Intra-Household Consumption Inequality: Empirical Evidence from Brazil

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Abstract

This paper investigates the intra-household consumption allocation in order to analyze the economic inequality among individuals of Brazil. We estimate a collective model and identify the resource shares for each family members. Our empirical results reveal that men absorb a higher fraction of family resources than women in all family sizes analyzed. We also find that the share of total resources devoted to children increases with the number of children, but the average per child share decreases. In general, our results did not reject the collective model in all estimations. By contrast, we do reject the standard unitary model. Finally, our results are informatively crucial for the design of redistributive policy or social programs, because they provide a broader and more accurate view of the well-being of individuals. More precisely, they could inform policy makers about how to target individuals effectively within households in order to minimize the incidence of inequality as well as provide useful information for Conditional Cash Transfer programs (such as *Bolsa-familia*) on how to address the transfers more efficiently.

Key words: collective model; resource share; inequality.

Resumo

Este artigo investiga a alocação do consumo intrafamiliar para analisar a desigualdade econômica entre indivíduos do Brasil. Estima-se um modelo coletivo e identificaram-se as chamadas parcelas de recursos de cada membro da família. Os resultados empíricos revelaram que os homens absorvem uma maior fração dos recursos familiares do que as mulheres em todos os tamanhos das famílias analisadas. Verificou-se também que a proporção dos recursos totais dedicados às crianças aumenta com o número de crianças, mas a proporção média por criança decresce. Em geral, os resultados obtidos não rejeitaram o modelo coletivo de comportamento dos domicílios em todas as estimativas. Em contrapartida, nós rejeitamos o modelo unitário padrão. Finalmente, esses resultados são informativamente cruciais para o desenho de políticas redistributivas ou programas sociais porque proporcionam uma visão mais ampla e mais precisa do bem-estar dos indivíduos. Mais precisamente, nossos resultados podem informar os formuladores de políticas sobre como beneficiar aos indivíduos efetivamente dentro dos domicílios, a fim de minimizar a incidência da desigualdade, bem como fornecer informações úteis para os programas de Transferência Condicionada de Renda (como Bolsa-Família) sobre como desenhar as transferências de forma mais eficiente.

Palavras chaves: modelo coletivo; parcela de recursos; desigualdade.

Classificação JEL: D12, D13, I31, O12.

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1. Introduction

One of the main concerns for a long time in economics has been the proper measure of inequality in order to understand, to some degree, the welfare of individuals. Brazil is well known for being one of the most unequal countries in the world, and although social disparities have been reduced in recent years, inequality is still high and lingering. In particular, the Gini coefficient decreased by 11% and settled at 0.515 between 2003 and 2014, and in this same period 29 million people got out of poverty (WORLD BANK, 2016)[3]. This decline in inequality has been induced mainly by redistributive public policies translated in conditional cash transfers program such as *Bolsa Família* (LUSTIG et al., 2013), the increased supply of public services, access to education, formal employment and economic growth (DE SOUZA, 2012; ARNOLD; JALLES, 2014).

A vast literature has studied inequality phenomenon for the Brazilian context over time (see e.g. LEFF, 1972; LOVELL, 2000; AZZONI; SERVO, 2002; DE MENEZES et al., 2012; ARNOLD; JALLES, 2014; among others). Nevertheless, literature on inequality often ignores the intra-household distribution of resources providing misleading analytical bases to explore the degree of inequality at the individual level. This has been presented because the empirical evidence has used measures of well-being based on the consumption inequality at household level, which is the basis of the traditional unitary model of consumer behavior[4]. This has occurred because typical micro-data on consumption usually provide information at the household level instead of at individual level. These informational restrictions lead to the impossibility of obtaining direct measures of inequality based on individual consumption. In order to address this drawback, the collective models of household consumption behavior have gained increasingly popularity in the economic literature during recent years[5]. An intrinsic feature of the collective model is the so-called resource shares[6], which are useful measures of individual consumption expenditure and it can be interpreted as the individual bargaining power within the household. Dunbar et al. (2013) point out that if resource shares are unequal then there will be intra-household inequality. Hence, the knowledge of the share of resources for each individual within households may provide useful information about the well-being of people.

Brazil is not an exception to this issue and the analysis of how the intra-household resource allocation process is given has not received much attention and remains a puzzle. To fill this gap, in the present paper, we build a framework grounded in the collective household model developed in Dunbar et al. (2013) for identifying individuals' resource shares, especially for children, using Brazilian data. This is of particular interest in the sense that the individual allocations of resources within households are not usually observed and retrieving the sharing process is based on strong assumptions, especially when children are considered in the structural model[7]. More generally, literature on collective models of household behavior considers children as either consumption goods of parents, attributes of the household or they are not taken into account at all[8]. Nevertheless,

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[3] The income level of the poorest 40% of the population rose, on average, 7.1% in real terms between 2003 and 2014. Meanwhile, income growth for the population as a whole was of 4.4 (WORLD BANK, 2016).

[4]This approach assumes that the household is a single decision-making unit. That is, all household members have the same utility function which is maximized subject to a household budget constraint (VERMEULEN, 2002; CHERCHYE et al., 2007).

[5] In contrast with the unitary model, this approach considers the household as a set of individuals, which have their own preferences, and an intra-household bargaining process to make decisions. (CHIAPPORI, 1988, 1992; CHERCHYE et al., 2012; BROWNING et al., 2013; DUNBAR et al., 2013; BARGAIN et al., 2014).

[6] Resource shares are defined as each member's share of total household consumption expenditures. Collective household models posit that each household member has access to a fraction of the household budget (a resource share), which defines the shadow budget faced by a household member and that jointly with the within-household shadow price vector determines the material well-being of the household member (MENON et al., 2012).

[7] See, e.g., Browning (1992); Liu and Hsu (2004); Dunbar et al. (2013) and Bargain et al. (2014) for examples of literature on the cost of children.

[8] See, e.g., Browning et al. (2013), Lewbel and Pendakur (2008) and Bargain and Donni (2012) for a literature that does not take account of children.

there is consistent evidence that children have separate utility function in households (CHERCHYE et al., 2009). Therefore, an understanding of these relations is critical for informing policy makers about how to target individuals effectively within households in order to minimize the incidence of childhood inequality. This will be possible if public policies are addressed to some type of individuals or group of individuals within households such that they can have an impact.

Our work is related to a growing empirical literature of collective models of household behavior, which can be dated back to Becker (1965,1981). Among the more representative studies that identify resource shares using information only on expenditures at the household level, we can mention those of Chiappori (1988, 1992); Lewbel and Pendakur (2008); Lise and Seitz (2011); Bargain and Donni (2012); Cherchye et al. (2012); Browning et al. (2013) and Dunbar et al. (2013). In particular, Lise and Seitz (2011) use UK data from 1968 to 2001 to analyze how changes in the source of household income can be translated into changes in individual consumption allowances. They show that ignoring consumption inequality within households yield misleading estimates of the distribution of resources in a particular society as a whole. Analyzing the case of Philippines, Haddad and Kanbur (1989) show that ignoring within household inequality may have serious downward bias in about 30% in the level of inequality among individuals. Chiappori and Meghir (2015), meanwhile, also argue that research about poverty and inequality that ignores resources allocation within households is both incomplete and misleading. So, taking into account that the ultimate object of concern of redistributive policies is the improvement of the individuals' living standards, the degree of intra-household inequality as well as its determinants should be evaluated.

