An Analysis of Income Inequality Reduction in Brazil Under President Lula da Silva

Victoria Rose Belcher
AN ANALYSIS OF INCOME INEQUALITY REDUCTION IN BRAZIL
UNDER PRESIDENT LULA DA SILVA

By

Victoria Belcher

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Approved:

Dr. Douglas Woodward
Director of Thesis

Dr. Martine Jean
Second Reader

Steve Lynn, Dean
For South Carolina Honors College
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My interest in studying income inequality in Brazil started during my study abroad in Salvador, Brazil in the Northeast of the country in Spring 2016. Before arriving, I was aware that Brazil’s economy had seen a major boom prior the recession that began in 2015. From my short time in the city, it was apparent that Salvador was rapidly changing, but I became doubtful of how this development was impacting all citizens. Extravagant shopping malls and luxurious amenities seemed to arise everyday; however these spaces were primarily accessible to white, upper class citizens, which account for less than 10% of the city’s population. Moreover, I had the unique opportunity to study abroad in Brazil during a major shift in the nation’s political structure, the impeachment of President Dilma Rousseff. Rousseff’s impeachment coincided with corruption charges against her predecessor, Luis Inácio Lula da Silva (Lula). As Rousseff was considered Lula’s handpicked successor to the presidency, these charges of corruption destroyed the credibility of the Workers’ Party, a leftist political party founded by Lula. Corruption allegations also led to increased critical reflection of both Lula and Rousseff’s accomplishments, because it seemed impossible that a person bribed by a large company could also fight for the citizens of the nation.

During this Workers’ Party’s time in power, issues surrounding race and gender were brought to light, new social programs were introduced meant to benefit the poorest citizens in the country, and national income inequality greatly decreased. I came across a government report with GINI scores, a measure of income inequality, for Brazilian municipalities from 2000 to 2010, a time frame that includes the full duration of Lula’s presidency. With this information, I would be able to conduct an economic analysis showing how Brazil changed under Lula’s administration, and how policy objectives compared with economic outcomes. I felt it was
important to bolster this economic analysis with extensive background about Lula’s rise to power and existing causes of income inequality in Brazil in order to contextualize these economic changes.

My thesis begins with background information on the importance of studying income inequality, and the negative ramifications of high-income inequality. I provide an overview of the significance of Lula’s election, as well as a brief discussion of the social and economic policies he introduced as president and how these policies encourage engagement with the formal sector. My thesis presents empirical analysis of variations in income inequality reduction across the different regions of the country. Through this research, I was able to observe how greatly income equality varied across different regions in Brazil and how different regions were markedly more successful at reducing income inequality. Finally, I conduct a regression analysis to determine the role of regional differences and engagement with the formal sector to analyze what factors contribute to the variations in income inequality reduction across municipalities.

Through this research, it became apparent that despite a national trend of inequality reduction, this positive change did not impact all citizens of the country. In fact, it seemed to favor regions of the country with greater levels of capital and engagement with the formal sector development. My thesis results pave the way for future research on the factors that inhibit inequality reduction in Brazil. Furthermore, this thesis makes the case that with such variation across regions in levels of inequality, a national policy aimed to reduce income inequality must allow different regions and municipalities to customize their efforts to best fit the needs and issues facing their citizens.
ABSTRACT

This thesis analyzes trends in income inequality reduction across different regions of Brazil from 2000 to 2010. This period was selected because it was a period of consistent economic growth and national inequality reduction, as measured by the GINI Index, as well as a period that witnessed the introduction of new government policies by President Lula da Silva. This thesis provides extensive background information about Lula’s presidency and income inequality in Brazil before conducting an economic analysis of the trends in income inequality reduction through the country. This thesis concludes that the trend of inequality reduction favored certain regions of the country and also favored municipalities that were more adept at encouraging participation in the formal sector. This means that although the North and Northeastern regions of the country received the highest amount of new government benefit payments, the regions were still less successful at reducing income inequality than the more historically wealthy regions of the country. The ramifications of this research show that although income inequality generally decreased during this time, greater national effort is needed to address the structural and historic factors that perpetuate regional inequality in Brazil.
BACKGROUND

In the field of economic development, Brazil’s progress in the first decade of the 21st century is often considered a model for how a country can achieve a development model that reduces poverty and promotes equality. Empirically this praise is warranted. In 1983, nearly half (49.3%) of Brazil’s citizens lived on under $3.10 a day and according to the most recent figures (2014) from the World Bank, only 7.56% of the countries citizens fell below this poverty line (World Bank). The GINI Index is a tool used by economists to measure relative inequality in a country by calculating how income is distributed amongst a country’s citizens. A nation with perfect equality would have a GINI Index of zero; meaning that every citizen has the same income, and a perfectly unequal nation would have a score of 100, meaning that one individual controls all of the income in the nation. Per the World Bank, in addition to reducing poverty levels, Brazil has also reduced income inequality from its all-time high GINI Index of 63.3 in 1989 to 51.48 in 2014 (World Bank).

Figure 1

![Brazil GINI Index](image)

Source: World Bank 2017
Notably, the most sustained period of decline in inequality shown in Figure 1 occurred from 2001 to 2009 reflecting both an upswing in economic climate as well as a series of progressive social policies implemented by President Lula da Silva. The reductions Brazil witnessed in poverty and inequality were accompanied by major shifts in Brazil’s economic system as well as demographic structure. In the past 50 years the percentage of Brazilians living in urban areas has jumped significantly from 46% to 85% (World Bank). Figure 2 below demonstrates Brazil’s percent urban population compared to that of the United States, showing the extreme change the country has seen in urban-rural structure.

**Figure 2**

Source: World Bank 2017

Of all the policies implemented by President Lula da Silva, *Bolsa Família* is the program that has gained the most international recognition. The program, which was introduced in 2003, is a conditional cash transfer program that combined previous welfare programs into a more cohesive program meant to alleviate the impacts of poverty on low-income Brazilians. Participants in the program must register in their respective municipality and adhere to certain program standards to continue to receive benefit payments. These standards include minimum
health and educational requirements for children, which will be discussed in the Bolsa Família section of this paper. Bolsa Família currently provides payments to 13.9 million Brazilian families, roughly one quarter of the country’s population (‘Bolsa Família’). The success of this program has led many other countries to adopt condition cash transfer payment models in their national development plans. In 2004, the United Nations, World Bank, and Brazilian government launched the Brazil Learning Initiative for a World without Poverty to share the results and lessons Brazil learned from Bolsa Família with the rest of the world (‘What is WWP?’).

