the IGD score, municipalities can receive additional programme resources. This incentive is available for a score over 0.8. Initially, these resources would consist of an increased quota to register new families as the BF programme worked with individual quota for municipalities. However as the coverage of the programme has expanded, municipalities have been given more discretion on how to use these additional resources. The number of municipalities that qualify for additional programme support has increased as IGD scores have improved over time.

This paper looks at the whole IGD as an outcome measure, because it aligns our model with how Brazilian policy-makers assess the quality of implementation and incentivise municipalities.

Figure 1 gives a sense of the distribution of IGD scores across municipalities for the period 2009 - 2010 and suggests a clustering of municipalities around the 0.8 quality threshold.

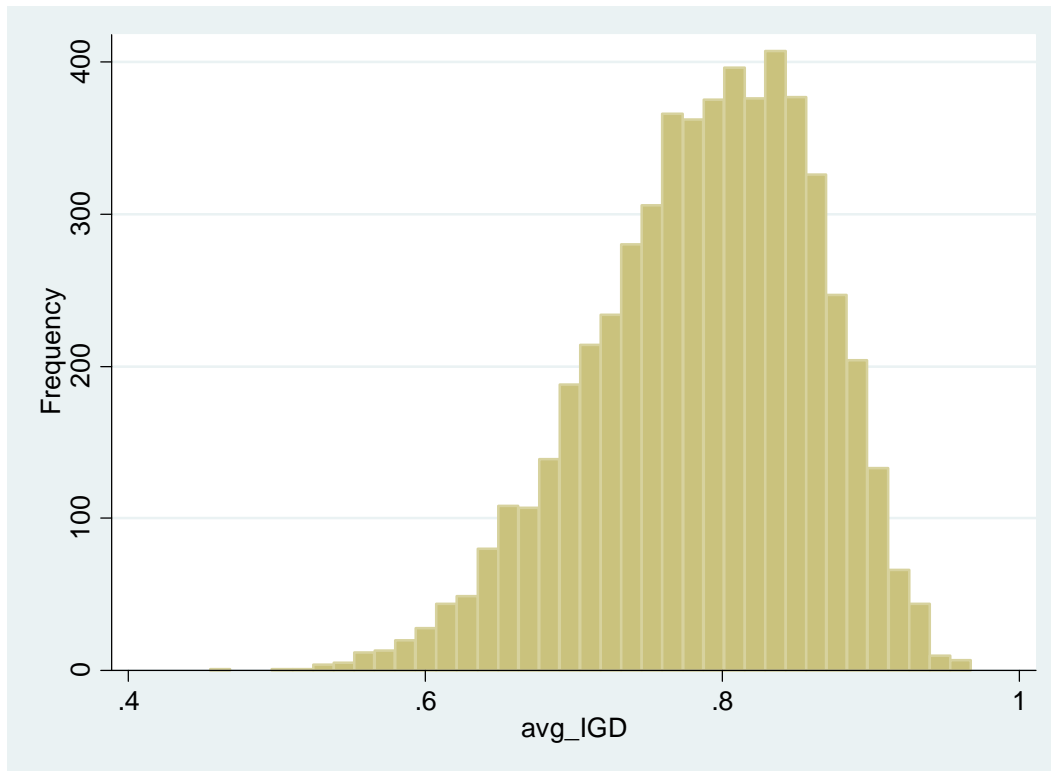


Figure 1: Average IGD scores across Brazilian municipalities in the period of January 2009 to October 2010

Modelling the associations between variables

Regression analysis was used to examine the associations between the various variables. The programme and external variables were taken as independent variables and the IGD as a dependent variable. The IGD score for each municipality and its components were used as the dependent variables in the analysis to test their correlation with other capacity (C), supply-side (S), demographic (D), and political (P) variables. These dependent variables are the averages of scores over time (from January 2009 to November 2010). Further, the values are between 0 and 1, hence the regression technique used must account for it. We used a generalised linear model (glm) for our data analysis.