Our study makes some noteworthy contributions to the literature, particularly for Brazil. First, we build a framework grounded in the collective household model developed in Dunbar et al. (2013) for identifying individuals' resource shares, especially for children using Brazilian data. Second, the present study allow identifying gender discrimination in the allocation of resources among children for families of different sizes and composition in order to show how it contributes to total inequality. In addition, an analysis across regions also is presented. In this point, recent studies including Zimmermann (2012), Dunbar et al. (2013), Azimi (2015) and Hori et al. (2015) have reported systematic evidence of children gender bias in intra-household allocations. Azimi (2015), for example, using Iranian data found evidence of gender bias against girls in intra-household resource allocation in rural areas. More specifically, he found that rural parents assign between 1.6 and 1.9 percentage points more resources toward their sons relatively to their daughters.

Although there are some studies as Braido et al. (2012) and Iglesias (2016) providing no evidence of gender bias in intra-household resource allocation for Brazil, there has been little systematic research evaluating intra-household inequality across regions. Braido et al. (2012), using a data set collected in 2002 of a conditional cash transfer program (*Bolsa-escola*), found no evidence that household consumption decisions change with the fact that a woman is receiving the transfer which suggests there is not this type of discrimination. On the other hand, Iglesias (2016) uses micro-data of the Consumer Expenditure Survey (POF 2008-2009) and examine how much of the family resources are dedicated to each member in order to assess individual poverty. He found no conclusive evidence in relation to systematic consumption biases against boys or girls. Once this question remains open, we attempt to contribute to the debate delving deeper about the existence of gender-bias.

We present an analysis across regions in order to capture possible heterogeneity. Previous studies, that assess inequality in Brazil, found that regional difference in income distribution is the main cause of inequality. For example, De Menezes et al. (2012) found regional inequality is diminishing for the older cohorts and is increasing, or nondiminishing, for the younger cohorts. Given that, one might think that children and/or young people are the most vulnerable family members to intra-household inequality. Therefore, this type of analysis is essential because it allows laying the foundations so that public policies can deal more effectively with poverty gaps, given the

characteristics of the aforementioned areas and the fact that an unequal distribution of resources among children is crucial because they tend to carry over into adulthood. This unequal intra-household allocation of resources can lead to a persistent and systematic intergenerational transmission of inequality that affects well-being over an individual's life-course and that are linked to poverty traps.

Our empirical results reveal the existence of inequality in the allocation of resources inside the household. In particular, we find that in Brazilian families men absorb a higher fraction of family resources than women in all family sizes. We also find that the share of total resources devoted to children increases with the number of children, but the average per child share decreases. In addition, our results suggest that adults' education level seems to be associated to a larger of his or her fraction of the total expenditure, but is negatively related with resources of her or his partner. Our finding reveal a positive effect of women's participation in the labor market and her education level with the shares devoted to their children. Our results also identify a possible heterogeneity in the allocation of resources inside the household across regions. In particular, we find that families located in Southeast and Northeast regions seems to distribute their resources more equally among their members compared to the other regions. In general terms, our results did not reject the collective model in all estimations. By contrast, we do reject the standard unitary model. Finally, our results are informatively crucial for the design of redistributive policy or social programs, because they provide a broader and more accurate view of the well-being of individuals. More precisely, they could inform policy makers about how to target individuals effectively within households in order to minimize the incidence of inequality as well as provide useful information for Conditional Cash Transfer programs (such as *Bolsa-familia*) on how to address the transfers more efficiently.

The rest of the paper is structured as follows. In the next section, we present the theoretical framework. Section 3 describes our estimation strategy, data set and sample selection. Section 4 presents and discuss the main results. Finally, section 5 concludes.

2. Theoretical Framework

In this study, we will build a framework grounded in the collective household model developed in Dunbar et al. (2013) to estimate the allocation of resources within households. The approach of Dunbar et al. (2013) identifies the resources shares using information about how to vary the household expenditure on private assignable goods with the size of household and total expenditure[9].

2.1. Collective Models and Resource Shares for Brazilian Families.

We use superscripts for goods and subscripts for type of both people and households. In particular, we assume that there are four types of households indexed by the number of children (s) in the family, where $s = \{0,1,2,3\}$. Individual types are indexed by t, with $t = f$ indicating father, $t = m$ mother and $t = c$ children. Goods are in turn indexed by k = 1,…, K. We now consider that household consume K types of good and face K-vectors of market prices denoted by $p = [p^1, \dots, p^K]'$. Let $z_s = [z_s^1, \dots, z_s^K]'$ denote K-vectors of quantities of each good k purchased by a household of size s and let $x_t = [x_t^1, \dots, x_t^K]'$ be the consumption by individual of type t. Total expenditure, which may be subscripted either for households or individuals, is represented by y. For theoretical convenience, we rule out socioeconomic characteristics as well as distribution factors

[9] Private or exclusive goods are those that are not shared or that cannot be consumed together by more than one person and assignability means that we can observe which household member consumes the good (DUNBAR et al., 2014). An intrinsic feature of private goods is that they not have any economies of scale in consumption (BROWNING et al., 2013; DUNBAR et al., 2013). The common candidate for a private assignable good is clothing, because amounts spent on clothing for each household members are usually separately observed in Consumer Expenditure Surveys (BROWNING et al., 1994).

that might change individual's preferences. We introduce below these omitted variables in our methodology description. The model allow that household have economies of scale in the consumption. The reason for this is to transform the vector of purchased quantities z_s (by a matrix A_s) into a weakly larger bundle of private good equivalents x. Each household member receive a share of this bundle, which satisfies the equality $x = x_f + x_m + x_c$. Specifically, there is assumed to exist a K by K matrix A_s such that $x_f + x_m + x_c = x = A_s^{-1} z_s$[10].

Each household member of type t to have his/her own utility function, $U_t(x_t)$. Thus, $U_m(x_m)$ represent, for instance, the utility function that women would obtain living in a household when she consume the bundle of good x_m. Nevertheless, we must understand $U_t(x_t)$ as a sub-utility over goods in a given period because individual's total utility can be influenced for the welfare of other household members, as well as for leisure and saving. Therefore, in this analysis, $U_t(x_t)$ can be interpreted only as a representation of preferences over goods of individual t as a member of a household. On the other hand, we assume for simplicity that the preferences of all children in the household are equal[11]. In addition, we consider that utility function of each household member does not depend on the size of household. This assumption implies that $U_c(x_c)$, $U_m(x_m)$ or $U_f(x_f)$ do not vary with the number of children in the household.