While Bolsa Família has generated results, and Brazil as a whole has seen reductions in poverty and inequality, the dialogue on Brazil’s development often stops there. At the most basic level, a decreasing GINI coefficient represents an increase in wages for low-income citizens, however, the formalization of the Brazilian labor market and other economic changes are less studied in academic literature on this time period. The purpose of this research is to shed light on the huge variation Brazil witnessed in inequality reduction across different regions and within regions of the country during the 2000 to 2010 timespan and to evaluate the historic and cultural factors that explain this variation. A one-size-fits-all poverty reduction plan, such as Bolsa Família, will inevitably have different levels of effectiveness based on existing structural and social norms within a given region. Across the 5,565 municipalities in Brazil, from 2000 to 2010, 1133 saw no change or an increase in income inequality according to their respective GINI scores (Instituto de Pesquisa Econômica Aplicada et al.). In order to have a better understanding of Brazil’s economic and social development, it is important to look at results at between regions, acknowledging that inequality in the bustling metropolis of São Paulo has a different form than in a sparsely populated town in the Amazonas region of the country. This research begins with a broad literature review discussing the general body of knowledge on income
inequality before focusing on the historical context of economic and social development in Brazil, the structure of Bolsa Família, and a statistical overview of inequality across Brazil. Finally, a brief economic analysis of the relationship between income inequality, regional inequity and formal employment in order to determine the impacts of Bolsa Família and formal employment on inequality reduction across Brazilian municipalities.

**Why Study Income Inequality?**

Inequality as a descriptive term is used to describe far more elements of quality of life than economic power alone. In *Inequality Matters*, by Prudence Carter and Sean Reardon, the four domains of socioeconomic, health, political, and sociocultural inequality and their relationships are analyzed in the greater discussion surrounding inequality in the United States. An individual’s access to financial capital, for example, can be limited by corrupt political structures within their country. Furthermore, if an individual is limited by certain health constraints, the ways they utilize financial capital will have a different impact on their wellbeing than it would for a healthy individual. This serves to explain that the conversation of inequality is far more complicated than the question of income levels alone. That being said, income inequality can serve as a metric that reflects other issues at play within a given society. It is also a more accessible tool that is easier to quantify than the prevailing attitudes or underlying social norms that shape a community.

The relationship between economic growth and income inequality is often debated. Some level of income inequality is necessary to spur growth within an economy because certain individuals will have more capacity to create jobs and higher returns to investment if there is some level of imbalance in income distribution. However, if taken too far, income inequality can have negative ramifications for economic growth (Berg and Ostry 4). An IMF staff publication
by Andrew Berg and Jonathan Ostry discusses the relationship between sustained periods of economic growth and income inequality as measured by the GINI coefficient of different countries. Economic growth is not constant; there are periods where growth is extremely fast that are sometimes followed by a slow period of decline. In the long-term, a general trend of sustained growth is beneficial to reduce poverty levels in any given country (Berg and Ostry 3). This research concluded that nations with higher income inequality were likely to have more turbulent growth, meaning shorter cycles of growth and decline. These short cycles are an impediment to the sustained growth necessary for long-term poverty reduction (Antoine et al. 5).

Income inequality can lead to changes in prevailing attitudes and social relationships within a country. Extreme income inequality can serve as a social indicator that is linked to higher levels of unhappiness. A study by Shigehiro Oishi, Selin Kesebir and Ed Diener revealed that in the United States, periods of higher levels of income inequality were correlated with higher levels of unhappiness. This research was conducted by comparing GINI coefficients with national survey responses regarding income level and happiness. The impacts of income inequality on unhappiness had the greatest impact on the poorest citizens in the country (Oishi et al. 1098). This is explained because as a general rule, income inequality as measured by a GINI coefficient will increase the most when wealthy individuals in a nation possess a greater share of the wealth compared to the poorest individuals. During a period with a higher GINI coefficient, the bottom quintile of a nation in terms of wealth will have less income, and thus less purchasing power than the top quintile. Most notably, this research determined the role of perceptions of inequality on levels of happiness. To measure perceptions of inequality, survey participants were asked to rank how trustworthy and how fair they perceived other individuals to be. During periods of increased income inequality, Americans perceived other individuals to be less fair and
less trustworthy than compared to periods of relative equality. Moreover, it was determined that for lower income individuals, the reduction in happiness resulting from periods of higher inequality was explained by these changed perceptions as opposed to changes in income (Oishi et al. 1098). The strong association between inequality and perceptions of fairness show how high income inequality can lead to negative attitudes between social classes that disproportionately impacts lower classes. This sort of resentment weakens a community by preventing cohesion and the ability to work together towards a common goal.

_Inequality Matters_ outlines a few key areas where the current academic study of inequality is lacking. Most research on inequality is lumped within research on poverty, implying that the problem of inequality is a “problem of poverty” (Reardon and Carter 13). This leads to research questions that focus on topics such as “Why are people poor?” and “What are the effects of poverty?” _Inequality Matters_ argues for placing a greater emphasis on the structural issues and ramifications of inequality within a society. This results in a new line of questioning: “Why is there so much inequality in socioeconomic conditions, health outcomes, and the distribution of political power?” and “What are the consequences of inequality for society?” Analysis through this framework allows for a better understanding of how inequality will lead to different outcomes and opportunities for different groups. Inequality is complex and intersectional. It is not simply the product of other issues in a country, but a system of cultural norms that builds upon itself. If the wealthiest, dominant group in a country controls the design of educational, health and media systems, those who fall outside of this dominant group will inevitably have more difficulty excelling in these systems and this contributes to persistent inequity.

By studying income inequality we can arrive to a further understanding of structural inefficiencies within a given society. It is important to keep in mind that income inequality
should be interpreted as an indicator of other inefficiencies. Racial, political, and cultural inequalities are all intertwined with income. Next we will explore the recent history of inequality in different regions of Brazil and efforts to reduce poverty.

