RAÚL ALFONSO VELILLA GÓMEZ

INTRA-HOUSEHOLD CONSUMPTION INEQUALITY: EMPIRICAL EVIDENCE FROM BRAZIL

Dissertação apresentada à Universidade Federal de Viçosa, como parte das exigências do Programa de Pós-Graduação em Economia Aplicada, para obtenção do título de *Magister Scientiae.*

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APROVADA: 24 de fevereiro de 2017.

Maria Micheliana da Costa Silva

Elvanio Costa de Souza

Alexandre Bragança Coelho
(Orientador)

A Deus e a toda minha família.

"El Señor mismo irá delante de ti, y estará contigo; no te abandonará ni te desamparará; por lo tanto, no tengas miedo ni te acobardes"
Deuteronomio 31,8.

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BIOGRAFIA

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ABSTRACT

VELILLA GÓMEZ, Raúl Alfonso, M.Sc., Universidade Federal de Viçosa, February, 2017. **Intra-household Consumption Inequality: Empirical Evidence from Brazil** Advisor: Alexandre Bragança Coelho

The analysis of inequality has been traditionally based on measures of income at the household level, ignoring the distribution of resources within the household. In fact, the traditional analysis of inequality had been based on the unitary model of consumer behavior, which assume an equal distribution of resources among family members. In doing so, important aspects as gains from joint consumption, that could influence individual well-being, are not taken into account. This drawback has occurred because typical micro-data on consumption usually provide information at the household level instead of at individual level, making it impossible to obtain direct measures of inequality based on individual consumption. Brazil is not an exception on this issue and the analysis of how the intra-household resource allocation process is given has not received much attention and remains a puzzle. In order to fill this gap, this research apply a collective consumption model to analyze economic inequality among individuals of Brazilian families. To achieve this, we identify 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 identify each member's share of total household consumption through his or her expenditure on a private assignable goods such as clothing and footwear. Therefore, we are able to recover information about the economic well-being of household members. This study used micro-level dataset from the Consumer Expenditure Survey (POF 2008/2009) collected by the Brazilian Institute of Geography and Statistics (IBGE). Our analysis has focused on traditional families, married couples with zero to three children. Our empirical results reveal the existence of inequality in the allocation of resources inside the household. In particular, we found that in Brazilian families men absorb a higher fraction of family resources than women in all family sizes. We also found 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. Furthermore, our results identify a possible heterogeneity in the allocation of resources inside the household across regions. In particular, we found 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, 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.

RESUMO

VELILLA GÓMEZ, Raúl Alfonso, M.Sc., Universidade Federal de Viçosa, fevereiro de 2017. **Desigualdade Intra-domiciliar no Consumo: Evidência Empírica para o Brasil.** Orientador: Alexandre Bragança Coelho.

A análise da desigualdade tradicionalmente tem-se baseado em medidas de renda em nível domiciliar, ignorando a distribuição de recursos dentro do agregado familiar. De fato, a análise tradicional da desigualdade baseia-se no modelo unitário de comportamento do consumidor, que assume uma distribuição igualitária dos recursos entre os membros da família. Ao fazê-lo, aspectos importantes como os ganhos decorrente do consumo conjunto, que poderiam influenciar o bem-estar individual, não são levados em consideração. Esta desvantagem ocorre porque os microdados sobre o consumo costumam fornecer informações ao nível do agregado familiar, em lugar de fornecê-lo ao nível individual, tornando impossível obter medições diretas da desigualdade com base no consumo individual. O Brasil não é exceção nesta questão e a análise de como o processo de alocação de recursos dentro dos domicílios é dado não tem recebido muita atenção e continua sendo um enigma. Para preencher essa lacuna, esta pesquisa aplica um modelo de consumo coletivo para analisar a desigualdade econômica entre indivíduos de famílias brasileiras. Para alcançar este objetivo, identificaram-se as chamadas parcelas de recursos, que são consideradas medidas das despesas de consumo individual e podem ser estimadas diretamente a partir de dados em nível domiciliar. Em particular, foi identificada a participação de cada membro no consumo total de sua família, por meio de suas despesas com bens privados, como roupas e sapatos. Assim, informações sobre o bem-estar econômico de cada membro da família foram obtidas. Este estudo utilizou microdados da Pesquisa de Orçamentos Familiares (POF 2008/2009) coletada pelo Instituto Brasileiro de Geografia e Estatística (IBGE). A análise foi restrita a famílias tradicionais, ou seja, casais sem ou com até três filhos. Os resultados empíricos revelaram a existência de desigualdade na alocação de recursos dentro dos domicílios. Em particular, verificou-se que nas famílias brasileiras 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. Além disso, os resultados sugerem que o nível de educação dos adultos parece estar associado a uma maior parte de sua fração na despesa total, mas negativamente relacionado com os recursos de seu parceiro. Por outro lado, constatou-se um efeito positivo da participação das mulheres no mercado de trabalho e seu nível de educação sobre as parcelas dos recursos de seus filhos. Ademais, os resultados identificam uma possível heterogeneidade na alocação de recursos dentro do agregado familiar entre as regiões. Em particular, verificou-se que famílias localizadas nas regiões Sudeste e Nordeste parecem distribuir seus recursos de forma mais igualitária entre os seus membros comparados com às outras regiões. 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.

CHAPTER 1

INTRODUCTION

1.1. Context

Brazil is well known for being one of the most unequal countries in the world. Since the beginning of the XXI century, however, inequality rates have decreased considerably. 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)[1]. 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 have also been considered as factors which played an important role in such a inequality decline (DE SOUZA, 2012; ARNOLD; JALLES, 2014).

Although social disparities have been reduced in recent years in Brazil, inequality is still high and lingering. By contrast, systematic patterns of increasing social gaps have been observed at the regional level during the last years in Brazil (DE MENEZES et al., 2012). This suggests a redesign of income redistribution policies and more effective government interventions for the reduction of social inequality in Brazil. A vast literature has studied inequality phenomenon for the Brazilian context over time (see 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.

The understanding of the causes of inequality must consider the resources allocation process within household. One way to understand the inequality among individuals would be by comparing their level of income. However, contrary to this idea, Rodríguez (2016) argues that income is an imperfect measure of welfare because such indicator tend to be underestimated by individuals. Instead, consumption

[1]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).

expenditure would be a more appropriated indicator for the analysis of inequality. Notwithstanding, empirical evidence using such measure of well-being has mainly focused on the consumption inequality at household level, which is the basis of the traditional unitary model of consumer behavior[2]. 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[3]. An intrinsic feature of the collective model is the so-called resource shares[4], which are useful measures of individual consumption expenditure, which 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.

1.2. Research Question and Contribution

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. The literature on this topic has mainly focused on inequity among households. Yet studies attempting to measure the extent of inequality within households and to assess how it contributes to overall inequality are relatively rare. These inequality measures usually have been estimated using information about income and anthropometric conditions (e.g., HADDAD; KANBUR, 1990; MORADI; BATEN, 2005; SAHN;

[2]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).

[3] 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). In chapter 2, we offer a slight review of the literature on collective models for a better understanding.

[4] 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).

YOUNGER, 2009; RODRÍGUEZ, 2016). Few measures have used consumption, which has been documented as a more accurate measure of living standards than income (see e.g., DEATON, 1997; DEATON; ZAIDI, 2002; MEYER; SULLIVAN, 2011, 2012, 2013), for discerning how intensive the inequality is for different members of society. Most of studies on inequality ignores the intra-household distribution of resources by assuming that all individuals receive equal share of resources within households (see e.g., ATKINSON, 1970; LEFF, 1972). 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. In order to fill this gap, this study will examine within- household consumption inequality in Brazil. Therefore, knowledge of resources allocation within households might contribute to the construction of a more accurate measure of overall inequality among individuals.

We consider consumption expenditure to be a more accurate measure of living standards of individuals than income for at least two reasons. First, income can exhibit a great deal of seasonal variation, whereas consumption is smoother, less variable and it is not closely tied with these short-term fluctuations (DEATON; ZAIDI, 2002). The smoothness in consumption could be facilitated because people might adapt or use credit, get donations or sell their assets in order to keep their consumption standard (WARD, 2014). Second, there are no obvious reasons to underreport consumption as compared with income (ALMÅS; JOHNSEN, 2012). Respondents might underreport income if they suspect that these data could become available to the tax authorities. Given these arguments, in this study, consumption data rather than income are taken as proxy of economic well-being[5].

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

[5] We recognize that inequality is a multidimensional phenomenon and other welfare measures must be considered, see e.g., Sen (2009). However, consumption expenditure is our choice for aforementioned reasons.

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[6]. This is of particular interest in view 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. 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[7]. Nevertheless, 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.

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),

[6] 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.
[7] 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.

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 relative 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 more deeply 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 are 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 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.

Following the proposed approach of Dunbar et al. (2013), we can test empirically for consumption inequality and gender bias in intra-household resource allocation in Brazil. In comparison with Browning et al. (2013), Lewbel and Pendakur (2008), Bargain and Donni (2012) and Bargain et al. (2014), such framework does not need to use information on childless households (either couples or singles) nor distribution factors[8]. Thus, the identification strategies we use impose milder conditions on preference stability across household types. As in Dunbar et al. (2013), we use information on private assignable goods, such as clothing and footwear, in household-level expenditure data to estimate the share of household resources allocated to each family member[9]. Estimation of the resource shares through the methodology proposed by Dunbar et al. (2013) provide us a view of inequality within households. This analysis might change the traditional estimates as well as our perspective of the analysis of the inequality phenomenon and our understanding of the factors associated to its trends. Finally, our study also make a clarion call to the income redistributive policies. This suggests that the design of such policies should take into account the potential intra-household inequalities in order to define more clearly the target audience of social programs. This is important because there is evidence that outcomes in household behavior is different depending on who receives the transfer within household.

[8] Distribution factors are defined as observable variables that affect the resource shares but not change individual's preference (LEWBEL; PENDAKUR, 2008). In the terminology of Cherchye et al. (2015) distribution factors are considered as observable household or neighborhood characteristics that can change the Pareto weights in the problem of household's optimization but not change the individual preferences or the household budget set. Browning et al. (2013) show that the resource shares and Pareto weights present a relationship of one to one when the individual utility is analyzed in a collective household approach.

[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). In the case of Brazil, the *Pesquisa de Orçamentos Familiares* (POF) only have separate expenditure information of each household members for clothing and footwear. Thus, by theoretical and methodological reasons, we use the sum of clothing and footwear expenditures for each person as our private assignable good in order to identify the resource share. See, e.g. Bourguignon et al. (2009), Cherchye et al. (2009) and Cherchye et al. (2015) among others for a good discussion on how assignable goods can aid in the identification of resource shares.