Similar to Browning et al. (2013) and Dunbar et al. (2013), we also make use of the assumption that allocation of goods in the household is Pareto efficient and that it does not suffer from monetary illusion. This assumption allows the existence of a monotonically increasing function $\widetilde{U_s}$ such as the household of type s buys the bundle of goods z_s as follow:

$$\max_{x_f, x_m, x_c, z_s} \widetilde{U_s}\left[U_f(x_f), U_m(x_m), U_c(x_c), p/y\right] \text{ such that } z_s = A_s\left[x_f + x_m + x_c\right] \text{ and } y = z_s' p \qquad (1)$$

The maximization problem results in the bundles x_t of private goods equivalents that each household member of type t consumes within household. Each individual faces a shadow price vector within household represented by $A_s' p$, which defines the fraction of total household resource corresponding to each member[12].

Assume that a resource share for a person of type t in a household with s children is represented by η_{ts}. These resource shares are measures of individual budget constraint at intra-household level which also represent the relative amount of household consumption for each individual. Dunbar et al. (2013) show that resource shares can be identified if we consider the existence of private assignable goods. In the study, we use clothing expenditure for each person as private assignable good.

We now consider that there is a private assignable good for each member of type t within the household. Since these type of goods are consumed by a particular member of the household, they only appear in the utility function $U_t(x_t)$ specific for each individual of type t. Denote $W_{ts}(y, p)$ as the share of household total expenditure spent by a member of type t on a private good in a

[10] According to Dunbar et al. (2013, pag.444): "*For example, suppose that a married couple without children ride together in a car (sharing the consumption of gasoline) half the time the car is in use. Then the total consumption of gasoline (as measured by summing the private equivalent consumption of each household member) is* $\frac{3}{2}$ *times* the *purchased quantity of gasoline. Equivalently, if there had been no sharing of auto usage, so every member always drove alone, then the couple would have had to purchase 50 percent more gasoline to have each member travel the same distance as before. In this example, we would have* $x^k = \left(\frac{3}{2}\right) z^k$ *for k being gasoline, so the kth row of A would consist of* $\frac{2}{3}$ *in the kth column and zeros elsewhere. This* $\frac{2}{3}$ *can be interpreted as the degree of "publicness" of good k within the household. A purely private good k would have* $x^k = 1$*".*

[11] The model could be extended and allow that children have different utility functions. Notwithstanding, this would require adding private assignable goods for each child, which we leave for future research due to limited information.

[12] The shadow price vector is the same for all household members and it will be lower than market price for goods that are consumed jointly or shared because of economies of scales in consumption (LEWBEL;PENDAKUR, 2008).

household of type s. Let $w_t(y,p)$ be the hypothetical share of total expenditure y that an individual of type t would spend on his or her own assignable good when he or she is maximizing his or her own utility function subject to individual budget constraint $p'x_t = y$. Unlike in Browning et al. (2013), these individual demand functions need not be observable. Given all these assumptions, we represent demand functions for private assignable good of each household member, which are derived from equation (1) and have the following form[13]:

$$\begin{aligned} W_{cs}(y,p) &= s\eta_{cs}(y,p).w_c(\eta_{cs}(y,p)y, A_s'p) \\ W_{fs}(y,p) &= \eta_{fs}(y,p).w_{fs}(\eta_{fs}(y,p)y, A_s'p) \\ W_{ms}(y,p) &= \eta_{ms}(y,p).w_{ms}(\eta_{ms}(y,p)y, A_s'p) \end{aligned} \tag{2}$$

Equation (2) states that the household's budget share for a person's private assignable good is equal to her resource share multiplied by the budget share she would choose herself if facing her personal shadow budget constraint. The left-hand side of expression (2) represent the household demand function W_{ts}, which is observable from the information available on household consumption with different level of expenditures and when facing diverse p regimes. In particular, we want to identify resource shares (η_{ts}) using only data from a single price regimen.

The process of identification developed by Browning et al. (2013)[14] entails two problems in our model concerning to children. Firstly, it is not possible for us to obtain information about the demand functions of children living alone. In order to shed light on this problem, Dunbar et al. (2013) assume that the parents and children have utility functions over goods that do not depend on the household size. Secondly, it is necessary to have both observed price variation and the measurement of price responses in household demand function in order to identify household consumption technology A_s.

Following the same arguments of Dunbar et al. (2013), the solution for these two problems is presented in the following two steps. First, we assume that the resource shares functions η_{ts} do not depend on y, at least at its low levels. However, resource shares can vary with associated variables such as income, wages, or wealth. Second, semi-parametric restrictions on the shapes of individual Engel Curve are imposed. More specifically, the individual resource shares are identified by comparing household demand for private assignable goods either across people within household or across households for a given type of person. In the next subsections, we will examine in more details these restrictions and our identification strategy.

2.2. Identification of Resource Shares Using Engel Curves.

We achieve the identification of individual resource shares using data only on Engel curves for private assignable goods in household with children. In particular, we follow closely the specification adopted by Dunbar et al. (2013) about Engel curves for private assignable goods, which can be written as:

$$\begin{aligned} W_{cs}(y) &= s\eta_{cs}w_{cs}(\eta_{cs}y) \\ W_{fs}(y) &= \eta_{fs}w_{fs}(\eta_{fs}y) \\ W_{ms}(y) &= \eta_{ms}w_{ms}(\eta_{ms}y) \end{aligned} \tag{3}$$

[13] The complete derivation of (2) is available in the online appendix of Dunbar et al. (2013).

[14] Browning et al. (2013) achieve identification by assuming that w_{ts} on the right-hand side is observable via the behavior of single people, leaving just one subscripted unobserved function to worry about: the resource shares η_{ts} (DUNBAR et al., 2013).

In equation (3), the main goal is identifying the resource shares without price variation[15]. Nevertheless, it is not possible to identify directly because there are two unknown functions of resource shares on the right side, η_{ts} and $w_{ts}(\eta_{ts}y)$. To deal with this problem, a pair of restrictions over preferences are imposed. In the spirit of Dunbar et al. (2013), we might assume that the preferences on private assignable goods are similar across household members and across household. For simplicity in the estimation, we assume that individual preferences over private assignable goods are represented by a PIGLOG indirect utility function, which can have the following form:

$$\begin{aligned} W_{cs}(y) &= s\eta_{cs}(\delta_{cs} + \beta_{cs} \ln \eta_{cs}) + s\eta_{cs}\beta_{cs} \ln y \\ W_{ms}(y) &= \eta_{ms}(\delta_{ms} + \beta_{ms} \ln \eta_{ms}) + \eta_{ms}\beta_{ms} \ln y \\ W_{fs}(y) &= \eta_{fs}(\delta_{fs} + \beta_{fs} \ln \eta_{fs}) + \eta_{fs}\beta_{fs} \ln y \end{aligned} \tag{4}$$