*Country Context during Lula Election*

The 2002 election of President Lula da Silva marked a radical change for Brazilian politics and an era of representation for the impoverished population long ignored in the political sphere. For most of Brazilian history, a disproportionate amount of political power, and a disproportionate percentage of the country’s wealthy, white population existed in the South and Southeast of the country (Telles 166). Lula’s Workers’ Party, a leftist party dedicated to social progress, openly criticized Brazilian political norms and injustices of the state against its people (“Nossa História”). The figure of Lula alone, a man born in the rural Northeast of Brazil with no college education, symbolized that it was time for a change. This change would entail targeted efforts at improving quality of life for Brazilians, by reducing poverty and inequality and advocating for improved health, education, and human rights for all (“Nossa História”). The party promised to defend the worker, while also promoting the economic growth necessary to lift the country out of poverty. Lula was able to create ethos in his campaign rhetoric by drawing upon his own past as a factory worker. The promises of this campaign had a particularly strong appeal to citizens in the Northeast and North of the country, two regions that had historically higher rates of poverty than the rest of the nation, and two regions that had less influence in shaping Brazilian politics.

In terms of inequality, Lula was presented with not only the issue of income inequality hindering economic growth, but also serious issues of race and gender inequality that had long been pushed aside by politicians. Income inequality in Brazil is not just an economic
phenomenon, it is a product of racial inequality and a systematic oppression of black and indigenous peoples and these issues have ramifications at the national level as well as the local level. High national income inequality reflected the major disparity in wealth in the nation as a whole, with the South and Southeast possessing a disproportionate amount of the nation’s wealth and the North and Northeastern regions becoming associated with poverty. In terms of GDP generation, the North and Northeast respectively generated just 4.5% and 13.1% of the nation’s total GDP in 1998 and both regions had a GDP per capita close to half of GDP per capita in the Southeast region at the time of Lula’s candidacy (Lemos 14). While large cities boomed in southern regions of the country spurring further growth, the North and Northeast were slower to develop and continued to have significantly higher levels of poverty than other regions of the country. The Northeast in particular was slower to industrialize and had a large proportion of informal economic activity (Telles 144). In addition to having higher levels of poverty, the North and Northeast have historically struggled with high income inequality as a byproduct of the slavery systems that shaped the development of these regions.

At the local level, Brazil, a nation whose history is inextricably linked to slavery and the plantation system, struggled to negotiate formal space for black, indigenous, and female Brazilians after the official abolition of slavery in 1888. Due to this failure to construct formal space for all population groups, income inequality was not just a macro-economic issue creating a north-south dichotomy, but an issue that had a large effect on daily life for the majority of Brazilians. Under the slavery system, white men held property and wealth, and this same landed class made political decisions, meaning a lack of power and land for anyone who didn’t fit into this dominant plantation-master ideal. This helped contribute to a pattern of high-income inequality and disparate distribution of resources and wealth within Brazilian towns and cities.
that continued into industrialization. Within these restrictive confines, Brazilians were able to create creative communities that were self-sustaining without formal support or government recognition, however economic measures cannot often quantify these intangible traits. From the 1950’s onward, rapid urbanization in Brazil contributed to the development of an informal economy and informal settlements in cities characterized by a lack of official property rights and employment in the informal sector. These informal settlements, *favelas*, are surrounded by extreme stigma despite the major contributions they provide to Brazilian society (Perlman 8). Historically negative perceptions of marginalized individuals by the state and vice versa contribute to the framework of national development in Brazil.

A study of Brazilian development would be misguided if it overlooked the crucial role of the informal economy. However, a national development plan, such as the one promoted by Lula and the Workers’ Party by nature requires some level of formality and increased interactions between citizens and the state. In order to make his impact, Lula had to work to renegotiate how citizens viewed the government and incentivize participation in the formal sector.

**Precedent for Social Programs**

Prior to the late 20th century, the development of government welfare programs in modern Brazil was largely suppressed by frequent regime changes and the lack of a political process focused on social development. In the absence of government welfare programs, social protection was linked to the formal labor market, privileging the status of primarily white workers and providing little assistance to the rest of the population. The introduction of the democratic government outlined in the 1988 constitution paved the way for a new series of social protection policies. Before this point, the only existing form of welfare was a pension program for rural workers (Soares 3). The 1988 constitution established the national social security
program, *Benefício de Prestação Continuada* (BPC), which provides a benefit payment to elderly Brazilians living below the poverty level as well as Brazilians with deficiencies. The BPC program still provides payments to millions of Brazilians.

In 1991, as poverty started to gain recognition as an issue that the government needed to address, Senator Eduardo Suplicy proposed a bill to provide transfer payments to citizens earning less than minimum wage. This proposal did not pass the senate, but four years later, three different cities would introduce their own versions of conditional cash transfer programs (CCT), starting a new wave of social welfare programs. Brazil introduced its first national CCT program in 1996, which focused on the eradication of child labor, by providing different transfer payments to urban and rural households. This program was followed by a program that provided cash transfers for families meeting school attendance requirements, and another cash transfer that included the same school attendance requirements but added the conditionality that families would have to get children younger than six vaccinated. In the meantime, many Brazilian cities continued to implement their own CCT programs. In 2003, President Lula introduced a fourth national cash transfer program, *Cartão Alimentação*, which provided a transfer payment that could be used exclusively to buy food. These programs were all run by different agencies, meaning it would be possible for a family to receive over four different benefit payments, or none, if they had not applied to receive them. This confusion and administrative difficulty ultimately was overcome with the introduction of *Bolsa Família*, which could be best described as the reorganization and expansion of extant ideas about welfare and poverty reduction (Soares 4). The 6.7 million families registered under other CCT programs were incorporated into *Bolsa Família*, which set a national target to cover 11 million families by 2006 (Soares 6). By introducing *Bolsa Família*, Brazil was able to eliminate redundant benefits and create an
organized means for vulnerable families to access payments they needed.

POLICY REFORM UNDER LULA DA SILVA

Labor Reform

True to the campaign platform, Lula and the Workers’ Party advocated for and created many laws to empower working class Brazilians. Many of the advances experienced by working class Brazilians were negotiated through the work of labor unions, which were supported through the National Labor Forum (Almeida 55). During his two terms as president, Lula consistently raised the minimum wage. From 2003 to 2014 under the Workers’ Party, minimum wage in Brazil increased by 76.2% (Weisbrot et al. 3). This major increase in minimum salary can help to explain why income growth for low-income citizens in Brazil outpaced income growth of high-income citizens during the Lula presidency, helping to shrink the nation’s income gap. However, a minimum wage can only guarantee higher wages for individuals employed in the formal sector, which in some municipalities is as low as one third of working age individuals (Instituto de Pesquisa Econômica Aplicada et al.). The protections extended to workers under Lula went beyond the employed population; from 2003 to 2012, the amount of Brazilians covered by unemployment insurance increased by 99.2% (Summa 12). After a brief period of decline, the increased negotiating power of labor unions helped contribute to increases in real salaries across all sectors after 2006 (Summa 18). Overall, at the end of Lula’s presidency in 2010, the income of Brazilians employed in the formal sector was higher and more secure than when he took office. Furthermore, increases in participation in the formal sector meant that more and more Brazilians could benefit from these economic protections.
**Other Social Programs**