1.3. Hypothesis

- There is consumption inequality within households in Brazilian society.
- There is a gender bias against girls in intra-household resource allocation in Brazilian families.
- Intra-household resource allocation inequality is different across Brazilian regions.

1.4. Objectives

1.4.1. General Objective

Assess within-household consumption inequality in Brazil.

1.4.2. Specific Objectives

- Identify the distribution across households of the shares of family resources devoted to each household member.
- Identify how distribution of resources within Brazilian households varies with demographic variables.
- Assess intra-household inequality across Brazilian regions.
- Investigate empirically gender bias in intra-household resource allocation using a collective household model.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to provide a brief review on the main theoretical and empirical aspects that underlie the collective household models. In particular, the chapter is mainly based on Donni and Chiappori (2011) and Vermeulen (2002). We first summarize the general characteristics of the unitary model taking into account the main advantages and disadvantages of such framework. Then, by focusing on the updated survey about the collective household models, we then present the main types of non-unitary models.

2.1. From the unitary model to the collective model of household behavior.

The traditional microeconomic theory of household behavior has been using the so-called 'unitary models' (or 'common preference' models) for the economic analysis of family behavior. These models view households as behaving like a single decision-making unit, which maximizing a well-behaved utility function subject to a household budget constraint that includes the resources of all family members (BECKER, 1965, 1981)[10]. This optimization program leads to the well-known restrictions of adding-up, homogeneity of degree zero in both prices and total family income, and the restrictions of symmetry and negative semi-definition on the Slutsky matrix associated to the corresponding demand system (VERMEULEN, 2002).

The key assumption of the unitary model is the so-called 'income pooling hypotheses'. This implies that all individual incomes are pooled as a single household

[10] In the literature, two mechanisms are known by which a family's common preference can be reached. On the one hand, the common preference may be the results of a consensus among all household members (SAMUELSON, 1956). Families composed by more than one individual, each one with their own rational preferences, decide by consensus and maximize a social welfare function given a family budget constrained that take into account the income of all family members. In this case, it is not important to know how households reach a consensus on what should be the joint utility function of the household nor how this consensus is maintained. On the other hand, a dictatorial and altruist member can enjoin the household's preference (BECKER, 1974, 1981). In the Becker's approach (also known as 'Rotten Kid Theorem'), the family is composed by a group of purely selfish but rational 'kids' and one altruist parent that have a utility function, which reflects interest and concern for the welfare of all members of the family. The resulting optimization program consist in maximizing the altruistic utility function, given the family budget constraint. Therefore, we can conclude that both Beckerian altruistic approach as Samuelson approach converges to the unitary model.

income, which is supposed to be allocated between household members to maximize the family utility function. This suggests that only the total family income matters for the explanation of household behavior and not the distribution of such resources among each household member (VERMEULEN, 2002; DONNI; CHIAPPORI, 2011). In other words, it is irrelevant who receives income or who has the control of resources in the household expenditure behavior (LUNDBERG et al., 1997; XU, 2007).

In spite of the evident advantages of the unitary model in terms of its simplicity and its testable restrictions on household behavior, this approach has been questioned and disproved by many researchers both on methodological, empirical and welfare economic context. Methodologically, the unitary model is characterized by describing group choices (e.g. households), but does not have the tools to describe individual-made choices within these groups, which is the core of the neoclassical theory of utility. This characterization has led to force the single utility framework with households that consist of multiple individuals, which in the empirical light is not satisfactory when analyzes are performed for individuals with different preferences. In other words, through the unitary approach it is not possible to recover individual preferences of household members neither the associated parameters that characterize the internal negotiation process.

At the empirical level, the income pooling hypothesis and the symmetry of the Slutsky matrix have been strongly rejected all across the world. Among some important papers that reject the unitary model (specially 'income pooling hypothesis'), we can mention Thomas (1990), Schultz (1990), Bourguignon et al. (1993), Phipps and Burton (1996, 1998), Browning et al. (1994), Lundberg et al. (1997), Fortin and Lacroix (1997), Quisumbing and Maluccio (2003) and Rangel (2004). The symmetry of the Slutsky matrix, in turn, has been reject by Blundell et al. (1993), Browning and Meghir (1991), Browning and Chiappori (1998), among others.

The influential and pioneering works on the rejection of the unitary model were developed by Thomas (1990) and Schultz (1990). In particular, Thomas (1990) shows that unearned income controlled by the wife has a greater effect on the health of the Brazilian families than income controlled by the husband. Additionally, he finds that mothers tend to devote more resources to improve weight and height of their daughters compared to the amount allocated to their sons, while that fathers tend to allocate more

resources to their sons. Schultz (1990), meanwhile, using data on adults between 25 and 54 of age from Socioeconomic Survey of Thailand of 1980/1981, investigates whether there are different effects of unearned income of husbands and wives on female labor supply and fertility. He observes that unearned income of wives has a bigger effects than unearned income of husband on female labor supply, while does not have effect on male labor supply. Thus, increases in unearned income of wife reduce significantly her labor supply. In addition, he observes that unearned income of women has a positive effect on number of children, but unearned income of men does not.

Bourguignon et al. (1993), analyzing French data, find that the share of own income of husbands and wives have effects significantly in the consumption structure inside the household. Thus, the intra-household composition of family income is determinant in household behavior patterns, even when total income remains constant. Browning et al. (1994) provide evidence that the final allocations of expenditure of each member of Canadian couples depend significantly on their level of lifetime wealth and of their income and relative ages. Lundberg et al. (1997), considering a policy change that transferred a substantial child allowance from husband to wives in the United Kingdom in the late 1970s, also find evidence against of the unitary model. Specifically, they show that the policy changes produce increases on expenditure in the women's and children's clothing as compared to men's clothing due to the new re-distribution of income inside the family.

Finally, in the context of the welfare analysis, the unitary model is seen as a black box, because it does not provide an adequate description of the processes of resource distribution and decision making within the families (FORTIN; LACROIX, 1997; BROWNING, 1992; CHIAPPORI, 1992, 1988; VERMEULEN, 2005; LUNDBERG; POLLAK, 1996). The common approach suffers important limitations due to incomplete information on effects of policies inside the family, in particular, those policies designed to benefit certain classes of household members such as children or women. This is so because under the unitary model only the total household income can influence the household expenditure patterns, and not the individual who earns this income. The unitary model neutralizes the specific transfers made by the household allocation mechanism. Thus, for example, a dollar transferred to the wife has the same effect if is transferred to the husband. Under this type of approach, researchers can make mistaken and biased conclusions. Policymakers might consider this type of policy as

ineffective, even if they improve the total family resources (LUNDBERG; POLLAK, 1996).

In this sense, if the welfare of individuals are the ultimate object of concern for economic policy, an approach that does not taken into account the individuals preferences of each household members cannot offer entirely satisfactory results. Thus, knowledge of resource allocation within the household can lead to efficiently targeting the population group of concern in policy and social program designs, that seek to improve individual well-being, and consequently, the welfare of the family as a whole.

In view of theses theoretical and empirical weaknesses that the unitary approach suffers, in the last two decades a large body of literature have emerged that take into account the different decision-makers by using game theory elements. These 'non-unitary' approaches can be classified under the follow categories: the first, the non-cooperative or strategic models (see e.g., BECKER, 1973; CHEN; WOOLLEY, 2001; LUNDBERG; POLLAK, 1993). The second, the cooperative models (see e.g., MCELROY; HORNEY, 1981; MANSER; BROWN, 1980; LUNDBERG; POLLAK, 1993; MCELROY, 1990). Third, the collective models (see e.g., CHIAPPORI, 1988, 1992)[11].

The non-cooperative models of the family make use of the concept of Cournot–Nash equilibrium. This type of models is characterized by assuming that each household member maximizes his or her own utility given its budget constraint, and taking the behavior of others member of household as given (CHEN; WOOLLEY, 2001)[12]. Consequently, and in contrast with cooperative models, this approach usually does not lead to results that are Pareto dominant[13].

On the other hand, cooperative models are based on the axiomatic bargaining theory with symmetric information. This kind of models arises from the observed behavior of individuals when they decide to form households because it is more

[11] The collective model may be consider a special type of cooperative bargaining model with the characteristic that it does not require the specification of the bargaining process.
[12] This is because, under the non-cooperative approach, the individuals cannot enter into binding and enforceable contracts.
[13] To assume that intra-household allocations do not necessarily produce outcomes Pareto efficient implies that, in some cases, the well-being of an individual can be improved without affecting the well-being of the other members of the family.

beneficial for them to live in family than to live alone. Living as a couple could generate economies of scale in the production and consumption of goods. Hence, given cooperation, the process of negotiation between members of the household always leads to Pareto efficient outcomes. However, Vermeulen (2002) considers that assuming a specific structure on decisions of allocation is an important limitation of this type of models. In particular, Vermeulen (2002) points out that if the empirical implications is rejected, then it is not possible to determine whether the particular choice itself or the bargaining setting is being rejected.

Despite the different alternatives presented above, a good deal of recent literature has been focusing the attention on a type of cooperative models that does not impose a priori restrictions on which point on the Pareto frontier that will be chosen by the household. These are the so-called collective models of household behavior, which are analyzed in great part of this work[14]. The collective framework, pioneered by Chiappori (1988, 1992) and Apps and Rees (1988), has become the paradigm through which researchers from different areas are studying household allocation decisions. This approach describes the household as a set of individuals, which have their own preferences, and an intra-household bargaining process to make decisions[15]. Chiappori (1992) explains that the collective model can be understood as a process of choice in two stages. In the first stage, the family income are pooled and then is divide between household members, according to some predetermined sharing rule[16]. In the second stage, once family resources have been divided, each decision-maker maximizes their own utility sub-function given an individual budget constraint equal to his or her share of pooled resources.

The collective approach is based on the assumptions that the decision-making process inside the household is stable and reach Pareto efficient intra-household allocations. The assumption of stability implies that the individual preferences are not changing suddenly and capriciously from moment to moment (BROWNING et al.,

[14] For a more detailed overview on the non-cooperative models, see e.g. Alderman et al. (1995).
[15] The unitary model can be understood as a special case of the collective model where the bargaining power of the household members are equals and fixed (ALDERMAN et al., 1995).
[16] The sharing rule are a useful measure of relative bargaining powers of each household member that describes how resources are distributed inside the household. This suggests that the sharing rule can be interpreted as a measure of economic well-being of household members. See Lise and Seitz (2011), Lewbel and Pendakur (2008), Bargain and Donni (2012), Browning et al. (2013) and Dunbar et al. (2013) for an important works that make use of the sharing rule concept.