The restriction that we mentioned above are that the preferences can be similar across people (SAP) or can be similar across type of household (SAT). The SAP and SAT conditions can be used together to strengthen identification, this implies that $\beta = \beta_{cs} = \beta_{ms} = \beta_{fs}$. In this sense, household demand for private assignable good is given by:

$$\begin{aligned} W_{cs}(y) &= s\eta_{cs}(\delta_{cs} + \beta \ln \eta_{cs}) + s\eta_{cs}\beta \ln y \\ W_{ms}(y) &= \eta_{ms}(\delta_{ms} + \beta \ln \eta_{ms}) + \eta_{ms}\beta \ln y \\ W_{fs}(y) &= \eta_{fs}(\delta_{fs} + \beta \ln \eta_{fs}) + \eta_{fs}\beta \ln y \end{aligned} \tag{5}$$

for any household size s and for any type person c, m ,f. The slope of these three Engel curves can be identified across the linear regression of the private good's household budget share on $\ln y$. Since the Engel curves slope is proportional to the resource shares and these sum up to one, the three resource shares and the preference parameter can be identified. This identification strategy is attractive because we can identify the levels of resource shares for children and adults, as well as how they vary with distribution factors. This is possible using even one or both restrictions, SAT and/or SAP. Furthermore, we emphasize that this identification strategy does not need information about variation of prices and does not require detailed information of total expenditure for different goods. We only need information about the total household expenditure and expenditure on some private assignable good.

3. Empirical Approach and Data.

3.1. Estimation Method.

This section describes how resource shares for each household members are estimated using information on only Engel curves system at household level without price variation. Some socio-demographic variables omitted in the theoretical approach that can change the preference and/or resource share are included now in our model. In particular, we include the following variables in our models: residency region (dummy for each region: North, South, Northeast, Central-West (Southeast being the default); residency area (dummy variable indicating: urban or rural area); age and education level both from the household head and spouse; dummy variable for house ownership, dummy variable for ethnicity. For the children's case: number of children in the household; women's work participation; the proportion of children girls and average children age. Finally, we consider that the individual preferences are from the PIGLOG indirect utility function (AIDS). Particularly, the general budget shares equations can be written as:

[15] Functions w_{ts} offer the demand function of individual t when facing the price vector $A_s'p$ for an specific value of p. Thus, $w_{ts}(\eta_{ts}y)$=$w_t(\eta_{ts}(y,p)y, A_s'p)$ for a specific value of p.

$$
\begin{aligned}
W_{cs}\,(y) &= a + z_c + s\eta_{cs}(\delta_{cs} + \beta_{cs}\ \ln\ \eta_{cs}) + s\eta_{cs}\,\beta_{cs} \ln\ \mathrm{y} + \varepsilon_c \\
W_{ms}\,(y) &= a + z_m + \eta_{ms}(\delta_{ms} + \beta_{ms}\ \ln\ \eta_{ms}) + \eta_{ms}\,\beta_{ms} \ln\ \mathrm{y} + \varepsilon_m \\
W_{fs}\,(y) &= a + z_f + \eta_{fs}\big(\delta_{fs} + \beta_{fs}\ \ln\ \eta_{fs}\big) + \eta_{fs}\,\beta_{fs} \ln\ \mathrm{y} + \varepsilon_f
\end{aligned}
\tag{6}
$$

In order to estimate the resource shares it is necessary to impose either one or both restrictions (SAP and SAT). In this sense, three scenarios can be observed. First, when we assume the SAP restrictions, $\beta_{ts} = \beta_s$ for all individual type t. Second, if we impose the SAT restrictions, we have $\beta_{ts} = \beta_t$ for all household size s. Last, when the two conditions are imposed we have that $\beta_{ts} = \beta$ for all t and s.

The vector of 16 demographic variables is denoted by z while that vector of 3 dummy variables that represent each household type is denote by a. For each person t, the resource shares η_{ts} and the intercept preference parameters δ_{ts} are specified as linear in a and z, so they have 20 coefficients each. There are no constant terms in the resource share functions or the intercept preference parameters—the levels are captured by the three household size dummies for households with zero to three children. Since the error terms may be correlated across equations, we will estimate the system using non-linear Seemingly Unrelated Regression (SUR) method.
The estimation of equation (6) results in the share of total household expenditure on private assignable good for each member type, the resource shares η_{ts}. So, we will know how resources are allocated in the household. Following the interpretation of Dunbar et al. (2013), if resource shares are unequal, then there will be intra-household inequality. Once we controlled for a series of demographic variables, included in the z vector in equation (6), we can observe how distribution of resources within household varies with these variables.

3.2. Data and Sample Selection.

This study uses micro-level data from the Consumer Expenditure Survey (POF) collected by the Brazilian Institute of Geography and Statistics (IBGE). This survey is based on a representative sample of Brazilian households. The POF provides information on expenditures, incomes, as well as socioeconomic and demographics characteristic at the household level and the individual level. Our analysis is based on data of the most recent survey (POF 2008-2009), which has information of 55.970 representative households (IBGE, 2010). It was collected between 19 of May 19 of 2008 and May 18 of 2009.

For the purposes of this study, we restricted the sample according to the following lines: first, we exclude polygamous families or households larger than the traditional family. We called traditional family as those household formed only by married couple with or without children. Families including other relatives such as grandparents or uncles or aunts are removed. This last selection rule is quite costly in terms of data, approximately 10 percent of the initial sample, but is necessary as we do not model consumption decisions for households different from the traditional composition. More precisely, we only take couples that have of zero to three children all under 14 years of age. Families with children over 14 years also are excluded (13,02 percent) [16]. Second, we exclude the households with two or more families sharing a common residence or unit of consumption, which excludes another 9% of the sample[17]. Third, we drop household with any missing or incomplete data on the age or education level of members. Fourth, we select households

[16] The reason to exclude children over 14 years lies mainly in the fact that we have to separately identify expenditure on children's clothing from adult's clothing. The POF 2008-2009 considered household expenditure on clothing for children for all purchase or rental for individuals up to 14 years (IBGE, 2010).
[17] We are not able to differentiate the consumption patterns of two or more families sharing the same residence because the household identification in the POF is based on the address of the residence. Given this limitation, households where the unit of consumption is greater than one are excluded.

where adults are aged between 18 and 65 years, then households with members over 65 years are excluded (4,77 percent of the full sample). Fifth, we further restrict our sample to households with zero expenditure on clothing, as well as obvious outlying observations[18]. Sixth, we do not allow for men to be inactive so that we do not have a corner solution issue for men[19]. Finally, we are left with a sample of 6759 households (12,07 percent of the initial sample), which is composed for 2390 with childless couples (36,36 percent of the final sample), 2128 couples with one child (31,48 percent), 1695 couples with two children (25,07 percent), and the remaining 546 (8,07 percent) are couples with three children[20,21].