Before discussing *Bolsa Família* and the significance of the program for inequality reduction in Brazil, it is important to recognize that *Bolsa Família*, while perhaps the most recognized program, was not the only policy implemented by Lula aimed to reduce national inequality and it should be studied within the greater context of the Lula presidency. Various other programs contributed to the battle against inequality, even if they did not do so in the form of a cash payment. To empower groups such as women, indigenous peoples, and afro-Brazilians long unrecognized in Brazilian politics, Lula created new cabinet positions, such as the Secretary of Policies for the Promotion of Racial Equality and a Secretary of Policies for Women. The importance of state recognition of property rights was another crucial element of the Lula presidency, including the recognition of informal *Quilombo* communities. However, registering property with the government does not exclusively bring advantages to inhabitants. With formal recognition of ownership comes new taxes, placing a greater burden on low-income citizens.

**Bolsa Família**

*Bolsa Família* was introduced in 2003 with the objective of combating hunger and poverty through a cash transfer payment for the nation’s poorest citizens. This benefit payment was meant to guarantee the basic rights of health, education, social assistance, and food security so that families would be able to exit their situation of vulnerability. The program targets poverty both in the short and long term. In the short term, families can use the transfer payments to alleviate the immediate needs of poverty such as hunger. In the long term, the conditionalities of *Bolsa Família* aim to break the cycle of poverty by ensuring that children receive an education and medical treatment. As poverty rates are much higher in the North and Northeast of the nation, these regions have the highest share of program participants (IPEA).
While the primary objective of *Bolsa Família* was poverty reduction, the program is perhaps Brazil’s greatest national effort to reduce inequality and the program is credited for anywhere from one-fifth to one-third of the reduction in income inequality that occurred from 2001 to 2004 (Soares 20). *Bolsa* aims to reduce income inequality through the premise that education is the factor that separates the wealthiest and poorest citizens in a nation; if poor citizens can receive the same education, the gap between the two classes will shrink. The cash transfers and conditionalities of *Bolsa Família* also promote the reduction of social inequalities by guaranteeing that all children have access to the education and health resources necessary for their personal wellbeing. If children are healthy and well educated, they will be able to contribute to the workforce and society as a whole in order to improve their quality of life.

**Administration of Bolsa Família**

While *Bolsa Família* is a national program, it is administered at the municipal level, meaning that the responsibilities of managing the program are delegated to the local government. In order to receive benefits, individuals must have a government issued ID, which they will then present to their municipal government so they can be registered in the *Cadastro Único* system. *Cadastro Único* is the federal system, which keeps track of all beneficiaries and the payments they should receive. Eligibility for *Bolsa Família* is determined through the Ministry of Social Development based on the income level registered in the *Cadastro Único* system. Families who are considered to live in extreme poverty or poverty are eligible for the program. One unique element of *Bolsa Família* is that eligibility is determined at the household level as opposed to the individual level, meaning the average income of all individuals in a home is used as opposed to just the income of one parent.
The following income requirements are used to determine program eligibility:

- **Extreme Poverty**: Monthly income per family member between R$0 and R$85 ($27.50)
- **Poverty**: Monthly income per family member between R$85.01 ($27.51) and R$170 ($54.90)

The amount of benefit a family receives depends on the family’s income level as well as family characteristics. Families classified in situations of extreme poverty are the primary targets for the program and thus eligible for the largest amount of benefits. Families with children and expecting mothers are able to receive additional benefits.

Program benefits are broken down into the following three categories:

- **Basic Benefit**: R$85 ($27.50) monthly exclusively for families classified in extreme poverty

- **Variable Benefit**: Up to five separate payments of R$39 ($12.50) monthly for each family member in the following subcategories
  - Children between 0 and fifteen years old
  - Pregnant women
  - Infants between 0 and six months old

- **Adolescent Variable Benefit**: Up to two payments of R$46 ($14.70) monthly for each family member between the ages of sixteen and seventeen ("Bolsa Família")

Based on the limitations of the number of benefits receivable, the maximum amount a family can receive from the Basic, Variable and Adolescent Variable payments is limited to R$372.00 ($119) per month. An additional payment is available to families in situations of extreme poverty entitled Benefit to Overcome Extreme Poverty. Eligibility for his benefit is determined based on family income after Bolsa Família transfer payments are included.

*Bolsa Família* is a conditional cash transfer model, which means that participants must adhere to program regulations in order to continue receiving payments. This creates a dual-system of accountability in which participants must abide by program requirements and the local
government must provide all necessary services for participants. The program requirements encourage the following positive health and educational practices.

**Health Conditionalities:**
- Maintain vaccinations for children between zero and seven years of age
- Attend pre-natal consultations (pregnant women)
- Participate in educational programs about breast-feeding and healthy eating (women who breast-feed)

**Education Conditionalities**
- School attendance rates of at least 85% for children between six and fifteen years old
- School attendance rates of at least 75% for adolescents between sixteen and seventeen years old ("Bolsa Família")

While the value of the benefit payments has steadily increased over time to reflect changes in cost of living, the program has undergone relatively few changes since its inception. The program has consistently increased in enrollment since its inception.

**LITERATURE REVIEW**

*Bolsa Família*

The impact of *Bolsa Família* and the structure of the program have been extensively analyzed in academic literature. In general, the program is considered to be a success in terms of clear improvements to school and health participation of program participants for a relatively small investment on behalf of the government (under 1% of the nation’s GDP) (Soares 6). However, the objectives of the program raise some important questions. According to Sergei Soares of the Brazilian Institute for Applied Economic Research, *Bolsa Família* rides the line between a social protection program and an opportunity-generating program, which means that the program does not truly accomplish either goal (Soares 9). Conditionalities imply that the cash transfer is not a guarantee of income protection for all low income Brazilians, meaning that
it does not offer total social protection. Moreover, while school attendance and basic health are crucial for poverty reduction, the conditionalities set by Bolsa Família are not particularly difficult for families to achieve and they do little to increase capacity of program participants. In order for Bolsa Família to generate opportunities for participants, Soares argues it would need to provide either some sort of career training or incentivize higher education. Furthermore, the transfer payments provided by Bolsa Família are relatively small. Using a poverty line of R$120, Bolsa Família only caused an 8% reduction in the percentage of the population living in poverty. However, the program did cause an 18% reduction in the nation’s poverty gap because the transfer payment was enough to increase the income of some families to over the poverty line (Sátyro and Soares 27).