2014)[17]. In its turn, the efficiency assumption formally defines the collective model, which implies that the decision process between individuals inside the family reaches binding agreements that leave no usefulness on the table (CHIAPPORI, 1992; BROWNING et al., 2014). In other words, given any choice among household members, it is not possible to make an individual better off, without making the other household members worse off. However, it is not obvious that household members with heterogeneous preferences achieve Pareto efficient allocations. In this regard, Browning et al. (2014) suggest that the assumption of efficiency can be justified by the fact that spouses interact frequently, so that each partner knows the preferences, resources and behavior patterns of the other. Therefore, we would expect that any possibilities of Pareto improvement will be exploited.

There is substantial empirical evidence that support this theoretical framework. For example, Rangel (2004) investigates the changes in the relative price of 11 commodities for the farm households in Ghana aiming to determinate whether the unitary model or whether the collective model best fits the behavior patterns of these households. Rangel (2004) does not reject the unitary model for households formed by a single adult member, but rejects when analyzing households consisting of more than one adult member. In addition, his results shows that the household formed by more than one adult can achieve efficiency in the allocation of their resources and that households with more than two adults present a behavior as a two-decision makers group. Finally, he concluded that the collective model best fits the behavior of multi-individual households.

Exploiting the changes in women's income generated by Mexican conditional cash transfer program '*Progresa/Oportunidades*' and the changes due to localized rainfall shocks, Bobonis (2009) finds evidence in favor of efficiency optimality of collective model. Bobonis (2009) results explain how changes in control over resources by women within the household produce a positive effect on children's goods expenditure, as well as changes due to rainfall shocks have less effect on the purchases

[17] This assumption seems little realistic due to that individual preferences of today may not be related to individual preferences of yesterday. In fact, in the real world individuals are faced with factors that may force them to change their preferences and their decision process. Example of these factors are prices and income. However, Browning et al. (2014) argues that, to be able to make predictions, a minimum level of stability is necessary, that is, the households under collective approach should be characterized by having a unique decision process. The advantage of this assumption is that we do not have the need to specify the mechanism that household use to achieve the stability, we simply assume that such a mechanism exists.

of public goods for the household. Attanasio and Lechene (2014) test collective models through two distribution factors using the same dataset that Bobonis (2009). They estimate demand systems both with and without distribution factors[18]. Their main result suggests that the demand system without distribution factors is not stable and cannot predict the impact of the program. In contrast, the demand system with distribution factors can predict the impacts of the program more accurately than the unitary model. Last, they cannot reject the efficiency hypothesis.

Alam (2012), investigating the effect of male and female self-employment returns to borrowing on intra-household resource allocation in rural Bangladesh, finds that different sources of income affect differently the allocation of resources within the household (a clear evidence against income pooling hypothesis). In addition, he finds that the bargaining power of women borrowers increases inside the household, and as a consequence, they have a greater participation in family decisions. The greater women bargaining power is reflected in the greater allocation of their resources toward goods more valuable to them.

Although a large body of literature fails to reject the null hypothesis that households achieve Pareto efficient resource allocation, some works suggest that the decision process can be Pareto inefficient as a consequence of asymmetric information among household members or imperfect marital contracts (LUNDBERG; POLLAK, 2003). For example, in a seminal work, Udry (1996) finds evidence of inefficiency in agricultural production decisions in the farm households of Burkina Faso. In particular, he finds that the level of productivity of plots planted with the same crop, in the same year and within the same household, is relatively greater in those under the control of men than those controlled by women. Specifically, the author estimates a 10 to 15 per cent potential increases in the value of family agricultural output if a reallocation of input is taken into consideration. He suggests that a reallocation of productive inputs from the women's plots to the men's plots could improve production efficiency.

In a related study for Côte d'Ivoire, Duflo and Udry (2004) observe that crops are affected differently by the same rainfall shocks because men and women specialize

[18] The two plausible distribution factors used by Attanasio and Lechene (2014) are the random allocation of a cash transfer to women (considered as an exogenous shifter in female bargaining power) and kinship networks within the village of the husband and wife.

in the production of different crops. More specifically, they find that periods in which the rainfall shock affect positively the men's crops the family allocates a greater share of its resources on alcohol, tobacco and exclusive goods for men. Meanwhile, in the periods where the women's productions is good, the family spends a greater proportion of its resources on food and exclusive goods for women.

Dercon and Krishnan (2000) investigate the relationship between the literature about smoothing of consumption, risk sharing and collective household model. They use data on adult nutrition from rural households in Ethiopia to know whether individuals can smooth their consumption over the time and within the household. They find that poorer households do not have this ability. Furthermore, Dercon and Krishnan (2000) use unpredicted illness shocks to test for risk sharing within the household. They report that poor households living in the South do not participate in complete risk sharing between household members. As a consequence of this finding, in this context, the assumption that the household allocations are Pareto efficient is rejected.

Goldstein and Udry (2008) analyze the relationship between a set of ambiguous and complex land rights on productivity and agricultural investment in Akwapim, a small city in Eastern Region of Ghana. The authors find that individuals who hold powerful positions in a local political hierarchy have a greater secure tenure of their plots. Therefore, they are able to make greater investment in the fertility of their land generating a greater production. Individuals who hold a weak tenure security of their plots are less likely to leave their land fallow, which leads to productive inefficiency.

In Uganda, Andrews et al. (2014) find evidence against efficiency in the male and female labor allocation in agricultural productive households. They observe significant differences in productivity levels through gender: men are relatively more productive than their female counterparts. Besides, they show that there is an inefficient allocation of labor input, since men are relatively more productive in plots under the control of women than in plots under their control. This suggests that there is room for improvement in the Pareto sense in household's outputs if there is a reallocation of labor inputs.

In general, the empirical evidence about collective models is inconclusive because fails to reject Pareto efficient in the analyses of intra-household consumption decisions, but finds evidence of inefficiency when the intra-household productions decisions are studied. Recently, Angelucci and Garlick (2015), taking the same database that Bobonis (2009) and Attanasio and Lechene (2014), show that there are differences in the efficiency in intra-household resources allocation within the sample. They find that the assumption of Pareto efficiency of household expenditure is rejected for younger household but not for older household. The findings of Angelucci and Garlick (2015) suggest that tests for validity of cooperative household models may be misplaced, so research on family economics should develop models that take into account different groups of households. Given this empirical inconsistence, the challenge for family economic researchers is to develop models which allow such questions to be taken into account.

CHAPTER 3

THEORETICAL FRAMEWORK

3.1 Collective Models of Household Behavior and Resource Shares.

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. 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 that might change individual's preferences. We introduce below these omitted variables in our methodology description.

This approach allows 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 our 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. Unlike Browning et al. (2013), the preferences of an individual as a member of a household may be different regarding if she or he is living alone. On the other hand, we assume for simplicity that the preferences of all children in the household are equal[19]. However, we will introduce in our empirical application characteristic such as age and sex of children in order to check potential discrimination.

[19]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.

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.

Following the same arguments of Browning et al. (2013) and Dunbar et al. (2013), we make use of the assumption that household have economies of scale in 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 $x_f + x_m + x_c = x = A_s^{-1} z_s$. In comparison with traditional collective models, this approach has the advantage of taking into account consumption as a joint activity instead of considering it only as an activity either purely private or purely public[20]. 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[21].

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

[20] 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* $x^k = 1$*".*

[21] 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).

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 the sum of clothing and footwear expenditures 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 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[22]:

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

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.

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

The process of identification developed by Browning et al. (2013)[23] 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 sections, we will examine in more details these restrictions and our identification strategy.

3.2 Identification of Resource Shares Using Engel Curves.

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

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

In equation (3), the main goal is identifying the resource shares without price variation[24]. Nevertheless, it is not possible to identify directly because there are two

[23] 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).

[24] 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.

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. First, we might assume that the individuals have identical preferences. This assumption implies that w_{ts} does not change across person type t. Second, the preference might not vary across household type, which means that w_{ts} does not change with s. However, these are strong and probably unrealistic assumptions. We take a middle ground to achieve our identification. Following Dunbar et al. (2013), it is not necessary that the entire functions w_{ts} to be independent of variation in person t or variation in household size s. So, it is only necessary that a separate fraction of w_{ts} to be independent either of t or of s. For that, suppose that budget share functions w_t present linear form in functions of expenditure:

$$w_t(y,p) = h_{t0}(p) + h_{t1}(p)g_1(y) + h_{t2}(p)g_2(y) + \cdots + h_{tL}(p)g_L(y) \quad (4)$$

with $h_{tl}(p)$ representing the price-varying functions that multiply the functions of expenditure $g_l(y)$. Meanwhile, private assignable budget share equations can be written as:

$$W_{ts}(y) = \eta_{ts}h_{ts0} + \eta_{ts}h_{ts1}g_1(\eta_{ts},y) + \eta_{ts}h_{ts2}g_2(\eta_{ts},y) + \cdots + \eta_{ts}h_{tsL}g_L(\eta_{ts},y) \quad (5)$$

where $h_{tsl} = h_{tl}(A_s,p)$ for m, f. In turn $W_{cs}(y)$ can be defined in the same form. The identification could be obtained in two ways. First, assuming that any $h_{tl}(p)$ is independent of t so the coefficient h_{tsl} reduce its dependence on t. In this case, preferences would not be identical across people (indexed by t) but would be similar across people, due to the fact that one separable part of the budget share function is the same for all people. Second, if any $h_{tl}(p)$ is independent of p so that the corresponding coefficient h_{tsl} reduce its dependence on s. In this case, preferences would not be identical across household types, but for any given person they would be similar across household types. These two formulations allow identification, but not all can be rationalized with a utility function. We show below what restrictions can be rationalized with individual utility functions and which can be used to achieve identification of individual resource shares.