The glm can be denoted as:

$$g(\mu) = \sum_{k=1}^K \beta_k X_k$$

In this model μ is the expected value of the dependent variable and $g(\mu)$ is a smooth and invertible link function. The logit link function defined as $g(\mu) = \log[\mu/(1-\mu)]$ is used to transform μ which is

confined in the interval $[0, 1]$ to entire real line from $-\infty$ to ∞ . The error term or the random component of the glm model specifies the conditional distribution of the dependent variable given the values of the independent variables X . For our data we use binomial distribution (family) which is more suitable for dependent variable in $[0, 1]$. The glm model is estimated using maximum likelihood estimation. We use STATA² to estimate the generalised linear model (glm) with a logit link and the binomial family as proposed by Papke and Wooldridge. [22]

In the model building exercise we gradually included variables one by one and retained only those variables which were significant at the 90 % level of confidence. The number of observations for the model depends on the missing values in the independent variables. For example, the average value of IGD across months for the municipality Nazária, PI (IBGE= 2206720) is very low, because of zero scores in the initial months. Similarly, there are 34 municipalities for which the IGD score in October and November 2010 is missing. These municipalities were excluded from the regression analysis.

Limitations

The approach chosen has a number of limitations. Firstly, the datasets included do not all cover the same period as indicated in Table 1. For example, the political variables correspond to the year 2008, the basic education development index is for the year 2011, while most of the other variables are from 2010. There are practical reasons for this, which relate to when this data is collected by the Brazilian government and made available. As such, the model may not capture specific or subtle changes in the datasets. In some ways, the expectation inherent in the model is that certain variables such as municipal capacity, quality of services, integration of services, and poverty are unlikely to show significant changes in a relatively small number of years. Nonetheless, Brazil has shown rapid social changes and there is a risk that our model may not capture specific and substantial changes.

Similarly, the model offers a snapshot rather than a longitudinal picture. As such, it does not show trends over time between a range of variables. For instance, it cannot reflect on changes in macro-economic conditions or specific changes in government budgets. Secondly, the municipal datasets are not all complete. As such, we had to exclude some municipalities from the analysis. This may create a small bias if this exclusion is systematic as a result of correlation between missing data and implementation.

Thirdly, the datasets as outlined in Table 1 do not cover all relevant variables that make up the 'black box' of implementation. The model uses proxy variables that may only capture factors to a certain extent. For instance, municipal capacity is likely to extend beyond the resources a municipality has and includes aspects such as the experience and skills of staff, which we do not measure. Moreover, the model does not include variables related to other actors in implementation such as the federal and state government and audit bodies. There are no variables related to accountability and oversight. Finally, there are no variables capturing social capital in Brazilian municipalities.

Fourthly, the model uses the IGD as an outcome measure. This measure is self-reported in parts by the municipalities. As such, it is open to gaming and may not be as reliable as data gathered in a more controlled manner such as through household surveys. Furthermore, there seems quite a bit of variation or volatility in the monthly IGD score of municipalities over a certain period. To smoothen

² see details at: <http://www.stata.com/support/faqs/statistics/logit-transformation/>

out some of the volatility in the reporting of the IGD the modelling approach presented here took an average of the IGD score over a period of about 18 months as explained earlier. Though this may give a more consistent picture of performance over time, it may not counter a determined effort by some municipalities to misrepresent their quality of implementation, especially given the incentive associated with a score over 0.8.

Fifthly, the model captures associations and cannot be specific on direction of causality. As such, it is hard to know whether the quality of implementation is caused by a specific factor such as the level of poverty or whether poor quality of implementation influences the level of poverty. Finally, several of the factors included in the analysis may be interrelated. For example, the capacity of a municipality may influence the quality of services, which may influence the integration of services. Such interdependencies need to be taken into account when interpreting the model and findings.

Findings

The model shows the associations between the key independent variables and dependent variable (quality of implementation) included in the model. Table 3 present the outputs of the final model. The log pseudo-likelihood for final model (-1314.81) is much higher than that for the constant only model (-1987.27) indicating a better model fit than the constant only model. We use this information for the analysis of deviance (analogue to the ANOVA for linear models). The residual deviance for a glm is defined as: $D_m = 2(\log L_s - \log L_m)$, where $\log L_m$ and $\log L_s$ are the log of maximum likelihoods for the given model and the saturated (one parameter to each observation) model respectively[21]. The residual deviance for constant only model (D_c) is also called as the null deviance and it can be used to estimate R^2 , which represents the proportion of the null deviance accounted for by the final model. The R^2 is estimated as: $R^2 = 1 - (D_m - D_c)$. We find that the final model has R^2 value of 0.61.