We use clothing expenditure for each person as our single private assignable good. We need information about these goods for household head, spouse, boys and girls to identify the resource shares in our model. Fortunately, for the requirements of our empirical analysis, the POF provides this information separately[22]. We remark that inclusion of a set demographic characteristic help to identify the resource shares more precisely, although they are not necessary for the identification (DUNBAR et al., 2013). The estimation of the resource shares is done based on a reference household. We define reference household as one in which all socio-demographic variables take value of zero. In particular, we include 16 socio-demographic variable: residency region (North, Northeast, South and Central-West with Southeast as the left-out category); residency area (reference category: urban location); ethnicity (reference category: non-white); the proportion of children who are girl; dummy for indicators for women's work participation and binary indicators for house ownership. Given that zero values in the age and in the level of education of the adult household members are impossible to find for the first case and rare in the second case, we use the deviation of mean values for age and deviation of model values for education in each type of household as indicator of this variables. This allows us to obtain a greater proportion of reference families. Finally, we permit that these socio-demographic variables affect the preferences and/or resource shares. Table 1 summaries descriptions of variables that we use in the estimations.

[18] This restriction is very important for the estimation of our structural model because clothing is central goods used in the identification and the estimation of our measure of inequality.

[19] Since leisure is not modeled here, this restriction allows us to avoid with a potential problem of endogeneity between leisure and consumption decisions.

[20] Dunbar et al. (2013) argue that having information about households with more than three children can be used to over-identify the model. However, we do not consider households with more than three children in this research. The main reason is based in the fact that for Brazil case is likely that in households of this type the first child is older than 14 years. Thus, we do not have private assignable good for these children, and consequently we can not identify the resource shares.

[21] We recognize that our results can be skewed or misleading if our final sample does not represent the distribution of resources within the households of the entire population. However, we believe that it is unlikely that our results change significantly. To address this potential drawback, we use the sample weights in all our estimations.

[22] For the construction of these variables, we used the questionnaire POF-4 (*Questionário de Aquisição Individual*) of POF 2008-2009. More specifically, we used Tables 34-36 of this questionnaire which provide information of expenditure at individual level of clothing for men, women and children respectively.

Table 1. Description of Variables

Variable	Description
	Characteristic and Composition of Household
Men's age	Age of adult male in the household (Deviation of Mean)
Women's age	Age of adult female in the household (Deviation of Mean)
Children's age average	Age average of children in the household
Women's schooling	Education Level of adult female in the household (Deviation of Mode)
Men's schooling	Education Level of adult male in the household (Deviation of Mode)
Female proportion	Proportion of girl children in the household
Number of Children	Number of Children in the household
House ownership	Dummy variable, 1= If adult is house owner and Otherwise = 0
Non-white	Dummy variable, 1= If person is non-white and Otherwise = 0
Women's work participation	Dummy variable, 1= If women works and Otherwise = 0
Log (total expenditure)	Logarithm of total expenditure in the household
North	Household located in the North region = 1 and otherwise = 0
Northeast	Household located in the Northeast region = 1 and otherwise = 0
Southeast	Household located in the Southeast region = 1 and otherwise = 0
Central-West	Household located in the Central-West region = 1 and otherwise = 0
Urban	Household located in the Urban area = 1 and otherwise = 0
	Goods
Men private good	Sum of total household expenditure on men's clothing
Women private good	Sum of total household expenditure on women's clothing
Children private good	Sum of total household expenditure on children's clothing

Source: Author's elaboration based on Dunbar et al. (2013) and Azimi (2015) and Information from POF (2008-2009)

4. Empirical Results and Discussion.

4.1. A first overview at the data.

We begin this section by providing some basic descriptive statistics that allow us to characterize our sample. Table 2 show this information, which is stratified by household type. We observe that men are relatively older than women. There is a gap of 3.8 years when we take the sample as a whole (on average, males are 37.9 years while females are 34.9 years). Interestingly, men and women tend to have a similar education level. In fact, considering all types of household the education level is the same, 8.2 years[23]. Small differences are observed when we analyze the different types of family. In particular, on average the level of education ranging from 7.6 (7.8) and 7.8 (7.7) years for men (women) between childless couples and couples with three children. Overall, there does not appear to be any gender bias in the distribution of children in our sample as 49 per cent of children are girls. Approximately 60 per cent of families have their own house. Almost 80 per cent reside in urban areas. In addition, we observe that more than half of the households of the sample reside in the Southeast and Northeast regions of Brazil, each regions account for 27 per cent of households. The remaining 46 per cent is divided into: 17.5 for Central-West, 13.8 for South and 14.3 per cent for North region.

Analysis of the consumption data suggests that, on average, Brazilian households spend 26,6% of their budget on food for the whole sample. As expected, the percent of total expenditure over food expenditure increases as the number of children in the household increases, standing between 25,2% for households without children and 32,4% for households with three children. Now, we consider how the budget shares destined for private assignable goods change when the household

[23] In our model we use the deviation of model values as an indicator of the level of adult education. In our case, the mode of education for both men and women is 8 years.

composition changes. We focus first on the expenditure on clothing. Note that the budget share spent by women on clothing is higher than is spent by men, in all household compositions. In line with expectations, the budget share on clothing expenditure of both men and women tend to decrease with household size. Thus, for example, in household without children, men (women) allocate 1.6% (1.9%) of their resources on clothing while that in families with one and two children allocate 1.5% (1.9%) and 1.4% (1.6%) respectively. Another important finding in this preliminary inspection of the data concerns the fact that the budget share on private assignable good for children increases as the size of the household increases. This shifting of resources from adults to children is commonly known in the literature as 'the cost of children'.

Table 2. Descriptive Statistics of the sample from the POF 2008/2009: couples with and without children

Type of Household	All Household	Childless Couples	Couples with		
			One Child	Two Children	Three Children
Expenditure (in BRL - Brazilian Real)					
Total Expenditure	22714	20784	24158	24324	20543
Budget Shares					
Food	0.266	0.252	0.260	0.276	0.324
Men Assignable Clothing	0.015	0.016	0.015	0.014	0.014
Women Assignable Clothing	0.018	0.019	0.019	0.016	0.017
Children Assignable Clothing	0.016		0.014	0.017	0.018
Household Characteristics					
Men's Education (in years)	8.2	7.8	8.7	8.3	7.7
Women's Education (in years)	8.2	7.6	8.7	8.4	7.8
Men's Age (in years)	37.9	41.5	35.2	36.5	36.1
Women's Age (in years)	34.1	38.5	31.3	32.4	31.3
Men White	0.477	0.495	0.500	0.464	0.350
Women White	0.493	0.510	0.525	0.481	0.332
House Owner	0.598	0.589	0.579	0.624	0.632
Women's Participation Dummy	0.551	0.554	0.576	0.528	0.509
Children's Participation Dummy	0.008		0.006	0.009	0.012
Proportion of Female Children	0.491		0.498	0.475	0.512
Average Age of Children	6.5		5.7	7.1	7.4
Southeast	0.274	0.296	0.284	0.256	0.194
Central-West	0.175	0.201	0.151	0.176	0.148
South	0.138	0.145	0.159	0.119	0.086
Northeast	0.270	0.233	0.272	0.301	0.333
North	0.143	0.126	0.134	0.148	0.238
Urban Resident Dummy	0.788	0.765	0.820	0.792	0.745
Sample size	6759	2390	2128	1695	546

Source: Research results.