3.2.1 Identification if Preference are Similar Across People.

In this section, we start by focusing in the identification when preference are similar across people (hereafter, SAP). The SAP restriction show how the private assignable goods vary across people, so it is necessary to use the same good for all people. This assumption implies that Engel curves for the private assignable good present the same shape across people, at least at the lower expenditure levels. These Engel curves can be represented as:

$$w_t(y,p) = d_t(p) + g\left(\frac{y}{G_t(p)}, p\right) \text{ for } y \leq y^*(p) \tag{6}$$

where y^* is a real expenditure threshold. Function g represent the shape of budget share functions that in turn is the same for all people. However, the budget share functions can be different either by the person-specific additive term $d_t(p)$ or by the person-specific expenditure deflator $G_t(p)$. Preferences would be identical across people if $d_t(p)$ and $G_t(p)$ were the same for all people. Replacing equation (4) into (3) yields:

$$\begin{aligned} W_{cs}(y) &= s\eta_{cs}\delta_{cs} + s\eta_{cs}\gamma_s\left(\frac{\eta_{cs}y}{\Gamma_{cs}}\right) \\ W_{ms}(y) &= \eta_{ms}\delta_{ms} + \eta_{ms}\gamma_s\left(\frac{\eta_{ms}y}{\Gamma_{ms}}\right) \qquad \text{for } y \leq y^*(p) \\ W_{fs}(y) &= \eta_{fs}\delta_{fs} + \eta_{fs}\gamma_s\left(\frac{\eta_{fs}y}{\Gamma_{fs}}\right) \end{aligned} \tag{7}$$

where $\delta_{ts} = d_t(A_s'p)$; $\gamma_s(y) = g(y, A_s'p)$ and $\Gamma_{ts} = G_t(A_s'p)$. As mentioned above, g do not change across people. The shadow price vector $A_s'p$ is used to evaluate the three above equations, which yield the function γ_s that does not change across people. For simplicity in the estimation, we assume that individual preferences over goods are represented by a PIGLOG indirect utility function[25]. An example is the popular Almost Ideal demand system (AIDS) or the Quadratic Almost Ideal demand system (QUAIDS). Applying Roy's identity to PIGLOG indirect utility function, we obtain the budget share function for each individual private assignable good, which have the following form:

$$w_t(y,p) = d_t(p) + \beta(p)\ln y \tag{8}$$

[25] PIGLOG indirect utility functions developed by Muellbauer (1976) can be specified as $V_t(p,y) = b_t(p)[\ln y - \ln a_t(p)]$. The restriction SAP, for his part, can be defined as $b_t(p) = b(p)$

where $d_t(p)$ is a function of $a_t(p)$ and $b(p)$. Meanwhile, $\beta(p)$ is the negative of price elasticity of $b(p)$ with respect to the price of the private assignable good. Substituting the budget share function into equation (3) yields:

$$\begin{aligned} W_{cs}(y) &= s\eta_{cs}(\delta_{cs} + \beta_s \ln \eta_{cs}) + s\eta_{cs}\beta_s \ln y \\ W_{ms}(y) &= \eta_{ms}(\delta_{ms} + \beta_s \ln \eta_{ms}) + \eta_{ms}\beta_s \ln y \\ W_{fs}(y) &= \eta_{fs}(\delta_{fs} + \beta_s \ln \eta_{fs}) + \eta_{fs}\beta_s \ln y \end{aligned} \tag{9}$$

where $\delta_{ts} = d_t(A_s' p)$ and $\beta_s = \beta(A_s' p)$ for any household size s. 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. We have four equations (three Engel curves and resource shares summing to one) in four unknowns (three resource shares and the preference parameter β_s). Consequently, resource shares are exactly identified from a single household's Engel curves for the private assignable good for each of its three members (DUNBAR et al, 2013).

3.2.2 Identification if Preference are Similar Across Type.

We now turn attention to identification when preferences are similar across household type for a specific person (hereafter, SAT). Denote $p = [p_m, p_f, p_c, \bar{p}, \tilde{p}]$ where $\bar{p}$ represent the subvector of p equivalent to purely private goods other than the private assignable goods. In turn, $\tilde{p}$ represent the subvector of p equivalent to all the other goods. Denote L as the total number of private goods. The Engel curves for the private assignable good for preferences that are similar across type are given by:

$$w_t(y, p) = g_t\left(\frac{y}{G_t(\tilde{p})}, p_t, \bar{p}\right) \text{ for } y \leq y^*(p) \tag{10}$$

where y^* is a real expenditure threshold. As mentioned above, this restriction is only applied at low expenditure levels. In this case, non-private goods present scale economies related with the expenditure deflator $G_t(\tilde{p})$ for a specific person. In our application, we permit that preferences change with the expenditure deflator $G_t(\tilde{p})$. This implies that preferences are only similar across type. We now consider that SAT

restriction is applied over cross-price effects of non-private goods on the private assignable good[26]. Replacing equation (8) into (3) yields:

$$\begin{aligned} W_{cs}(y) &= s\eta_{cs}\gamma_s\left(\frac{s\eta_{cs}y}{\Gamma_{cs}}\right) \\ W_{ms}(y) &= \eta_{ms}\gamma_s\left(\frac{\eta_{ms}y}{\Gamma_{ms}}\right) \\ W_{fs}(y) &= \eta_{fs}\gamma_s\left(\frac{\eta_{fs}y}{\Gamma_{fs}}\right) \end{aligned} \tag{11}$$

where $\gamma_s(y) = g_t(y, p_t, \bar{p})$ and $\Gamma_{ts} = G_t(\tilde{A_s}\tilde{p})$. In this case, the function g_t and consequently $\gamma_s(y)$ do not depend on household size s. Once again, the PIGLOG indirect utility function is assumed to represent individual preferences over goods[27]. Thereby, the SAT condition can be applied on the PIGLOG preferences if $b_t(p) = \bar{b_t}(\bar{p}/p_t)$ and $a_t(p) = \bar{a_t}(\tilde{p})$. Applying Roy's identity, we get the budget share function for each individual private assignable good, which have the following form:

$$w_t(y, p) = d_t(p) + \beta_t(\bar{p}/p_t)\ln y \tag{12}$$

where $\beta_t(\bar{p}/p_t)$ is the negative of own-price elasticity of $\bar{b_t}(\bar{p}/p_t)$. In turn $d_t(p)$ is a function of $\bar{a_t}(\tilde{p})$ and $\bar{b_t}(\bar{p}/p_t)$. Substituting the budget share function into equation (3) yield:

$$\begin{aligned} W_{cs}\,(y) &= s\eta_{cs}(\delta_{cs} + \beta_c\ \ln\ \eta_{cs}) + s\eta_{cs}\,\beta_c \ln\ y \\ W_{ms}\,(y) &= \eta_{ms}(\delta_{ms} + \beta_m\ \ln\ \eta_{ms}) + \eta_{ms}\,\beta_m \ln\ y \\ W_{fs}\,(y) &= \eta_{fs}(\delta_{fs} + \beta_f\ \ln\ \eta_{fs}) + \eta_{fs}\,\beta_f \ln\ y \end{aligned} \tag{13}$$

where $\delta_{ts} = d_t(A_s', p)$ and $\beta = \beta_t(\bar{p}/p_t)$. Again, these Engel curves are linear in ln y. Therefore, using linear regression we can get the coefficients $\eta_{ts}\beta_t$, which vary across household size s for any person t. As mentioned above, we consider three household types, for which we obtain twelve equations from (11)[28]. We identify one set of three resource shares for each type of household, plus three β_t parameter. Finally, the SAT suggests that with more than three household sizes, the model is overidentified. Thus,

[26] According to Dunbar et al. (2013, pag.451): "*If SAT were applied to all price effects, rather than just the cross-price effects of non-private goods, so that* $w_t(y,p) = g_t\left(\frac{y}{G_t(p)}\right)$*, and if it were applied to all goods at all expenditure levels, then preferences would be homothetic, which is clearly undesirable*."

[27] See footnote 15 for the specific form of PIGLOG indirect utility functions.

[28] Three Engel curves for each household type and three sets of resource shares equal to one.

information of household of larger size can be used to improve the precision of the estimates.

3.2.3 Combining Restrictions

The SAP and SAT conditions can be used together to strengthen identification. The PIGLOG indirect utility functions when we combine the two restrictions take the form $V_t(p,y) = \bar{b_t}(\bar{p}/p_t)\tilde{b_t}(\tilde{p})[\ln y - \ln a_t(p)]$. Applying Roy's identity, the budget share function for each individual private assignable good have the following form:

$$w_t(y,p) = d_t(p) + \beta \ln y \tag{14}$$

where $d_t(p)$ can be any function. Household demand for private assignable good is given by:

$$\begin{aligned} W_{cs}\,(y) &= s\eta_{cs}(\delta_{cs} + \beta\ \ln\ \eta_{cs}) + s\eta_{cs}\,\beta\ \ln\ y \\ W_{ms}\,(y) &= \eta_{ms}(\delta_{ms} + \beta\ \ln\ \eta_{ms}) + \eta_{ms}\,\beta \ln\ y \\ W_{fs}\,(y) &= \eta_{fs}\big(\delta_{fs} + \beta\ \ln\ \eta_{fs}\big) + \eta_{fs}\,\beta \ln\ y \end{aligned} \tag{15}$$

for any household size s and for any type person c, m ,f. 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.

CHAPTER 4

EMPIRICAL APPROACH AND DATA

4.1 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:

$$\begin{aligned} W_{cs}\,(y) &= a + z_c + s\eta_{cs}(\delta_{cs} + \beta_{cs}\ \ln\ \eta_{cs}) + s\eta_{cs}\,\beta_{cs} \ln\ \mathrm{y} + \varepsilon_c \\ W_{ms}\,(y) &= a + z_m + \eta_{ms}(\delta_{ms} + \beta_{ms}\ \ln\ \eta_{ms}) + \eta_{ms}\,\beta_{ms} \ln\ \mathrm{y} + \varepsilon_m \\ W_{fs}\,(y) &= a + z_f + \eta_{fs}\big(\delta_{fs} + \beta_{fs}\ \ln\ \eta_{fs}\big) + \eta_{fs}\,\beta_{fs} \ln\ \mathrm{y} + \varepsilon_f \end{aligned} \qquad (16)$$

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 (16) 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 (16), we can observe how distribution of resources within household varies with these variables.

4.2 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[29]. 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

[29] The POF is based on a complex sampling plane. This implies that the research was developed based on simple random samples, stratified samples and samples by clusters (IBGE, 2010). Technical details of the sample design are given in the full report of sample (see IBGE, 2010)

composition[30]. 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) [31]. 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[32]. Third, we drop household with any missing or incomplete data on the age or education level of members. Fourth, we select households 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 and footwear, as well as obvious outlying observations[33]. Sixth, we do not allow for men to be inactive so that we do not have a corner solution issue for men[34]. 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[35,36]. In Table 1, we display this standard statistical information.

We use the sum of clothing and footwear 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

[30] We leave to future work an analysis of intra-household consumption inequality for the families that have a different composition that traditional family. See e.g. Calvi (2015) for a recent application of Dunbar et al. (2013)'s model, who performs an analysis of female poverty inside the household in India taking into account households with a different composition of traditional family.

[31] The reason to exclude children over 14 years lies mainly in the fact that we have to separately identify expenditure on children's clothing and footwear from adult's clothing and footwear. The POF 2008-2009 considered household expenditure on clothing and footwear for children for all purchase or rental for individuals up to 14 years (IBGE, 2010).