Table 3: Significant results from model

Description	Coeff.	Std. Er	Z	P	95% CI	
Basic Education Development Index	0.0236	0.0090	2.63	0.009	0.006	0.041
Health service index	0.0328	0.0087	3.77	0.000	0.016	0.050
Indicator for CRAS relationship with Education Service Agencies (score 0 to 8)	0.0065	0.0032	2.00	0.045	0.000	0.013
Indicator for CRAS relationship with Bolsa Familia program (score 0 to 8)	0.0081	0.0032	2.53	0.011	0.002	0.014
Binary (ruling party in municipality got more than 95% votes)	-0.0819	0.0372	-2.20	0.028	-0.155	-0.009
Percentage votes for the winning party	0.1652	0.0555	2.98	0.003	0.056	0.274
Binary variable : Presence of food card in the municipality	0.0767	0.0187	4.10	0.000	0.040	0.113
Percentage of "Yellow" people in poor	1.0069	0.5404	1.86	0.062	-0.052	2.066

Percentage of “Brown” people in poor	0.3383	0.0398	8.49	0.000	0.260	0.416
Percentage of rural households in extreme poverty	0.4509	0.0678	6.65	0.000	0.318	0.584
Log(per capita budget revenues)	-0.1013	0.0275	-3.69	0.000	-0.155	-0.047
Log(per capita transfers from Federal Government)	0.0697	0.0260	2.68	0.007	0.019	0.121
Log(per capita transfers from State)	-0.0235	0.0094	-2.51	0.012	-0.042	-0.005
Log(per capita transfers from National Social Assistance)	0.0081	0.0022	3.61	0.000	0.004	0.012
Log (Total households in the municipality)	-0.1145	0.0087	-13.24	0.000	-0.131	-0.098
Binary (Municipality in NE region)	0.2397	0.0198	12.14	0.000	0.201	0.278
Binary (Municipality in CW region)	-0.0745	0.0213	-3.49	0.000	-0.116	-0.033
Constant	1.9071	0.2205	8.65	0.000	1.475	2.339
Number of observations: 3,777						
Log pseudo-likelihood = -1314.81						
Deviance =73.06						
Log pseudo-likelihood (constant only model) = -1987.27						
Deviance(constant only model) = 187.169						

These findings are then discussed in light of the research hypotheses developed earlier in the paper on the basis of a review of the literature.

Municipal capacity

The expectation was that low capacity was associated with poor quality of implementation. The model presents some conflicting evidence and it indicates that this may be the case to some extent. Capacity here is measured mostly by transfers and municipal revenues. Municipalities that have lower transfers from the federal government and the National Social Assistance Fund also have lower quality of implementation scores. As such there is a positive association between such transfers and the quality of implementation index (IGD). However, not all relevant variables show a positive correlation. Transfers from the states and per capita budget show a negative association with quality of implementation.

How can this be explained? States have a relatively minor implementation role in BF. They have mostly a supporting function in BF implementation. They support municipalities through training and technical support. One possible explanation is that state transfers are made available to poorer performing municipalities. As such, the model may be capturing a more targeted approach by states to make funds available to those municipalities with problems implementing BF to a high standard and as a consequence larger state transfers would logically be associated with poorer performance of the municipalities.

In terms of per capita budget, the model suggests that those municipalities with more resources per citizen also have a worse IGD score. Intuitively, this result does not make sense as one would expect better resources to lead to better administrative capacity or service delivery and then better programme implementation. There could be two explanations. It could be the size of municipalities implementing BF. The second could be targeting financial support. The literature appears to suggest that more targeted support can have a significant impact. [6] Therefore, one could surmise from the modelling results that targeted transfers with specific aims (e.g. training and infrastructure improvements) are likely to be more important in raising the quality of implementation of BF than overall municipal resources. This would also speak to raising the quality of supporting or complementary services.

Size of municipality

The expectation was the larger municipalities with better resources would also show better quality of implementation. However, the model seems to suggest otherwise. The number of households in a municipality appears to be negatively correlated with the IGD score as is per capita budget. Moreover, there is no relationship between IGD score and municipal or state GDP per capita. The results seem to suggest that 'smaller may be better'. There could be good reasons for this. It may be difficult to reach all beneficiaries in large municipalities due to distances between populations, the presence of isolated communities, and the occurrence of violence in communities. In other words, access to services may be easier in smaller municipalities. The provision of services may also be uneven, which may affect the quality of registration and checking of conditionalities, which make up the IGD score. The organisation of BF implementation may be less complex in smaller municipalities than in larger municipalities. It may also be the case that BF implementation is not a sole priority in larger and better resourced municipalities. The poorest may compete with other groups for political influence and indeed access to services.