4.2. Estimation Results.

In this subsection, we show the results of our structural model. We begin presenting the parameters estimated in the equation (6) for each household member by family size. Then, we use these estimated parameters to predict the resource shares. Tables 3 to 5 present the estimated coefficients and their standard errors for the specification (6) for men, women and children's equations, respectively. The results by household types are presented from columns (1) to (4). In particular, column (1) show the estimation for childless couples. Columns (2) until the column (4) presents the

results obtained for couples with one, two and three children respectively. We clarify that our results should be understood as the statistical correlation of the variables with the resource shares, and not as a causal effect.

We first consider the estimated coefficients for men's equation presented in Table 3. As expected, the education level matters. Men's resource shares increases with their education level, but decrease with women education. The estimated parameters are statistically significant for almost all sizes of households considered, except for families with three children. Each extra year of education of the men, everything else equal, increases his resource share by around 4.12, 1.72, 1.16 and 1.82 percentage points for childless couples, couples with one, two and third children, respectively. This result is in line with previous studies developed by Dunbar et al. (2013) and Azimi (2015), and can be understood as a gain in the bargaining power of men as a result of a higher level of education. On the other hand, the participation of women in the labor market seems to divert resources from men. The coefficients are negative and statistically significant for couples without children and with one child at level of 5%. Finally, note that demographics characteristics do appear to have significant effects over the men's resource share. In particular, man living in urban areas seem to receive more resources for all type of household, except for household with third children.

Table 3. Estimates of Parameters associated to Men's Resource Shares.

Household Type	Childless Couple	Couples with		
		One Child	Two Children	Three Children
Central-West	0.0640	-0.0366	0.0511	-0.0342
	(0.0876)	(0.0497)	(0.0500)	(0.0632)
South	0.132***	-0.0549**	-0.0853	0.0254
	(0.0522)	(0.0350)	(0.0708)	(0.137)
Northeast	0.0461***	0.0612***	0.000326	0.0497
	(0.0249)	(0.0365)	(0.0408)	(0.0705)
North	0.233***	-0.00196	-0.0136	-0.0339
	(0.0991)	(0.0378)	(0.0575)	(0.0980)
Urban	0.0232**	0.0101**	0.0193***	-0.0148
	(0.0302)	(0.0374)	(0.0319)	(0.0906)
Man Education (Deviation of Mode)	0.0412**	0.0172*	0.0116**	0.0182**
	(0.00253)	(0.0204)	(0.0147)	(0.0373)
Woman Education (Deviation of Mode)	-0.0887**	-0.0331**	0.00876	-0.0264
	(0.00281)	(0.0136)	(0.0176)	(0.0408)
Man Age (Deviation of Mean)	-0.00375***	-0.0035***	0.00168	-0.000408
	(0.00185)	(0.00211)	(0.00320)	(0.00334)
Woman Age (Deviation of Mean)	0.00376***	-0.00276	0.000283	-0.00963
	(0.00198)	(0.00308)	(0.00361)	(0.00791)
Men White	0.0516***	0.0631***	-0.00373	-0.0472
	(0.0275)	(0.0352)	(0.0390)	(0.0653)
Woman White	0.0455***	-0.00753	-0.0245	0.0557**
	(0.0172)	(0.0336)	(0.0435)	(0.0378)
House owner	-0.0364*	0.0191	0.00833	-0.0632
	(0.0257)	(0.0202)	(0.0407)	(0.0497)
Woman Participation	0.0204***	0.0145**	0.0753***	0.0842
	(0.0185)	(0.0252)	(0.0370)	(0.0681)
Children Participation		-0.0921	-0.398	-1.108
		(0.138)	(0.314)	(0.645)
Female Proportion		-0.0125	-0.00494	0.0724
		(0.0217)	(0.0401)	(0.0978)
Children Age (Deviation of Mean)		0.00354	0.00195	-0.00260
		(0.00339)	(0.00516)	(0.0121)
Sample size	2390	2128	1695	545

Source: Research results.
Notes: Standard errors are clustered at federal unit level. Standard errors in parentheses. * p<0.1**p<0.05***p<0.01.
Sampling weights applied.
Southeast Brazil is the excluded region.

Table 4. Estimates of Parameters associated to Women's Resource Shares.

Household Type	Childless Couple	Couples with		
		One Child	Two Children	Three Children
Central-West	0.0617	-0.0343	0.0724**	-0.0479
	(0.0892)	(0.0493)	(0.0449)	(0.0538)
South	0.131***	0.0623***	-0.0544	-0.0443
	(0.0502)	(0.0368)	(0.0727)	(0.142)
Northeast	-0.0507***	-0.0736***	-0.0256	0.0190
	(0.0258)	(0.0367)	(0.0334)	(0.0739)
North	0.245***	0.00549	-0.0106	-0.0491
	(0.104)	(0.0307)	(0.0267)	(0.0951)
Urban	0.0243**	0.0415**	0.0766*	-0.00450
	(0.0293)	(0.0335)	(0.0321)	(0.0983)
Man Education (Deviation of Mode)	-0.00375**	0.00867	0.0147	0.0196
	(0.00251)	(0.0188)	(0.0155)	(0.0380)
Woman Education (Deviation of Mode)	0.011**	0.0934**	0.0117*	-0.0362
	(0.00288)	(0.0150)	(0.0192)	(0.0418)
Man Age (Deviation of Mean)	-0.00342***	-0.00346*	0.00184	-0.00151
	(0.00176)	(0.00254)	(0.00281)	(0.00393)
Woman Age (Deviation of Mean)	-0.0342***	-0.0581***	0.000565	-0.0110**
	(0.00188)	(0.00251)	(0.00409)	(0.00762)
Men White	0.0489***	0.0557**	0.00301	-0.0370
	(0.0265)	(0.0340)	(0.0365)	(0.0626)
Woman White	-0.0420	-0.00165	-0.00133	0.0747*
	(0.0174)	(0.0294)	(0.0484)	(0.0396)
House owner	-0.0374*	0.00477	0.0551	-0.0955*
	(0.0254)	(0.0192)	(0.0469)	(0.0456)
Woman Participation	0.0197**	0.0259	0.0564**	0.106***
	(0.0181)	(0.0236)	(0.0383)	(0.0635)
Children Participation		-0.0977	-0.467**	-0.0881*
		(0.152)	(0.287)	(0.674)
Female Proportion		-0.00297	-0.0354	0.0845
		(0.0233)	(0.0378)	(0.106)
Children Age (Deviation of Mean)		0.00632***	0.00205	-0.000456
		(0.00353)	(0.00498)	(0.0112)
Sample size	2390	2128	1695	545

Source: Research results.
Notes: Standard errors are clustered at federal unit level. Standard errors in parentheses. * p<0.1**p<0.05***p<0.01.
Sampling weights applied.
Southeast Brazil is the excluded region.