[32] 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.

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

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

[35] 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.

[36] 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.

separately[37]. 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 A1 in the appendix presents descriptions of variables that we use in this research.

[37] 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. For variables that represent expenditure on footwear, in turn, we used Table 38. See Appendix B for details of the items used in the construction of these variables.

CHAPTER 5

EMPIRICAL RESULTS AND DISCUSSION

5.1 A first overview at the data

We begin this section by providing some basic descriptive statistics that allow us to characterize our sample. Table 1 show this information, which is stratified by household type[38]. 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[39]. 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 composition changes. We focus first on the expenditure on clothing and later we analyze of behavior on footwear expenditure. 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

[38] As was highlighted in previous section, types of households can be differentiated by the number of children in the household.

[39] 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.

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. Surprisingly, the budget share destined on footwear by women is smaller than devote by men[40]. However, as expected, as the size of family increases these share decreases for adult members. Another important finding in this preliminary inspection of the data concerns the fact that the budget share on private assignable goods 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'.

[40] We suspect that measurement errors in this variable may be associated with these results. However, we do not rule it out in our analysis.

Table 1. 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	Couples with Two Children	Couples with 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 and Footwear	0.167	0.185	0.157	0.156	0.169
Women Assignable Clothing and Footwear	0.113	0.127	0.108	0.101	0.106
Children Assignable Clothing and Footwear	0.175		0.175	0.174	0.177
Men Assignable Only Clothing	0.015	0.016	0.015	0.014	0.014
Women Assignable Only Clothing	0.018	0.019	0.019	0.016	0.017
Children Assignable Only Clothing	0.016		0.014	0.017	0.018
Men Assignable Only Footwear	0.152	0.169	0.142	0.141	0.155
Women Assignable Only Footwear	0.095	0.108	0.088	0.085	0.089
Children Assignable Only Footwear	0.159		0.161	0.157	0.159
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

5.2 Estimation Results

In this section, we show the results of our structural model. We begin presenting the parameters estimated in the equation (16) for each household member by family size. Then, we use these estimated parameters to predict the resource shares. Tables 2 to 4 present the estimated coefficients and their standard errors for the specification (16) 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 2. 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 4.7, 7.6 and 5.3 percentage points for childless couples, couples with one and two 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 1%, while are significant at level of 5% for couples with two and three children. Finally, note that demographics characteristics do not appear to have significant effects over the men's resource share, except for urban dummy that present a positive association for all the family structures considered here.

Table 2. Estimated Parameters associated to Men's Resource Shares

Household Type	Childless Couple	Couples with		
		One Child	Two Children	Three Children
Central-West	0.135	0.0788	-0.0164	0.752
	(0.0854)	(0.174)	(0.309)	(0.245)
South	0.157	-0.268	-0.487	0.478
	(0.0793)	(0.212)	(0.472)	(0.342)
Northeast	0.0644	0.150	0.253	0.891
	(0.0735)	(0.124)	(0.235)	(0.413)
North	0.296	0.0494	0.231	0.684
	(0.133)	(0.174)	(0.362)	(0.351)
Urban	0.207**	0.040**	0.040***	0.290***
	(0.132)	(0.199)	(0.194)	(0.249)
Man Education (Deviation of Mode)	0.047***	0.0767**	0.0534**	-0.0157
	(0.0545)	(0.0572)	(0.0495)	(0.0954)
Woman Education (Deviation of Mode)	-0.0102*	-0.118*	-0.0631**	-0.0648
	(0.0148)	(0.0588)	(0.0404)	(0.111)
Man Age (Deviation of Mean)	-0.0131*	-0.00254	-0.0270*	-0.00577
	(0.00388)	(0.0115)	(0.00972)	(0.0222)
Woman Age (Deviation of Mean)	0.000430	-0.0191*	-0.0301*	0.0176
	(0.00439)	(0.0101)	(0.0137)	(0.0234)
Men White	0.0126	0.149	0.420***	0.215
	(0.166)	(0.138)	(0.225)	(0.336)
Woman White	0.120	0.540	0.370	0.226
	(0.0957)	(0.183)	(0.190)	(0.290)
House owner	0.0578	-0.0668	0.0227	-0.0532
	(0.114)	(0.0837)	(0.186)	(0.198)
Woman Participation	-0.154***	-0.286***	-0.173*	-0.073*
	(0.0594)	(0.106)	(0.155)	(0.167)
Children Participation		-2.001	-0.973	-0.819
		(0.646)	(0.132)	(0.199)
Female Proportion		0.334	0.241	0.286
		(0.116)	(0.283)	(0.427)
Children Age (Deviation of Mean)		0.0597	0.121	0.0612
		(0.0111)	(0.0220)	(0.0265)
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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

Table 3 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[41]. 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 found if the woman participates in the labor market, but is only statistically significant for couples without and with a child. 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.

Contrary to what was found in the men's equation, dummies variables of regions play an important role in women's resource shares. Specifically, women that live in Northeast region have a negative impact on her resource shares in all household types, except in household with three children where the impact is positive. The same cannot be said for women residing in the South region, where we found a positive effect, but only in households without and with one child. Other positive and significant effect is observed if the women live in a household located in urban area.

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 1.5 and 3.5 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.

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

Table 3. Estimated Parameters associated to Women's Resource Shares

Household Type	Childless Couple	Couples with		
		One Child	Two Children	Three Children
Central-West	0.132	0.0527	0.00549	0.745
	(0.0853)	(0.165)	(0.300)	(0.254)
South	0.155***	0.268*	-0.486	0.392
	(0.0786)	(0.202)	(0.463)	(0.338)
Northeast	-0.0782**	-0.0116**	-0.0261**	0.0799*
	(0.0716)	(0.143)	(0.220)	(0.410)
North	-0.289***	0.0761	0.222	0.681
	(0.129)	(0.214)	(0.348)	(0.329)
Urban	0.020**	0.043***	0.072***	0.027**
	(0.130)	(0.190)	(0.180)	(0.257)
Man Education (Deviation of Mode)	-0.0457**	-0.0695**	-0.0532	-0.0165
	(0.0533)	(0.0558)	(0.0483)	(0.0966)
Woman Education (Deviation of Mode)	0.0641**	0.120***	0.0445*	-0.0663
	(0.0148)	(0.0552)	(0.0371)	(0.103)
Man Age (Deviation of Mean)	-0.0118***	-0.00471	-0.0240***	-0.00959
	(0.00388)	(0.0103)	(0.00885)	(0.0220)
Woman Age (Deviation of Mean)	-0.00149	-0.015***	-0.0351***	0.0165
	(0.00440)	(0.00890)	(0.0108)	(0.0223)
Men White	-0.00679	0.163	0.394***	0.235
	(0.156)	(0.140)	(0.204)	(0.333)
Woman White	0.126*	0.467***	0.349***	0.278
	(0.0941)	(0.176)	(0.161)	(0.274)
House owner	0.0663	-0.0978	0.0148	-0.0820
	(0.118)	(0.0828)	(0.176)	(0.213)
Woman Participation	0.134***	0.285***	0.151	0.0906
	(0.0545)	(0.106)	(0.151)	(0.168)
Children Participation		-2.080	-0.540	-0.840
		(0.639)	(0.765)	(0.386)
Female Proportion		0.012	0.184	0.030
		(0.112)	(0.269)	(0.386)
Children Age (Deviation of Mean)		0.057***	0.011***	0.070***
		(0.0108)	(0.0201)	(0.0246)
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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

The results reported in Table 4 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 0.0134 for couples with one child while it amounts to 0.017 and 0.018 for couples with two and three children, respectively. The estimated coefficient are statistically significant for all household type al level of 1%. 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 6.7% (8,0%) for couples with one child and 4.6% (5,6%) 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. 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.

Table 4. Estimated Parameters associated to Children's Resource Shares

Household Type	Couples with		
	One Child	Two Children	Three Children
Central-West	0.0682	-0.0407	0.572
	(0.162)	(0.313)	(0.253)
South	-0.215	-0.515	0.365
	(0.190)	(0.469)	(0.362)
Northeast	-0.180**	-0.199**	-0.174***
	(0.124)	(0.228)	(0.392)
North	-0.144	0.190	0.463*
	(0.165)	(0.336)	(0.325)
Urban	0.061**	0.014**	0.024**
	(0.182)	(0.190)	(0.247)
Man Education (Deviation of Mode)	0.0672*	0.0467*	0.0441
	(0.0513)	(0.0473)	(0.0950)
Woman Education (Deviation of Mode)	0.0802**	0.0566*	0.0986
	(0.0548)	(0.0398)	(0.108)
Man Age (Deviation of Mean)	-0.00373	-0.0262	-0.00254
	(0.0113)	(0.00879)	(0.0213)
Woman Age (Deviation of Mean)	-0.0171	-0.0369	0.0246
	(0.00962)	(0.0113)	(0.0218)
Men White	0.150*	0.398***	0.285
	(0.134)	(0.224)	(0.331)
Woman White	0.521***	0.392***	0.135
	(0.195)	(0.173)	(0.280)
House owner	-0.0414	0.00466	-0.0843
	(0.0802)	(0.183)	(0.221)
Woman Participation	0.28	0.186	0.0417
	(0.106)	(0.153)	(0.168)
Children Participation	0.527	0.355	-0.659
	(0.634)	(0.182)	(0.167)
Female Proportion	0.320	0.182	0.358
	(0.110)	(0.286)	(0.420)
Children Age (Deviation of Mean)	0.0134***	0.127***	0.0188***
	(0.0112)	(0.0238)	(0.0258)
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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

5.3 Estimates of Resource Shares

For a deeper understanding of the intra-household allocation process, we take the estimated parameters presented in Tables 2 to 4 and we use them to predict the resource shares of each household member by type of family, the main object of this study. Table 5 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 the most family types analyzed, except for couples without children. In particular, in column (1) is observed that men absorb on average a 65 per cent of household resources in childless couples. Consequently, women's resources are only, on average, 54 per cent of the men's resources (the remaining 35 per cent of total family resources)[42]. 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 42 per cent, but decreases as the number of children increases. Thus, we find that this shares standing to 38 per cent for couples with two children, while is around 37 per cent for couples with three children. These results are in line with find by Azimi (2015) that use data from Iranian families, especially in their estimates made for urban households, where men absorb a greater proportion of household resources than women does.