Partially attributed to Bolsa Família, Brazil witnessed major improvements to school enrollment rates from 2000 to 2010. From 2005 to 2010, the percentage of six year olds enrolled in primary school increased from 83% to 92% (Chavez 7). School attendance amongst program participants has also increased by about 3.6% since the program’s inception (Chavez 7). The conformity of program participants to school attendance conditionalities is more effectively monitored than abidance to health conditionalities, and by 2010, the federal government was able to monitor the school attendance of over 85% of program participants (Soares 10). One major criticism of Bolsa Família outlined by Chavez regarding the program’s education conditionality is the fact that increasing school attendance does not necessarily increase the quality of education that students receive. The program does not provide extra funding to schools in low-income areas with high program participation and student achievement can be restricted in this way. If education is in fact the key to inequality reduction, as Bolsa Família organizers claim, it seems
that greater investment in reducing educational inequity should be the next logical step in Brazil’s social policy development.

One fear often associated with social welfare programs is the concern that individuals will forgo working and searching for employment and choose to sustain themselves from government payments. This topic is particularly interesting in the realm of *Bolsa Família*, through which the maximum possible monthly payment receivable is only about one third of monthly minimum wage, meaning that *Bolsa Família* participation alone is not enough to allow a family to live comfortably. In order to receive transfer payments from the program, a family must actively register with their municipality and present appropriate government issued identification. To receive a greater transfer payment these individuals would then have to lie about their income levels, concealing income generated from the informal sector. Because *Bolsa Família* does not provide enough income to stop working altogether, participation in the program could incentivize participation in the informal sector as opposed to the formal sector. However, to date, research does not indicate that *Bolsa Família* participation has a major impact on labor force participation, refuting the claims of critics of the program (Soares 25).

There is increasing literature measuring the positive social effects of *Bolsa Família* beyond the program’s conditionalities, including positive impacts on female empowerment and eliminating aspects of social isolation associated with poverty. For women who receive *Bolsa Família* on behalf of their families, the process of registering with the municipal government by presenting government issued IDs can signify a greater level of civic engagement. This increased civic engagement provides greater autonomy to women, and female participants in *Bolsa Família* feel more independent and able to care for their families (Paes-Sousa and Rômulo 149). The positive social impacts extend to the community as well and recent research aims to quantify

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the positive spillovers of the program. Research conducted in São Paulo has determined that Bolsa Família participation has positive impacts on crime reduction, particularly with crimes related to income such as theft and robberies (Chioda et al. 1).

**Inequality Reduction**

Perhaps because the program is unique to Brazil, the role of Bolsa Família in income inequality reduction has received a significant amount of attention in the international community. While Bolsa Família may represent a key part of inequality reduction in Brazil, economic changes had a far greater influence on this process simply because income inequality is a reflection of the distribution of wealth in a country. An extensive report on income inequality reduction by the Brazilian IPEA in 2007 studies the change in income inequality in the nation from 1998 to 2005 and this report is able to observe the changes that occur as a result of the implementation of Bolsa Família in 2003. According to this report, 66% of the reduction in the nation’s GINI score during this time period is attributed to changes in total income from work (Barros et al. 39). The calculations done by the IPEA attribute 23.7% of the GINI reduction in this time period to increases in government transfer payments including Bolsa Família. Unfortunately, due to limited data this report was not able to determine the effects of transfer payments in the Northern region of the country. The report did determine that during the first years of Bolsa Família, the program had a significantly higher impact on income inequality reduction in the Northeast of the country. Particularly, from 2002 to 2004, transfer payments (including Bolsa Família) were accredited with 87% of the reduction in per capita GINI coefficients in the Northeast (Barros et al. 39). Per this study, other regions did not even attribute one-third of per capita income inequality reduction to transfer payments, which shows the high importance of Bolsa Família participation in the Northeast (Barros et al. 38).
From 2001 to 2005, the Brazilian marketplace progressed towards more equal pay for men and women as well and black and white employees. In 2001, men received an average salary 58.1% greater than females with the same qualifications, but this gap reduced by two percentage points by 2005. The disparity between salaries of male and female workers is greater than the disparity between black and white workers in Brazil, but race unfortunately plays a part in determining an individual’s expected salary. From 2001 to 2005 the percent difference of earnings received by white workers compared to black workers decreased by roughly two percentage points from 12.9% to 11% (Barros et al. 379). These changes in salary based on race and gender helped contribute to greater equality and more equal opportunities for employees in the Brazilian labor force during this time, but only corresponded to 9% total of the decrease in income inequality derived from income from working (Barros et al. 391).

In addition to more egalitarian pay across different races and gender, a diverse range of factors were responsible for increases in equality in income derived from work. These factors include increased geographic equality (minimizing payment differences between urban and rural municipalities) as more equal pay across sectors. Of all the factors mentioned thus far, geographic equality had the biggest impact on inequality reduction, contributing to 22% of the reduction in inequality in income derived from work. Despite advances in other aspects, one area where Brazil struggled to make improvements was the differential between salaries of those employed in the formal and informal sectors. Under the Lula administration, the proportion of workers participating in the informal sector declined, indicating progress towards higher economic development. However, since 1996, and including the first years of the Lula administration up to 2005, the differential in salary between workers employed formally and informally continued to rise. From 2001 to 2005, the percentage of salary formal sector workers
earn over informal sector workers increased from 36.4% to 40.6% (Barros et al. 384). Due to the growing disparity between the informal and formal sectors from 2001 to 2005, changes in formal employment in this time period were actually associated with an increase in income inequality.

Finally, increasing minimum salary is a tool that when used effectively is proven to have the ability to reduce income inequality within a country. In Brazil, workers in the formal sector earning minimum wage benefitted from the salary increases implemented by the Lula administration. However, from 2001 to 2005 while minimum salary increased, so did the number of Brazilians receiving less than minimum salary (Barros et al. 485). In Brazil, the third decile of the population in terms of income is the group that receives a salary equal to or close to minimum wage, and approximately 20% of citizens earn less than minimum wage. From 2001 to 2005, the income of Brazilians in the bottom quintile of the population decreased relative to minimum wages, meaning the most vulnerable citizens did not benefit from this policy change. This is particularly apparent in the Northeastern region of the country, where approximately 40% of the workforce receives a salary below minimum wage (Afonso et al. 572).