Table 4 shows the estimated parameters of women's equation. We highlight some important coefficients. Firstly, a higher women's education is associated with increases of her resources, at less until couples with two children[24]. Unexpectedly, the coefficient for couples with three children presents a negative sign, but it is not statistically significant. This result is consistent with finding in the men's equation, where a higher women's education implies less resources for men. A positive effect is also find if the woman participates in the labor market. We have found that both a higher level of education and participation in the labor market of women can influence the allocation of resources within the household. Thus, these variables can be interpreted as a distribution factor, which implies a greater bargaining power of women reflected in the ability to obtain a greater proportion of household resources. In addition, women that live in Northeast region have a negative impact on her resource shares in household without and one child. The same cannot be said for women residing in the South region, where we find a positive effect for the same household structure. Other positive and significant effect is observed if the women live in a household located in urban area

[24] These results differ from those found by Iglesias (2016). However, he cannot offer conclusive evidence regarding this variable.

Another interesting finding are related with age of woman. We find that woman's age seems to be negative related on her resource shares. More specifically, in families composed by one and two children, an additional year reduce by around 1.1 and 9.3 percentage points the women's resources, respectively. This result align with the finding in Calvi (2015) and Azimi (2015), although the coefficients that we found are considerably different in its magnitude. A possible explication for this result is that the women lose bargaining power inside of family, because as they grow older they could become less productive.

Table 5. Estimates of Parameters associated to Children's Resource Shares.

Household Type	Couples with		
	One Child	Two Children	Three Children
Central-West	-0.0402	0.0754*	-0.0334
	(0.0459)	(0.0537)	(0.0700)
South	-0.0445	-0.0537	0.0524
	(0.0407)	(0.0800)	(0.144)
Northeast	-0.0824***	-0.0242**	0.0491
	(0.0358)	(0.0400)	(0.0745)
North	-0.00378	-0.0121	-0.0764
	(0.0375)	(0.0472)	(0.108)
Urban	0.0145**	0.0196*	-0.0456
	(0.0479)	(0.0314)	(0.0947)
Man Education (Deviation of Mode)	0.0102**	0.0230**	0.0273*
	(0.0232)	(0.0141)	(0.0361)
Woman Education (Deviation of Mode)	0.0309**	0.0207**	-0.0348
	(0.0127)	(0.0186)	(0.0394)
Man Age (Deviation of Mean)	-0.00276*	0.000789	-0.000193
	(0.00196)	(0.00320)	(0.00277)
Woman Age (Deviation of Mean)	-0.00315	0.00200	-0.00974*
	(0.00273)	(0.00459)	(0.00730)
Men White	0.0554**	0.0148	-0.0613
	(0.0367)	(0.0393)	(0.0567)
Woman White	-0.00616	-0.0309	0.0637***
	(0.0362)	(0.0416)	(0.0367)
House owner	0.0244	0.0111	-0.0610*
	(0.0234)	(0.0430)	(0.0447)
Woman Participation	0.0451***	0.0677***	0.102***
	(0.0245)	(0.0389)	(0.0611)
Children Participation	-0.0924	-0.447	-1.128
	(0.0838)	(0.272)	(0.654)
Female Proportion	0.00168	-0.0000413	0.0561
	(0.0242)	(0.0417)	(0.0951)
Children Age (Deviation of Mean)	0.00635***	0.00102**	0.00383**
	(0.00362)	(0.00547)	(0.0118)
Sample size	2128	1695	545

Source: Research results.
Notes: Standard errors are clustered at federal unit level. Standard errors in parentheses. * p<0.1**p<0.05***p<0.01.
Sampling weights applied.
Southeast Brazil is the excluded region.

The results reported in Table 5 refer to coefficient for children's equation. The most salient result is that children's age has a positive influence on their resource shares. The coefficients amount to 0.00635 for couples with one child while it amounts to 0.00102 and 0.00383 for couples with two and three children, respectively. The estimated coefficient are statistically significant at level of 1% for families with one child and at level of 5% for the rest of household type. Similar results are found by Bargain et al. (2014). On the other hand, a negative and significant effect is observed if children live in a household located in the Northeast of Brazil. In contrast, living in urban areas seems a positive influence on their resources.

It is also useful to note that the education parameters of both father and mother are only statistically significant in couples with one or two children. To be more precise, an additional year of father's (mother's) education increases the resources designated for their children in approximately 1.02% (3.09%) for couples with one child and 2.30% (2.09%) for couples with two children. As can be observed, the impact is greater when looking the parameters related with the level of education of the mother in household with one child. One possible interpretation for this outcome might be that mothers that are more educated have greater bargaining power and may have more influence on family decisions. Educated women are likely to be more concerned about the well-being of their children, and therefore may give up part of their resources or their partner's resources to increase the resources of their children, improving their well-being. Similar result is found by Azimi (2015), who found that in rural areas the mother's education diverts resources from the father to the children. In this sense, our results suggest that public policies should focus their efforts on improving mothers' education levels as a mechanism to improve the well-being of children. Finally, we did not find conclusive evidence of gender bias in favor of sons. In this issue, Braido et al. (2012) did not find evidence that support the existence of gender bias on household decisions for Brazilian families either.

4.3. Estimates of Resource Shares.

For a deeper understanding of the intra-household allocation process, we take the estimated parameters presented in Tables 3 to 5 and we use them to predict the resource shares of each household member by type of family, the main object of this study. Table 6 summarize the descriptive statistics of theses inequality measures. All the estimated resource shares take as household reference those households for which all socio-demographic variables are equal to zero, as was mentioned in previous section. In general terms, we see that resource shares are slightly larger for men than women in all family types analyzed. In particular, in column (1) is observed that men absorb on average a 53.2 per cent of household resources in childless couples. Consequently, women's resources are only, on average, 87.9 per cent of the men's resources (the remaining 46.8 per cent of total family resources)[25]. The columns (3), (5) and (7) show the share for couples with one, two and three children, respectively. The average of men's resource shares for households with one child is estimated in 41 per cent, but decreases as the number of children increases. Thus, we find that this shares standing to 37.5 per cent for couples with two children, while is around 35.6 per cent for couples with three children. These results are very similar to those obtained by Iglesias (2016), who find that the men receive about 41 per cent of family resources, while women and child extract around 39 per cent and 20 per cent, respectively.

In general, our result can be put in the same line of the existing literature. In particular with those developed by Dunbar et al. (2013) and Azimi (2015), who found that men absorb a greater proportion of household resources than women in Malawi and Iran. Opposite results are obtained by Bargain et al. (2014) on Ivorian data, where women seem to have greater bargaining power than men within the household.