On the other hand, women's resource shares are estimated to be 22; 23 and 27,4 per cent for couples with one, two and three children, respectively. This result is surprising for us. It does not seem reasonable to accept that in household with only one child, the child receives a greater proportion of resources than the mother does. Previous studies have found that the proportion of household resources allocated to children increases as the size of the home increases. However, our findings do not follow this direction. In particular, we find that in couples with two children, the children absorb 38.3 per cent, while that in families with three children their receive 35.8 per cent. Possible errors of measurement in the budget shares of each member of the household could induce this result. However, we have no evidence to confirm this assumption.

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

Table 5. Estimates of Resource Shares by Household Size (Including Clothing and Footwear Budget Shares)

	Childless Couples		Couples with One Child		Couples with Two Children		Couples with Three Children	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Men's Resource Shares	.654	.2469	.429	.0582	.383	.0721	.368	.1199
Women's Resource Shares	.346	.0487	.226	.0655	.234	.0440	.274	.0901
Children's Resource Shares			.345	.0887	.383	.0767	.358	.0893
Each Children			.345	.0887	.191	.07674	.119	.0893

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.

5.3.1 Estimates of Resource Shares using Clothing and Footwear Budget Shares Separately

In the immediately preceding section, we have shown the estimated parameters of our model and we had used these estimations to recover the resource shares of each Brazilian household member by family type. These estimates are made using the sum of the expenditures on clothing and footwear of each type of individual within the household as a private assignable good. Some results in our view are not entirely convincing, especially the resource shares for women and children presented in Table 5. We suspect of measurement errors, particularly in the footwear data[43].To go a little further, we estimate the resources shares using clothing and footwear as private assignable good separately. Table 6 present the resource shares when we use footwear, while in the Table 7 when we use clothing[44]. Table 6 shows when we only use footwear expenditure as a private assignable good. These results are very similar obtained previously. As expected, men seems absorb a larger share of household resources than the rest of the household members. However, again we find that in households with a child, women receive less resources than the child, which it does not reasonable. This result is opposite to those found by Bargain et al. (2014), Azimi (2015) and Iglesias (2016), who find that mothers receive a higher proportion than their child does. Thus, this result gives us further evidence in favor of our suspicions of possible errors of measurement in the budget shares of footwear could induce to this inconsistency.

[43] See table 1 and footnote 39.
[44] These estimated parameters when we use footwear expenditure are reported in Tables A2, A3 and A4 in the appendix for men, women and children's equation, respectively, while in Tables A5, A6 and A7 when we use clothing.

Table 6. Estimates of Resource Shares by Household Size (Including Only Footwear Budget Shares)

	Childless Couples		Couples with One Child		Couples with Two Children		Couples with Three Children	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviations
Men's Resource Shares	.568	.2712	.432	.0559	.387	.1676	.366	.3030
Women's Resource Shares	.432	.0530	.229	.0573	.286	.1539	.324	.2310
Children's Resource Shares			.339	.0861	.327	.0420	.310	.1022
Each child			.339	.0861	.163	.0420	.103	.1022

Source: Research results
Notes: Private assignable good used in this estimation is only the footwear expenditure.
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.

Table 7. Estimates of Resource Shares by Household Size (Including Only Clothing Budget Shares)

	Childless Couples		Couples with One Child		Couples with Two Children		Couples with 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
Notes: Private assignable good used in this estimation is only the clothing expenditure.
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.

In Table 7 we report the resource shares when we only use clothing expenditure as a private assignable good. To begin with, we focus on childless couples. In these types of family structure, women receive about 46.8 per cent of total family resources, while men absorb the 53.2 per cent remaining. For one-child families, men, women and child receive 41, 40.6 and 23.4 percentage points, respectively. Unlike results on Tables 5 and 6, these resource shares appear to be more reasonable, strengthening our suspicious on the footwear data. In fact, 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. Further, we highlight that in two-child families the resource shares allocated to men,

women, and children are 37.5, 34.6 and 27.9 percentage points, respectively. Finally, the last column in the Table 7 reports the resource allocation among three-child families. Resources allocated to men, women and children are 35.6%, 33.5% and 30.9%, respectively. Again, these results appear to be more reasonable as they show the expected pattern of the proportion of household resources allocated to children increasing as the size of the home increases.

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[45]. 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 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[46].

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

[45] This result does not necessarily imply inequality in welfare terms, and it should be understood as inequality in the distribution of resources.
[46] Interpretation for the results presented in Table 6 that refer to resource shares when we only use expenditure on footwear can be done in an analogous way.

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 found 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.

Finally, in our preliminary data view, we have seen that the fraction of total expenditure on clothing is relatively higher for women compared to the fraction spent by their male partners. However, the estimated resource shares in our model reflect the opposite. In particular, we find that the Brazilian families allocate more resources toward men than women does. Therefore, the relative magnitude of assignable clothing budget share does not determine the relative magnitude of resource shares.

5.4 Heterogeneity across Regions

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.

Tables 8 to 10 present the results of the specification (16) separately by each region[47]. Several findings catch our attention. First, unlike our previous estimates, women's education seems to be positively related with men's resources shares, at least for Southeast, South and Northeast regions. Similar results are found by Bargain et al. (2014). Again, as in our previous estimates, the coefficients of proportion of female within the household in these estimations are insignificant, providing us with no evidence over our hypothesis of gender bias. The estimates also suggest that in South, Central-West and Northeast regions an increase in the mean of children's age tends to increase the children's share of resources. In other words, the older the children, the greater are their ability to extract resources from the home.

Furthermore, it is interesting to note that in Northeast and Southeast region the children's participation in labor market seems to affect the intra-household allocation of resources. In fact, an increase in the children's work participation entails a shift of the distribution of total expenditure from their parents to them. In this regard, in Brazil the federal government established since 1996 the Child Labor Eradication Program (Programa de Erradicação do Trabalho Infantil or PETI, for its acronym in Portuguese) with the aim of freeing children from child labor through a direct transfer of income to families. Although not the focus in our study, our research opens the debate to future researches in this question. Future research could seek answers to questions such as: what would be the amount of an ideal transfer to make a family indifferent for your child to work or not?

[47] Due to limitations in the number of observations in the sample, these estimates consider all households with children. We do not provide these estimates separately by type of household.

Table 8. Estimates of Parameters associated to Men's Resources Shares, by Region

Region	Southeast	Central-West	South	Northeast	North
Man Education (Deviation of Mode)	0.00412	0.0245*	0.046**	-0.0139	-0.00285
	(0.0140)	(0.0183)	(0.0285)	(0.0157)	(0.0294)
Woman Education (Deviation of Mode)	0.0269***	0.00889	0.0365*	0.0269***	-0.00632
	(0.0123)	(0.0160)	(0.0255)	(0.0147)	(0.0269)
Man Age (Deviation of Mean)	-0.00117	-0.00120	-0.00150	-0.0035***	0.00253
	(0.00209)	(0.00276)	(0.00321)	(0.00195)	(0.00372)
Woman Age (Deviation of Mean)	-0.00105	-0.00240	0.00238	0.000187	-0.00206
	(0.00252)	(0.00335)	(0.00363)	(0.00250)	(0.00544)
Men White	-0.0220	0.0255	0.0289	-0.0473**	-0.0503
	(0.0286)	(0.0370)	(0.0529)	(0.0311)	(0.0618)
Woman White	0.0386	0.0202	-0.0746*	0.00267	0.0690
	(0.0306)	(0.0390)	(0.0571)	(0.0286)	(0.0616)
House owner	0.0297	0.0536	0.0315	-0.0170	0.0369
	(0.0256)	(0.0486)	(0.0413)	(0.0295)	(0.0563)
Woman Participation	0.0207	0.0442	-0.00924	-0.00850	0.0473
	(0.0281)	(0.0397)	(0.0404)	(0.0287)	(0.0524)
Children Participation	-0.175***	0.192	-0.239	-0.493***	0.324
	(0.0825)	(0.219)	(0.246)	(0.214)	(0.264)
Female Proportion	0.0399**	0.00390	-0.0297	0.0167	0.0768
	(0.0266)	(0.0383)	(0.0423)	(0.0363)	(0.0624)
Children Age (Deviation of Mean)	0.00790	0.00792	0.00366	0.00749	-0.00402
	(0.00350)	(0.00486)	(0.00611)	(0.00493)	(0.00794)
Urban	0.00584**	0.0271**	0.0736**	0.0455*	-0.0581
	(0.0295)	(0.0419)	(0.0470)	(0.0338)	(0.0621)
Sample size	1727	1084	892	2176	918

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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.

Table 9. Estimates of Parameters associated to Women's Resources Shares, by Region

Region	Southeast	Central-West	South	Northeast	North
Man Education (Deviation of Mode)	0.00467	-0.0306**	-0.039**	-0.00146	-0.0147
	(0.0145)	(0.0195)	(0.0272)	(0.0164)	(0.0321)
Woman Education (Deviation of Mode)	0.0200**	0.00537	0.0379**	0.0246**	-0.0163
	(0.0128)	(0.0168)	(0.0237)	(0.0162)	(0.0302)
Man Age (Deviation of Mean)	-0.000186	-0.00124	-0.00248	-0.00117	0.00541
	(0.00206)	(0.00296)	(0.00303)	(0.00210)	(0.00428)
Woman Age (Deviation of Mean)	0.000121	-0.00336	0.00201	-0.00172	-0.00684
	(0.00254)	(0.00369)	(0.00347)	(0.00251)	(0.00594)
Men White	-0.0324	0.0155	0.0486	-0.0242	-0.0575
	(0.0295)	(0.0366)	(0.0525)	(0.0322)	(0.0711)
Woman White	0.0431*	0.0370	-0.0795*	-0.0144	0.0939*
	(0.0311)	(0.0394)	(0.0569)	(0.0295)	(0.0671)
House owner	0.0340*	0.00149	0.0240	-0.0255	0.0114
	(0.0259)	(0.0375)	(0.0416)	(0.0302)	(0.0561)
Woman Participation	0.0423*	0.0254	0.00586	-0.00242	0.0320
	(0.0297)	(0.0406)	(0.0393)	(0.0295)	(0.0554)
Children Participation	-0.191***	0.222	-0.276	-0.515***	0.236
	(0.0894)	(0.229)	(0.247)	(0.206)	(0.327)
Female Proportion	-0.0274	0.00180	-0.0102	0.0362	0.0977
	(0.0278)	(0.0404)	(0.0427)	(0.0385)	(0.0653)
Children Age (Deviation of Mean)	0.00563**	0.00607	0.00470	0.00719**	-0.00338
	(0.00358)	(0.00515)	(0.00588)	(0.00495)	(0.00888)
Urban	0.0543**	0.0392**	0.0638*	0.0283**	-0.0571
	(0.0288)	(0.0443)	(0.0462)	(0.0345)	(0.0657)
Sample size	1727	1084	892	2176	918

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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.