Quality of services

An important aspect of municipal capacity is the quality of services. As discussed above, it may be that the quality of services and how services are provided is the best way to reflect on municipal capacity in a CCT.

The literature suggests a correlation between quality of services and the IGD. [10] The model confirms this association. Municipalities with a better quality of health and education services according to the indices also have a better IGD score. The index of health (IDSUS) is a synthetic score consisting of coverage of health services (e.g. number of service providers as a proportion of the population) as well as outcomes (examples are vaccine rates, live births, and cervical smears), while the education index (IDEB) measures student performance on standard tests. These associations seem to indicate the importance of the supply of service (as represented in the indices) in CCT programme design also noted in the growing body of evidence on the effectiveness of CCT programmes globally.[12]

Integration and coordination

Similarly, studies suggest that integration and coordination of services remains limited and suggest that such integration is important in good programme implementation.[7] Such integration and coordination are hard to measure and as such to model. Using data from a survey of local social assistance offices (CRAS), the model shows strong associations between particular aspects of

integration and the IGD score. In particular, the associations between the IGD score and the level of integration of the local social assistance offices or CRAS in the BF programme and between the IGD index and the level of integration between the CRAS and education agencies seem significant. Level of integration here means deeper integration of service provision (e.g. being able to register BF beneficiaries in CRAS, cross-using of databases at municipal level; and using BF to assign beneficiaries to complementary services) as captured in the CRAS survey are associated.

Municipalities with deeper specific integration also have higher quality of implementation scores. This finding is interesting as it reflects not just on the quality of services but also on how services are provided. However, this finding is not significant for all areas of integration and coordination. Other factors such as integration with health services and other social agencies show no significant association with the overall quality of implementation index. This may indicate either that collaboration between specific parts of public administration is more critical to successful BF implementation or that certain programmes are just not particularly complementary.

Politics

One assumption is that BF could be used for political gain. There is an expectation that better implementation could be associated with specific political parties being in power or specific election results. The model similar to the literature (see e.g. Fried[2]) does not find a significant association between the political party and the quality of implementation. This finding suggests that BF has become broadly embraced across the political divide. Certain political parties are no less likely than others to show specific quality of implementation of BF when in power. However, the election result does seem to matter. This again is similar to the literature.[15, 16] The model suggests that the electoral majority of the winning party in municipal elections is associated with a higher IGD score.

There are number of possible explanations. Firstly, those with a larger winning percentage could be perceived to have a mandate to make changes and as such promote more effective administration of BF. This explanation would suggest a time lag between election and improved IGD score, which the snapshot approach in this model cannot capture. The absence of a time lag in the data suggests that the causal direction may be reversed, namely that better quality of implementation of BF is associated with a higher winning percentage in local elections. In other words, political parties in power by promoting better implementation of BF before the election could achieve better electoral results. This explanation makes sense giving the small time lag in the data sets, with the model including municipal election data from 2008 and IGD data mostly from 2010. The model has a further interesting finding. It finds that incumbent parties that win more than 95 per cent of the vote also in principle show a lower municipal IGD score. This would suggest an absence of political competition is not helpful in promoting good programme implementation as such. Maybe, the issue is that political actors who achieve a very significant electoral majority become complacent in delivering services.

Poverty and ethnicity

Following from the capacity argument, a hypothesis is that those municipalities with higher levels of poverty or significant groups of ethnic minorities would have lower quality of implementation. The reason for this as noted by Fiszbein could be that poorer households are less able to take advantage of a programme.[1] The model does not find a significant association between overall municipal poverty levels and quality of implementation. However, the model finds some significant

associations between the number of households in subgroups living in poverty and the overall municipal IGD score. Those subgroups are specific groups of coloured individuals as classified in the Brazilian census and the rural poor. The relationship tends to be positive rather than negative. This finding would go against what was assumed in some studies earlier. An explanation could be specialisation. It may mean that municipalities with specific types of poverty would prioritise BF implementation more than others. In other words, it may be a reflection of the local salience of BF implementation given the policy context. Local administrators and politicians may have more of an incentive to raise the quality of implementation. As such, the implementation issue may be less the intrinsic nature of poverty, which is discussed as a main factor in explaining beneficiary take-up of CCT programmes[1], but more about how services are delivered as part of BF.