DATA ANALYSIS

As outlined in the literature review sections of this paper, the factors that contributed changes in income inequality in Brazil during the Lula administration (Bolsa Família, minimum wage increases, and formal economic growth) have different levels of effectiveness in different areas. For example, in a large city such as São Paulo or Rio de Janeiro, an increase in minimum wage will have less impact on income inequality because this increase is smaller relative to the large amount of wealth possessed by the top quintile of the population. Thus, by exclusively
looking at Brazil’s national GINI score, it is easy to overlook regional trends in inequality reduction.

The Lula administration created many policies designed to empower workers and eliminate national poverty, however, these programs by their nature as state run programs favor participation in the formal sector. The government is unable to provide formal protections to workers operating without an official work license or a government issued ID card and data shows that Brazil is becoming a less profitable nation for those working in the informal sector. Even Bolsa Família, a program that provides a transfer payment to low-income Brazilians regardless of if they are employed in the formal or informal sector, favors adherence to a certain government norm; Bolsa Família beneficiaries must have an ID card and register in person with their municipal government before they can even be considered to receive payments.

Municipalities across Brazil are extremely different in terms of their size, geography, and socio-economic composition and this same variation extends to municipal governments. By placing program administration in the hands of local governments with varying levels of organization and sophistication, the efficiency of Bolsa Familia distribution is subject to variation as well.

This thesis hypothesizes that inequality reduction in Brazil during the Lula administration would favor municipalities that were more effectively able to organize participation and engagement with the formal sector. This implies that municipalities with higher formal employment participation rates would be the same municipalities that were the most effective at administrating Bolsa Familia and other government programs, thus causing greater reductions in income inequality.

To test this theory, data were sourced from the Brazilian Applied Economics Research Institute, Fundação João Pinheiro, and United Nations Development Program’s 2013 study of
municipal development in Brazil, *The Atlas of Human Development*, which covers a wide range of standard of living indicators from education levels to population across Brazilian municipalities (Instituto de Pesquisa Econômica Aplicada et al.). The data in this report were based on the results of the 1991, 2000, and 2010 censuses, which were administered by the Brazilian Institute of Geography and Statistics. For purposes of this research, the results of the 2000 and 2010 census were compared to show changes during Lula’s presidency, which lasted from 2003 to 2010. Additional data on *Bolsa Família* participation were also accessed from the Brazilian Applied Economics Research Institute (Instituto de Pesquisa Econômica Aplicada). Data on *Bolsa Família* are taken annually, based on the number or beneficiaries and total payments in every December starting in the year 2004. Census data are taken at the individual level while all data on *Bolsa Família* are taken at the household level. Only the 5,565 municipalities with consistent data for both the 2000 and 2010 census were studied in this research.

**Empirical Overview of Inequality Reduction**

In order to understand this line of research, it is important to address a gap in the scholarly literature on income inequality reduction by providing an empirical overview of the high variation municipalities across Brazil witnessed in inequality reduction. As aforementioned, from 2000 to 2010, 1,133 municipalities (approximately 20% of the total number) in Brazil saw no improvements to income inequality, signifying the GINI coefficients of these municipalities either remained the same or increased during this period. On average, municipalities in the North and Northeast were less effective at reducing income inequality than the rest of the country. From 2000 to 2010, income inequality increased or remained the same in 159 of 449 (35.4%) of municipalities in the North, 492 of 1794 (27.4%) municipalities in the Northeast, 227 of 1,668
(13.6%) municipalities in the Southeast, 171 of 1,188 municipalities in the South (14.4%) and 84 of 466 (18%) municipalities in the Central-West. The following table (Table 1) shows the average municipal GINI coefficient for Brazil’s five regions and the nation as a whole.

### Table 1

<table>
<thead>
<tr>
<th>Region</th>
<th>2000 Municipal GINI Average</th>
<th>2010 Municipal GINI Average</th>
<th>Change in Municipal GINI Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>0.5471</td>
<td>0.4944</td>
<td>-0.05268</td>
</tr>
<tr>
<td>North</td>
<td>0.5992</td>
<td>0.5677</td>
<td>-0.03154</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.5619</td>
<td>0.5251</td>
<td>-0.03681</td>
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<tr>
<td>Southeast</td>
<td>0.5295</td>
<td>0.4659</td>
<td>-0.06362</td>
</tr>
<tr>
<td>South</td>
<td>0.5237</td>
<td>0.4599</td>
<td>-0.06386</td>
</tr>
<tr>
<td>Central-West</td>
<td>0.5617</td>
<td>0.4953</td>
<td>-0.06648</td>
</tr>
</tbody>
</table>

On average, municipalities in Brazil reduced their GINI coefficients by slightly over 0.05 from 2000 to 2010. The data revealed that the North and Northeastern regions of the country had the highest income inequality at the time of the 2000 census. Despite high rates of participation in government programs such as *Bolsa Família*, these regions were also less effective at reducing income inequality than the rest of the nation. Not only was percent reduction in municipal GINI smaller in the North and Northeast, but total reduction in income inequality was smaller in these regions as well. This chart shows that municipalities in the southern region of the country had the lowest average income inequality across both time periods. The Central-Western region of the country was the winner in terms of inequality reduction, witnessing the greatest decrease in average income inequality. As shown in Table 2 below, there was high variation within regions
in terms of income inequality reduction, and the Central-West and North had the largest standard deviations for this metric.

Table 2

<table>
<thead>
<tr>
<th>Region</th>
<th>Standard Deviation of GINI Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>0.0759</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.0617</td>
</tr>
<tr>
<td>Southeast</td>
<td>0.0597</td>
</tr>
<tr>
<td>South</td>
<td>0.0664</td>
</tr>
<tr>
<td>Central-West</td>
<td>0.0794</td>
</tr>
</tbody>
</table>

In order to visualize income inequality reduction at the state level, the following map (Figure 3) represents the average municipal GINI coefficient reduction of Brazil’s 26 states and federal district, Brasilia. These scores were then broken down into five quintiles, in which the 5th quintile saw the greatest reduction in income inequality from 2000 to 2010 and the 1st quintile saw the least reduction in income inequality.
It is worth noting that on average, municipalities in the states of Acre, Amapá, Roraima actually saw a slight increase in income inequality during this time period and that income inequality in Brasilia remained constant. The three states where income inequality increased are all located in the North of the country. In the rest of the nation, average municipal income inequality decreased at varying levels. Santa Catarina and Paraná, two states in the South of Brazil saw the greatest average decrease in income inequality; with reductions of over .07 to their respective GINI coefficients.