Table 10. Estimates of Parameters associated to Children's Resources Shares, by Region

Region	Southeast	Central-West	South	Northeast	North
Man Education (Deviation of Mode)	-0.00697	-0.0208	-0.047***	-0.0126	0.00342
	(0.0153)	(0.0183)	(0.0287)	(0.0162)	(0.0298)
Woman Education (Deviation of Mode)	0.0313***	0.00588	0.0231	0.0347***	-0.0122
	(0.0127)	(0.0161)	(0.0253)	(0.0156)	(0.0260)
Man Age (Deviation of Mean)	-0.00220	-0.00172	-0.00131	-0.0032**	0.00154
	(0.00210)	(0.00279)	(0.00326)	(0.00201)	(0.00411)
Woman Age (Deviation of Mean)	-0.00203	-0.00400	0.00243	-0.00275	-0.00338
	(0.00270)	(0.00328)	(0.00358)	(0.00255)	(0.00525)
Men White	-0.0217	0.0140	0.0441	-0.0642	-0.0472
	(0.0303)	(0.0360)	(0.0558)	(0.0327)	(0.0626)
Woman White	0.0254	0.0272	-0.0653	-0.0113	0.0910*
	(0.0319)	(0.0387)	(0.0615)	(0.0302)	(0.0653)
House owner	0.0350*	-0.0138	0.0187	-0.00970	0.0635
	(0.0269)	(0.0348)	(0.0438)	(0.0309)	(0.0556)
Woman Participation	0.0438*	0.0658**	-0.000051	-0.0388*	0.0517
	(0.0309)	(0.0408)	(0.0418)	(0.0297)	(0.0540)
Children Participation	0.203***	0.193	-0.184	0.401***	0.194
	(0.0789)	(0.243)	(0.228)	(0.190)	(0.294)
Female Proportion	-0.0429	-0.000425	-0.0209	0.0588	0.0640
	(0.0285)	(0.0376)	(0.0442)	(0.0383)	(0.0634)
Children Age (Deviation of Mean)	0.00938***	0.00745**	0.00402	0.00755**	-0.00245
	(0.00379)	(0.00468)	(0.00630)	(0.00496)	(0.00824)
Urban	-0.0197	-0.0219	0.0719**	0.0170	-0.0672
	(0.0307)	(0.0417)	(0.0476)	(0.0336)	(0.0610)
Sample size	1727	1084	892	2176	918

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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.

In Table 11, the estimated resources shares from estimated parameters shown in Table 8-10 are presented. 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 appears to be egalitarian, children continue to be disadvantaged, because on average each child absorbs only about 11 per cent of family resources[48]. Contrary to expectations, similar results are found 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 11. 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
Notes: Private assignable good used in this estimation is only the clothing expenditure.
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

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

CHAPTER 6

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. Future researches could consider families with a different composition that traditional family.

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. Another important finding is related to resource shares for children, which rise with the number of children but tend to decrease per child. We show that the resource shares of children represent about 23.4% of the total resources for one-child families and approximately 27.9% and 30.9% for families conformed by two and three children, respectively[49].

Several variables are explanatory of intra-household allocation of resources. On the one hand, woman's participation in the labor market seems to influence positively her share of total family resources. That is, women who work tend to extract more household resources compared to those who do not work. Regarding schooling decisions, we find that adults' education level seems to be associated to a larger fraction in the total expenditure, but negatively related with resources of her or his partner. This

[49] We clarify that these information correspond to the estimates made only using expenditure on clothing as a private assignable good. We have considered that this is our favorite estimates due to our suspicions of serious errors of measures in the budget share of footwear.

result can be explained by the gain in bargaining power within the household. The share of total expenditure devoted to children, in turn, is a positive and significantly related with the education of their parents, at least for household with one and two children. This effect is slightly larger when their mothers have the control of a larger fraction of the family resources. This result suggest that maternal education could be an important factor in the formulation of policies on reduction of child inequality.

On the other hand, our finding suggest that demographics variables seems to be less important in the distribution of resources among household members. Particularly, we only conclude that women and children's resource shares are impacted negatively if the family reside in Northeast region. The result is positive if the household is located in the urban area. In addition, this research does fail to detect gender bias in the intra-household allocation among children.

To go deeper into the details, we perform an analysis across regions with the aim of capturing possible heterogeneities. Again, our results reveal the existence of inequality in the allocation of resources inside the household. Families located in Southeast and Northeast regions seems to distribute their resources more equally among their members, about 33 per cent for each type of individual in the household. However, as we have highlighted this distribution considerably harms children, who receive about 11 per cent of the family resource. The situation of children is even more worrying when we analyze the North region, where the children only received near of 22 per cent of total resource (which is equivalent to 7% per child)

In general, the results presented in this research are in line with intra-household resource allocation literature. Furthermore, our results are directly comparable with the results of Iglesias (2016) who study individual poverty for Brazilian case. In fact, our estimated resources shares, when we use only expenditure on clothing as private assignable good, are very similar with estimates by Iglesias (2016) using a slightly different methodology. Therefore, our research contributes to the existing literature of collective models by applying a different empirical methodology in the Brazilian context, which are relatively rare in developing countries.

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 take 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 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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APPENDIX A

Table A1. 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 and footwear
Women private good	Sum of total household expenditure on women's clothing and footwear
Children private good	Sum of total household expenditure on children's clothing and footwear

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

Table A2. Estimates of Parameters associated to Men's Resources Share (Footwear Expenditure)

Household Type	Childless Couple	Couples with		
		One Child	Two Children	Three Children
Central-West	0.139	0.104	-0.0978	0.701
	(0.0694)	(0.155)	(0.278)	(0.299)
South	0.166	-0.227	-0.442	0.708
	(0.0718)	(0.192)	(0.508)	(0.299)
Northeast	-0.0173	-0.0715	0.240	0.431
	(0.0978)	(0.113)	(0.209)	(0.382)
North	-0.291	-0.00744	0.196	0.112
	(0.112)	(0.147)	(0.355)	(0.247)
Urban	0.036***	0.040**	0.019*	0.085*
	(0.130)	(0.193)	(0.193)	(0.219)
Man Education (Deviation of Mode)	0.045***	0.0451	0.0585*	0.033***
	(0.0454)	(0.0713)	(0.0456)	(0.150)
Woman Education (Deviation of Mode)	0.00804	-0.125***	-0.0547*	0.014*
	(0.0238)	(0.0540)	(0.0406)	(0.107)
Man Age (Deviation of Mean)	0.0243	0.00330	-0.0287	-0.0150
	(0.00544)	(0.0137)	(0.00971)	(0.0199)
Woman Age (Deviation of Mean)	0.0170	-0.019	-0.0336	0.0216
	(0.00562)	(0.00970)	(0.0136)	(0.0246)
Men White	-0.0187	0.0784	0.396***	0.331*
	(0.0992)	(0.155)	(0.224)	(0.249)
Woman White	0.256	0.547	0.354	0.134
	(0.0888)	(0.178)	(0.163)	(0.234)
House owner	0.0344	-0.0822	0.0327	0.227
	(0.0939)	(0.103)	(0.168)	(0.247)
Woman Participation	-0.130***	-0.284*	0.0593	0.231
	(0.0742)	(0.103)	(0.158)	(0.216)
Children Participation		-1.796	-0.462	-1.194
		(0.726)	(0.058)	(0.178)
Female Proportion		0.351	0.275	0.372
		(0.0997)	(0.275)	(0.397)
Children Age (Deviation of Mean)		0.0537	0.125	0.124
		(0.0113)	(0.0212)	(0.0398)
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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

Table A3. Estimates of Parameters associated to Women's Resources Share (Footwear Expenditure)

Household Type	Childless Couple	Couples with		
		One Child	Two Children	Three Children
Central-West	0.134*	0.0855	-0.0731	0.681
	(0.0644)	(0.148)	(0.277)	(0.326)
South	0.160*	-0.227	-0.451	0.705
	(0.0729)	(0.184)	(0.506)	(0.310)
Northeast	0.00147	-0.0153	0.220	0.384
	(0.0974)	(0.127)	(0.211)	(0.403)
North	-0.280**	-0.0170	0.162	0.0667
	(0.107)	(0.166)	(0.342)	(0.268)
Urban	0.035***	0.041***	0.010***	0.082***
	(0.129)	(0.189)	(0.179)	(0.225)
Man Education (Deviation of Mode)	-0.441***	0.0402	0.0501	0.313
	(0.0447)	(0.0683)	(0.0440)	(0.143)
Woman Education (Deviation of Mode)	0.00506	0.124***	0.0426**	0.145
	(0.0237)	(0.0528)	(0.0403)	(0.105)
Man Age (Deviation of Mean)	-0.0234***	0.00203	-0.0273***	-0.0164
	(0.00523)	(0.0122)	(0.00860)	(0.0205)
Woman Age (Deviation of Mean)	0.0163	-0.016***	-0.0348***	0.0200
	(0.00547)	(0.00860)	(0.0112)	(0.0242)
Men White	-0.0250	0.0815	0.364***	0.295
	(0.0956)	(0.151)	(0.204)	(0.249)
Woman White	0.251***	0.487***	0.347***	0.157
	(0.0867)	(0.164)	(0.145)	(0.231)
House owner	0.0368	-0.0915	0.0251	0.190
	(0.0922)	(0.100)	(0.164)	(0.251)
Woman Participation	0.121***	0.274***	0.0609	0.251
	(0.0728)	(0.106)	(0.157)	(0.210)
Children Participation		-1.841	-0.377	-1.621
		(0.723)	(0.913)	(0.012)
Female Proportion		0.328	0.233	0.362
		(0.0940)	(0.261)	(0.370)
Children Age (Deviation of Mean)		0.0496***	0.122***	0.122***
		(0.0112)	(0.0202)	(0.0389)
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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

Table A4. Estimates of Parameters associated to Children's Resource Shares (Footwear Expenditure)

Household Type	Couples with		
	One Child	Two Children	Three Children
Central-West	0.0987	-0.120	0.748
	(0.143)	(0.289)	(0.324)
South	-0.161	-0.451	0.793
	(0.174)	(0.498)	(0.329)
Northeast	-0.0952**	-0.191	0.420
	(0.117)	(0.207)	(0.397)
North	-0.0853	0.166	0.0787
	(0.142)	(0.332)	(0.271)
Urban	0.060***	0.011***	0.084***
	(0.174)	(0.197)	(0.236)
Man Education (Deviation of Mode)	0.0388**	0.0513	0.029***
	(0.0654)	(0.0438)	(0.150)
Woman Education (Deviation of Mode)	0.0902***	0.0554*	-0.116
	(0.0509)	(0.0404)	(0.103)
Man Age (Deviation of Mean)	0.00202	-0.0292***	-0.0222
	(0.0133)	(0.00859)	(0.0212)
Woman Age (Deviation of Mean)	0.0171***	0.0378***	0.0159
	(0.00927)	(0.0113)	(0.0239)
Men White	0.0644	0.377***	0.311
	(0.149)	(0.221)	(0.260)
Woman White	0.052**	0.038***	0.147
	(0.188)	(0.151)	(0.255)
House owner	-0.0567	0.00615	0.221
	(0.101)	(0.165)	(0.253)
Woman Participation	0.028***	0.0801*	0.291*
	(0.106)	(0.160)	(0.206)
Children Participation	-0.609	-0.824	-1.745
	(0.712)	(0.188)	(0.255)
Female Proportion	0.332***	0.242	0.180
	(0.0967)	(0.277)	(0.407)
Children Age (Deviation of Mean)	0.0495***	0.130***	0.150***
	(0.0113)	(0.0225)	(0.0404)
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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

Table A5. Estimates of Parameters associated to Men's Resource Shares (Clothing Expenditure)

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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

Table A6. Estimates of Parameters associated to Women's Resource Shares (Clothing Expenditure)

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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

Table A7. Estimates of Parameters associated to Children's Resource Shares (Clothing Expenditure)

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.
Private assignable good used in this estimation is the sum of clothing and footwear expenditure.
Southeast Brazil is the excluded region.