Specialisation may also be self-reinforcing under the BF programme given the performance incentive in the BF programme. Fiszbein sees a positive impact from these incentives on the way social programmes and other administrative tasks are organised. [1] Municipalities with better implementation receive a higher quota or additional programme resources, which may also increase the performance gap with relatively poorer performing municipalities. Part of the performance gap could also reflect on the prior experience of some municipalities with the predecessors of the BF programme, such as Bolsa Escola.

Geography

The specialisation finding seems to some extent corroborated by looking at the relationship between geography and IGD implementation. Municipalities in the northeast tend to have higher poverty levels than those in other regions. The model finds a positive relationship between municipalities in the northeast and central west and the IGD score compared with others in other regions. Once more, it could reflect on the importance of BF and the quality of implementation in specific regional and demographic contexts. However, the geographic variable more generally has limited significance as the other regional and state variables in general do not have significant associations with the IGD score.

The model finds no significant association between IGD scores in rural and urban areas informing a debate in the literature on how such contexts affect enrolment and implementation.[3] [7] The model suggests there is no strong evidence using the IGD measure of differences in quality of implementation between such contexts.

Conclusion

The findings suggest that despite the limitations of our approach using the quality of implementation index (IGD) of BF as an outcome or dependent variable appears viable. The results of the model are plausible and seem to largely fit observations made in the literature. This may be a function of the size of Brazil and the number of municipalities. Even if the self-reported data of certain groups of municipalities contain inaccuracies, they may be cancelled out by the sheer number of data points in our model. As such, the approach implies that evaluations could pay more attention to self-reported data that is collected as part of a CCT programme. This data lends itself well to understanding programme and contextual factors that influence the effectiveness of a CCT. Such factors are not readily captured in a systematic way in impact evaluations. As a further step, models using the IGD could be enhanced by aligning this outcome information with information that is collected independently from the programme such as household survey data. The main restriction in looking

at this relationship is the way evaluations of CCTs are currently set up and designed. Models using the IGD could also be enhanced by looking at the constituent components of the IGD. This model looked at the IGD as a whole, but further analysis could look at the IGD as consisting of components reflecting on the demand from claimants in the BF programme and the supply of services to support the conditionalities of the programme. This would allow for better differentiation between the key components that make up the quality of implementation measure.

The model also produced some nuanced findings on capacity, which seems to suggest that overall resources are perhaps less important than the approach taken in a municipality to BF implementation. In terms of the supply-side, the model finds that not only the quality of service delivery is associated with the quality of implementation of BF but also how services are delivered. The latter speaks to specific integration and coordination of services, especially between outreach centres (CRAS) and the BF programme. Furthermore, the model implies some specialisation of municipalities in BF. This could be explained by the relative importance of BF in a locality. Certainly smaller municipalities with higher levels of poverty and more minority groups within their population show no worse quality of implementation scores than others and in specific instances significantly higher scores. This could speak to range of issues in service delivery: smaller municipalities may be able to provide services closer to the citizen, which may be especially useful in targeting the poorest of the poor; such municipalities may have more control over a system that requires coordination between social, health and education services, and non-governmental actors; and/or administrators and political leaders in smaller municipalities with a larger number of poor people as a proportion of the population may have a greater incentive to enrol households in BF and improve the quality of implementation. The latter would speak to a form of specialisation in BF implementation, which may be self-re-enforcing given the incentive offered to good performing municipalities under the BF programme. A further implication is also that the nature of poverty itself may not influence enrolment that much and the provision of services and the quality and nature of service provision may matter more.

The model as could be expected of a meta-review of Brazilian datasets raises a number of questions. This speaks to the findings in two ways. Firstly, this approach is useful in understanding risk factors in CCT implementation. These risk factors reside in all categories of variables that were included in the model. Understanding the risks could lead to: additional technical support for municipalities and service provision at municipal level; guidance on integration of services at municipal level; and specific support programmes for larger municipalities with more complex service delivery among others. Secondly, it could inform further research at the level of the municipality to understand some of the dynamics that the model implies. For instance, a link between student outcomes and the quality of implementation is interesting but does not explain the direction of causality or the factors behind each such as quality of local civil servants and teachers that could be contributing to this positive association. The key to improving our knowledge of how programme and external factors influence the quality of implementation is to understand the dynamic that sits behind some of the positive associations that the model identifies, especially when they are less intuitive.

Finally, there is a question how actionable these findings are for policy makers. An important lesson can be drawn from this model. The supply-side appears to matter, both in terms of the quality of services associated with beneficiaries meeting BF conditionalities as well as how they are provided. Here policy-makers can and perhaps should invest a larger proportion of CCT resources.

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