The averages conducted in this analysis were based on average municipal scores, without weighting results for population size of the respective municipalities. Municipalities in extremely large cities tended to have significantly less improvement in income inequality than the national
average. Thusly, adjusting state-level GINI averages for municipal population size has a greater impact on states such as Rio de Janeiro and São Paulo which both possess mega-cities that saw increases in income inequality. As Brazil is a highly urbanized nation that continues to urbanize, it is important to address the issue of urban inequality and analyze federal policies for their effectiveness in urban areas. For reference, the 2000 and 2010 GINI coefficients of the largest cities in each Brazilian State are included in the attached appendix.

**Correlation Analysis**

The preliminary empirical analysis revealed that the North and Northeastern regions were much less successful at reducing income inequality than other regions in the nation. As these regions also had higher income inequality in 2000, this led to the concern that municipalities with high income inequality in 2000 were actually less likely to reduce their income inequality in 2010. To test this concern the correlation between the 2000 GINI scores and change in GINI scores was calculated.

\[
\text{Correlation}(2000 \text{ GINI coefficient}, \Delta \text{ GINI coefficient from 2000 to 2010}) = -0.5227
\]

The strong negative relationship between these values indicates that municipalities with higher 2000 GINI coefficients saw a greater decrease in their respective GINI scores from 2000 to 2010. Generally, this means that income inequality reduction was the strongest in the municipalities of Brazil that needed it the most. However, municipalities with above average income inequality in the North and Northeast were less effective at reducing income inequality than their counterparts in other regions of the country.
To test the hypothesis that successful inequality reduction was connected to formalization, the relationship between income inequality and formal employment was calculated.

\[
\text{Correlation}(2000 \text{ GINI coefficient, } \Delta \% \text{ Formal Employment from 2000 to 2010}) = -.0882
\]

\[
\text{Correlation}(\Delta \text{ GINI coefficient from 2000 to 2010, } \Delta \% \text{ Formal Employment from 2000 to 2010}) = -.0815
\]

These values show that formal employment is associated with a slightly greater capacity to reduce income inequality. Municipalities with high-income inequality in 2000 were less able to increase the percent of the labor force employed in the formal sector. Additionally, the negative relationship between the change in a municipality’s GINI coefficient and the change in its percent of workers employed in the formal sector shows that a greater decrease in income inequality corresponded to a greater increase in formal sector employment.

To test the relationship between Bolsa Família administrative effectiveness and inequality reduction, this research posited that municipalities that were less effective at implementing the program would be slower to arrive to their target number of recipients due to poor advertising of the program and weak implementation mechanisms. Within the confines of the available data, the annual change in total program participation is used to indicate how effectively Bolsa Família was introduced in different municipalities. A municipality that was less effective at registering program participants would see a greater increase in families registered in the program after the first year of the program. To test this, municipal level participation in the first years of the Bolsa Família program was contrasted with the municipal level data on income inequality in Table 3.
Supporting the hypothesis, results of these tests show that a higher initial GINI coefficient corresponded with a greater increase in program participation in the first years of the *Bolsa Família* program. Furthermore, this research also shows that municipalities that were slower to reach their target number of program participants tended to have a higher GINI score in 2010, meaning that municipalities that were less successful in implementing the program had less improvement to income inequality. While further tests are necessary to prove causation, the results of this preliminary research shows that poor municipal organization could be an impediment to inequality reduction, meaning that inequality reduction favors municipalities with stronger infrastructures.

Finally, economic change and increasing power to workers were responsible for a large amount of the progress made towards income equality in Brazil during Lula’s administration. As Brazil is transitioning to a primarily service based economy, the role of this transition in income inequality should be studied. To test this relationship, the correlation between changes in participation in the service sector was contrasted to changes in municipal level income

---

**Table 3**

| Relationship Between Municipal Bolsa Familia Participation and Income Inequality |
| --- | --- |
| Correlation(2000 GINI Coefficient, Δ Number of Families Registered in Bolsa Familia from 2004 to 2005) = 0.1211 | Correlation(2010 GINI Coefficient, Δ Number of Families Registered in Bolsa Familia from 2004 to 2005) = 0.1853 |
| Correlation(2000 GINI Coefficient, Δ Number of Families Registered in Bolsa Familia from 2004 to 2006) = 0.1316 | Correlation(2010 GINI Coefficient, Δ Number of Families Registered in Bolsa Familia from 2004 to 2006) = 0.2070 |
| Correlation(2000 GINI Coefficient, Δ Number of Families Registered in Bolsa Familia from 2004 to 2007) = 0.1322 | Correlation(2010 GINI Coefficient, Δ Number of Families Registered in Bolsa Familia from 2004 to 2007) = 0.2089 |
inequality. The metric used was the percent of employees per municipality employed in the service sector.

\[
\text{Correlation}(\Delta \text{GINI 2000 to 2010}, \Delta \% \text{employed in service sector 2000 to 2010}) = 0.1118
\]

A greater increase in service sector employment corresponded to a greater increase in income inequality. This could be because a higher service sector employment share, which is a feature of growing urban regions, means incomes will rise for some workers, but the benefits of growing urbanization do not spread to the poorer population.

**Regression Analysis**

To understand the major determinants in inequality reduction across Brazil, and the role of the formal sector and economic growth in this process, I formulated a linear regression model using R software with observations from 5,503 municipalities with recorded data from the *Atlas of Human Development* and municipal level GDP data from the IBGE (IBGE). Data regarding *Bolsa Familia* were excluded from the model due to a lack of recorded data for a substantial number of municipalities. The formula for this model estimates the predicted change in GINI score (2010 GINI - 2000 GINI) based on municipal characteristics. As a fall in income inequality is shown by a lower 2010 than 2000 GINI score, in this model, negative coefficients correspond to a greater reduction in income inequality. The following specification was used:

\[
\text{Change in GINI} = \text{origgini} + \text{origform} + \text{changeform} + \text{changeservice} + \text{isnorth} + \text{isnortheast} + \text{issouth} + \text{issoutheast} + \text{rawgdpchange}
\]