Our results suggest that in Brazilian families there is inequality in the allocation of resources within the household in favor of men[26]. The gap between men and women in the resources is approximately of 6.4 percentage points in childless couples. Although this gap is relatively smaller in other types of family composition, it is still favorable to men. In particular, the gap is 0.4, 2.9 and 2.1 for families composed of one, two and three children respectively. This result is important insofar as the men - woman gap in resource allocation is significantly reduced when children begin to be part of the family. Furthermore, note that the level of the total share of household resources

[25] Of course, these shares should sum to one according to the restrictions imposed by the model.

[26] This result does not necessarily imply inequality in welfare terms, and it should be understood as inequality in the distribution of resources.

devoted to children rise as the number of children increases, but the average share allocated to each child declines. Estimations of the average children's share increase in a plausible way with household size ranging 0.23 to 0.30, while the resource share per child ranging 0.23 to 0.10.

One last comment regarding the results is in order. As mentioned above, as the family size increases, the proportion of resources allocated to parents decreases to compensate the increase in the proportion of resources received by children. A good question is: who bears in greater proportion the cost of children? The father or the mother? Is the cost divided in equal proportions? Our results suggests that women's resource shares drop by about 7 percentage points as the number of children goes from one to three, while the men's resource shares falls in approximately 6 percentage points. This implies that the cost of the children falls relatively in the same proportion for adult members, a percentage point more on the mothers. This result differs from the finding of Azimi (2015) who find that women's resource shares are most affected than of their partners. Another result is presented by Dunbar et al. (2013), who find that men's resource share increases as the family size increases, at least between families of one and three children. Men's resource share increase from 0.40 in household with one child to 0.46 in household with three children of Malawi. This finding is totally opposite from ours.

Table 6. Estimates of Resource Shares by Household Size.

			Couples with					
	Childless Couples		One Child		Two Children		Three Children	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Men's Resource Shares	.532	.6445	.410	.0842	.375	.0707	.356	.1288
Women's Resource Shares	.468	.0087	.406	.0974	.346	.1011	.335	.1466
Children's Resource Shares			.234	.0067	.279	.0083	.309	.0191
Each child			.234	.0067	.139	.0083	.102	.0191

Source: Research results

Resource shares for children are calculated from estimated values of resource shares for adults, given the restriction that household's resource shares must sum one.

4.4. Heterogeneity across Region.

Some studies that assess inequality in Brazil found that regional difference in income distribution is the main cause of inequality (see e.g., AZZONI et al., 2003). Demographic aspects could play an important role in the inequality between families and/or individuals due to differences in economic environment, population composition, cultural aspects, population growth, among others. De Menezes et al. (2012) analyzes the regional inequality evolution of income for different age cuts for Brazil. They show evidence that regional inequality is diminishing for the older cohorts and is increasing, or non-diminishing, for the younger cohorts. This evidence inspire our next analysis, because regional differences could lead to heterogeneous results in the analysis of the allocation of resources inside of the households, in particular the proportion of resources devoted to individuals considered as vulnerable members, such as children. To capture these possible heterogeneities, we estimate our model structure separately by region, then with the estimated parameters we recover the resource shares for each household member[27].

Table 7 show the estimated resource shares by region. Again, our results provide evidence of inequality in the intra-household allocation of resources in the Brazilian families, which leads us to the rejection of unitary approach. Families residing in the Southeast region seems to distribute their resources more equally among their members. Our findings show that men, women and children receive about 33 per cent of household resources, respectively. However, although this distribution

[27] The estimated coefficients of the covariates for each type of household member for the analyses of region are available upon request.

appears to be egalitarian, children continue to be disadvantaged, because on average each child absorbs only about 11 per cent of family resources[28]. Contrary to expectations, similar results are find for the Northeast region. In fact, different from previous results, women receive a slightly higher proportion of household resources than the rest of the household members. In addition, children in the North region appear to be the least favored of the entire sample considered here. On average, each child receives only about 7.3 per cent of household resources, while their father absorbs 38.6 per cent and their mother pull out about 40.1 per cent. Finally, in the Central-West region, men and women receive around 23.6 per cent and 45.4 per cent of the family resources, respectively. The children, meanwhile, extract the 31 per cent remaining. Our results show that there is heterogeneity in the distribution of resources across the different regions, this suggests that public policy that seeks to combat inequality should not ignore regional characteristics because their effects could be totally different across regions.

Table 7. Estimated Resource Shares, by Region

Region	Southeast		Central-west		South		Northeast		North	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Men's Resource Share	.333	.0434	.236	.0686	.348	.0703	.330	.0491	.3869	.0734
Women's Resource Share	.329	.0706	.454	.0755	.233	.0431	.343	.0808	.4011	.0984
Children's Resource Share	.338	.0056	.31	.0056	.419	.0078	.327	.0065	.22	.0087
Each child	.112	.0056	.103	.0056	.139	.0078	.109	.0065	.073	.0087

Source: Research results
Resource shares for children are calculated from estimated values of resource shares for adults, given the restriction that household's resource shares must sum one.

5. Final Remarks.

This research applied the collective consumption model developed by Dunbar et al. (2013) in order to analyze economic inequality among individuals of Brazilian families. To achieve this, we identified the so-called resource shares, which are considered useful measures of individual consumption expenditure and can be estimated directly from household level data. In particular, we identified each member's share of total household consumption through his or her expenditure on private assignable good. We focused only on traditional families (families composed solely of father, mother and their children). Moreover, by empirical requirements, we only considered families with zero to three children. Our empirical results reveal the existence of inequality in the allocation of resources inside the household. In particular, we find that Brazilian families allocate more resources toward men than women. To be more precise, we show that the gap between men and women in the distribution of resources is approximately of 6.4 percentage points in childless couples, but this difference decreases as the family size increases. In this sense, given the intra-household inequality that we had found, analyses based on the unitary model could lead to biased estimates.

In general, we have shown that there is an inequality in the allocation of resources in Brazilian families, which has traditionally been ignored both by researchers and by public policy makers, providing a picture incomplete and biased, especially when taking into consideration the children in the analyses. Thus, our research gives a step in the understanding of the process of distribution of resources within the household, which can be considered as an input for policy makers about how to target individuals effectively within households in order to minimize the incidence of childhood inequality. This will be possible if public policies are addressed to some type of individuals or group of individuals within households such that they can have an impact. Our study also make a clarion call to the income redistributive policies. This suggests that the design of such policies

[28] Remember that in these estimates we aggregated all families that have children.

should take into account the potential intra-household inequalities in order to define more clearly the target audience of social programs

Finally, we point out some limitations of our work that may motivate future research. First, the analysis presented here is static. Future researches should consider the dynamics in the intra-household resources allocation. Analysis over time would provide a broader view of the allocation of resources among household members. Second, to the best of my knowledge, for the specific case of Brazil, there are no studies that consider intra-household production to understand the allocation of resources. So future analyses could fill that gap.

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