The variable *origgini* corresponds to the municipality’s 2000 GINI score, *origform* corresponds to the municipality’s level of formal employment, measured as the percent of the workforce employed in the formal sector. *Changeform* is the change in the percent of workers in the formal
sector, and changeservice is the change in the percent of workers employed in the service sector from 2000 to 2010. Rawgdpchange is the change in municipal average GDP per capita from 2000 to 2010. Finally, isnorth, isnortheast, issouth, and issoutheast are dummy variables for the different regions of Brazil. Thus, a municipality that receives a score of 0 for all four of these regional criteria would be a municipality in the last remaining region of the country, the Central-West. The regression model yielded the following results:

Table 4

| Coefficients:         | Estimate | Std. Error | T value | Pr(>|t|)   |
|-----------------------|----------|------------|---------|-----------|
| (Intercept)           | .3202    | 7.120e-03  | 44.979  | < 2e-16 ***|
| originalgini          | -.6443   | 1.053e-02  | -61.198 | < 2e-16 ***|
| originalformalemp     | -.0004617| 5.536e-05  | -8.340  | < 2e-16 ***|
| changeformal          | -.0008676| 8.296e-05  | -10.459 | < 2e-16 ***|
| changeservice         | .0007963 | 1.313e-04  | 6.063   | 1.42e-09 ***|
| isnorth               | .04722   | 3.439e-03  | 13.728  | < 2e-16 ***|
| isnortheast           | .01757   | 2.818e-03  | 6.235   | 4.85e-10 ***|
| issouth               | -.01989  | 2.837e-03  | -7.011  | 2.65e-12 ***|
| issoutheast           | -.01558  | 2.710e-03  | -5.747  | 9.60e-09 ***|
| rawgdpchange          | .0000001803 | 6.758e-08  | 2.668   | 0.00766 ** |

Significance levels: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05

Residual standard error: 0.04951 on 5493 degrees of freedom
Multiple R-squared: 0.4385, Adjusted R-squared: 0.4376
F-statistic: 476.7 on 9 and 5493 DF, p-value: < 2.2e-16
All coefficients were statistically significant, indicating that the effect of each of these estimates differed from 0. Municipalities with high levels of formal employment in 2000 were shown to have a larger decrease in income inequality. Furthermore, an increase in formal employment participation was associated with a greater decrease in income inequality. This is likely due to the increases in protections and wages for formal sector employees introduced during Lula’s presidency, such as higher minimum wages. Municipalities more equipped to engage with the formal sector would be able to reap more of the rewards of these programs.

As shown in the Correlation Analysis section of this paper, a higher initial GINI score corresponds with a greater decrease in income inequality; meaning municipalities with high income inequality in 2000 saw the most improvements during this time period. While income inequality reduction varied greatly during this period, as a general rule, the municipalities that had the greatest need to improve saw the most improvement, indicating a successful trend in inequality reduction for the nation as a whole.

Increased service sector participation and increased GDP per capita, two factors associated with economic development, were shown to be impediments to income inequality reduction in Brazil. This implies that if GDP increases are not distributed to lower income members of a society, there will be little improvement to income inequality as a result of this economic development. Moreover, as Brazil transitions to a service based economy, the relationship between service sector participation and income inequality must be monitored.

Finally, the regional variables in this regression model reveal differing levels of success in inequality reduction across the five different regions of Brazil. Despite having access to the same government programs and a general trend of economic growth, municipalities in the North are estimated to have .04722 less GINI reduction than those in the control group (Central-West)
and municipalities in the Northeast saw .01757 less reduction. The regression model revealed encouraging results for municipalities in the South and Southeast, which are estimated to have .01989 and .01558 greater income inequality reduction, respectively, than the control group. Thusly, the regions of Brazil with the greatest levels of wealth and a lower regional average GINI score in 2000 saw the greatest improvements to income inequality. This means that a municipality with a high 2000 GINI score would be predicted to have a greater decrease in income inequality if it were in the South or Southeast than if it were in the North or Northeast. The results of this model show that while as a general rule income inequality decreased, the variation between regions in inequality reduction may affirm the need for greater policy interventions in the North and Northeast.

CONCLUSIONS AND RECOMMENDATIONS

The pronounced income inequality and poverty reduction Brazil accomplished under the Lula administration merits careful study. However, the findings of this research confirm that nationally instituted programs such as minimum wage laws and government transfer payments may be met with different levels of success at the regional level. Furthermore, despite all the innovative programs introduced during this time, approximately one-fifth of Brazilian municipalities did not reduce income inequality. Among the myriad of reasons income inequality should have reduced under the Lula administration, it is almost more noteworthy that so many municipalities failed to make improvements in this regard. The overall pattern of inequality reduction in Brazil is uplifting for the nation’s development future, but the fact that regions with higher historic inequality (North and Northeast) were less successful in inequality reduction raises some concern. Income inequality is an impediment to sustained economic growth and it can engender negative attitudes within a community. If these issues continue to have a stronger
effect in the North and Northeast of the nation, the hope of a more egalitarian economy throughout Brazil as a whole may be elusive.

Despite the best efforts of any effective policy, it is impossible to create a program that is equally effective for all citizens of a country. A family with more than five children, a family without government issued ID cards, and families that live far away from their municipal seat of government are already at a disadvantage in terms of the value they can receive from participation in a program like *Bolsa Família*. Moreover, an individual is subject to the effectiveness of their municipal government, school, and health systems when they to participate in *Bolsa Família* conditionalities. Furthermore, if additional research supports the results of this regression analysis that variables associated with economic development, GDP per capita and service sector employment, correspond to increased income inequality, then the path of economic development in Brazil needs to be evaluated with a more critical lens.

This research can help pave the way and provide an empirical reference for future research on inequality reduction in Brazil. The relationship between formal sector employment and municipal level organization could be further assessed through descriptive data about the different characteristics of municipal level governments and data representing government benefit programs should be included as well. This deeper level of analysis could help explain how neighboring municipalities in the same state can witness such different results in their GINI score reduction.

From 2000 to 2010, the pattern of inequality reduction in Brazil shows that municipalities that were able to operate within the boundaries of federal norms were most adept at reducing income inequality. Incentivizing formal employment so more workers will have formal protections and safe environments is a key step in this process; however, in Brazil these
incentives have occurred at the detriment of those employed in the informal sector. Ultimately, the federal government should pay particular attention to the limiting factors for income inequality reduction across municipalities. If historic, culturally specific factors contribute to inequality differently in different regions, a national plan to reduce inequality should allow the flexibility to tackle these issues head on. When Brazil is able to accomplish this and provide municipalities with the support they need to address their unique challenges, Brazil will achieve a development model in which all regions are afforded the opportunity to flourish.


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## APPENDIX

<table>
<thead>
<tr>
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