APPENDIX B

Table B1. Private assignable goods (Construction of expentiduture on clothing and footwear)

ACQUISITION AND RENTAL OF MEN'S CLOTHING		
TABLE	**ITEM CODE**	**PRODUCT**
34	00101	COAT (COAT, SWEATER, ETC.)
34	00102	SWEATER
34	00103	WOOL SWEATER
34	00104	JACKET
34	00105	PULLOVER
34	00106	SCARF
34	00107	COAT
34	00201	BERMUDA SHORTS, TRUNKS E SHORTS
34	00202	TRUNKS
34	00203	SHORTS
34	00204	BERMUDA SHORTS
34	00301	LONG PANTS
34	00401	BLOUSE OR SHIRT
34	00402	BLOUSE
34	00403	SHIRT
34	00404	SHORT SLEEVE SHIRT
34	00405	LONG SLEEVE SHIRT
34	00501	T-SHIRT
34	00601	SPORTS SET
34	00602	JOGGING
34	00603	TRAINING
34	00604	BIG COAT
34	00701	UNDERWEAR
34	00801	TIE
34	00901	BATHING SUIT
34	01001	OVERALLS
34	01002	DUNGAREES
34	01101	SOCKS
34	01201	PALETTE AND BLAZER
34	01202	BLAZER
34	01203	PALETTE
34	01301	PAJAMA AND ROBE
34	01302	ROBE
34	01303	ROBE
34	01304	BATHROBE
34	01305	PAJAMAS
34	01401	SUIT

34	01501	VEST
34	01601	CAP
34	01701	LEATHER GLOVES, MESH AND TISSUE
34	01702	LEATHER GLOVE
34	01703	LEATHER MESH
34	01704	LEATHER TISSUE
34	01801	RENTAL OF CLOTHING
34	01901	MILITARY UNIFORM
34	02001	OVERALL
34	02101	SLACK
34	02201	SHIRT (SPORTS UNIFORM)
34	02301	SHORTS (SPORTS UNIFORM)
34	02401	BIG SOCK (SPORTS UNIFORM)
34	02501	COSTUME
34	02601	MOTORCYCLE OVERALLS
34	02701	PANT AND SHIRT KIT
34	02801	SHORT AND SHIRT KIT
34	02901	SMOKING
34	03001	KIMONO
34	03002	UNIFORM OF JUDO (KIMONO)
34	03101	PANTS AND JACKET KIT
34	03201	WORK UNIFORM
34	03202	COAT
34	03301	BELTS
34	99901	AGGREGATED

ACQUISITION AND RENTAL OF WOMEN'S CLOTHING

TABLE	ITEM CODE	PRODUCT
35	00101	COAT (COAT, SWEATER, ETC.)
35	00102	COAT
35	00103	SWEATER
35	00104	PULLOVER
35	00105	SCARF
35	00106	JACKET
35	00107	SPECIAL SCARF
35	00108	COAT
35	00109	WOOL SWEATER
35	00110	SHAWL
35	00201	BERMUDA SHORTS E SHORTS
35	00202	SHORTS
35	00203	BERMUDA SHORTS
35	00301	BLOUSE OR SHIRT

35	00302	BLOUSE
35	00303	SHIRT
35	00304	SMOCK
35	00305	BABY LOOK
35	00306	BODY
35	00307	SHRUG
35	00401	LONG PANTS
35	00501	PANTIES
35	00601	COLLANT
35	00602	GYMNASTICS CLOTHING
35	00603	GYMNASTICS MESH
35	00604	BALLET UNIFORM
35	00701	SWEATSHIRT, PAJAMA, ROBE, ETC
35	00702	PAJAMA
35	00703	ROBE
35	00704	BATHROBE
35	00705	NIGHTDRESS
35	00706	BABY DOLL
35	00801	SPORTS SET
35	00802	JOGGING
35	00803	TRAINNING
35	00901	T-SHIRT
35	01001	OVERALL
35	01002	DUNGAREES
35	01101	SWIMWEAR
35	01102	BIKINI
35	01103	SWIMWEAR
35	01201	SOCK
35	01202	PANTYHOSE
35	01301	SKIRT
35	01401	DRESS
35	01501	MODELER
35	01601	LEATHER GLOVES, MESH AND TISSUE
35	01602	LEATHER GLOVE
35	01603	LEATHER MESH
35	01604	LEATHER TISSUE
35	01701	COMBINATION
35	01801	CAP
35	01901	CLOTHING RENTAL
35	02001	STRAP
35	02101	BEACH WRAP
35	02102	BEACH SARONG
35	02201	WOOL PONCHO
35	02301	PETTICOAT

35	02401	SLACK
35	02501	WEDDING DRESS
35	02601	SHIRT (SPORTS UNIFORM)
35	02701	SHORTS (SPORTS UNIFORM)
35	02801	BIG SOCK (SPORTS UNIFORM)
35	02901	COSTUME
35	03001	BUSTIER
35	03101	MOTORCYCLE OVERALLS
35	03201	LEGGINGS
35	03202	GAITER
35	03301	SKIRT AND BLOUSE KIT
35	03401	SHORT AND BLOUSE KIT
35	03501	BLAZER
35	03601	SHEET AND BLAZER KIT
35	03701	SUIT OR SUITCASE
35	03702	SUIT
35	03703	SUITCASE
35	03801	SMALL OVERALL
35	03802	SMALL OVERALL
35	03901	PANTS AND BLOUSE KIT
35	04001	BRASSIERE
35	04101	PLASTIC PANTS
35	04201	WORK UNIFORM
35	04202	COAT
35	04301	VEST
35	04401	PANTS AND JACKET KIT
35	04501	SKIRT AND JACKET KIT
35	04601	KIMONO
35	04701	TIE
35	04801	PANTS OF CAPOEIRA
35	04901	SKIRT PANTS
35	05001	TOP
35	05101	PANT (SPORT UNIFORM)
35	05201	SHORT AND BLOUSE KIT
35	05301	PANTS AND BLAZER KIT
35	05401	COAT AND BLOUSE KIT
35	05501	OVERALL
35	05601	MILITARY UNIFORM
35	05701	PANTIES AND BRASSIERE KIT
35	05801	PANTIES (EXCEPT PURCHASED)
35	05901	MESH KIT
35	99901	AGGREGATED

ACQUISITION AND RENTAL OF CHILDREN'S CLOTHING		
TABLE	**ITEM CODE**	**PRODUCT**
36	00101	COAT (COAT, SWEATER, ETC.)
36	00102	SWEATER
36	00103	JACKET
36	00104	PULLOVER
36	00105	SCARF
36	00106	COAT
36	00201	BERMUDA SHORTS AND SHORTS
36	00202	SHORTS
36	00203	BERMUDA SHORTS
36	00204	TRUNKS
36	00301	BLOUSE OR SHIRT
36	00302	SHIRT
36	00303	BLOUSE
36	00401	LONG PANTS
36	00501	SWIMWEAR
36	00502	SWIM TRUNKS
36	00503	SWIMWEAR
36	00504	BIKINI
36	00505	SWIMWEAR
36	00601	PANTIES
36	00701	GYMNASTICS CLOTHING
36	00702	COLLANT
36	00703	GYMNASTICS MESH
36	00801	SWEATSHIRT, PAJAMA, ROBE, ETC
36	00802	PAJAMA
36	00803	ROBE
36	00804	BATHROBE
36	00805	NIGHTDRESS
36	00806	BABY DOLL
36	00901	SPORTS SET
36	00902	JOGGING
36	00903	TRAINNING
36	00904	SET OF SWEATPANTS
36	01001	UNDERWEAR
36	01101	BRASSIERE
36	01201	DIAPER
36	01301	OVERALL
36	01302	DUNGAREES
36	01401	SOCK
36	01402	PANTYHOSE

36	01501	COAT, BLAZER AND SUIT
36	01502	BLAZER
36	01503	SUIT
36	01504	COAT
36	01601	SKIRT
36	01701	DRESS
36	01702	BRIDESMAID DRESS
36	01801	OTHER BABY CLOTHES
36	01802	PLASTIC PANTS
36	01803	SWADDLING CLOTHES
36	01804	BLANKET
36	01805	BELT
36	01806	BIB
36	01807	CALCA ENXUTA
36	01808	UMBIGUEIRO
36	01809	SHOES OF WOOL
36	01810	BABY FLANNEL
36	01811	BOTTON / PANT
36	01812	SET PAGAO
36	01813	LITTLE SET PAGAO
36	01814	CHANGE DIAPERS
36	01901	SHIRT
36	02001	PETTICOAT
36	02101	COMBINATION
36	02201	CAP
36	02301	BEACH WRAP
36	02401	LEATHER GLOVES, MESH AND TISSUE
36	02402	LEATHER GLOVE
36	02403	LEATHER MESH
36	02404	LEATHER TISSUE
36	02501	KIT SHORT AND SHIRT
36	02601	KIT SHORT AND BLOUSE
36	02701	RENTAL OF CLOTHING
36	02801	UNIFORM FOR CHOIR
36	02802	UNIFORM FOR CHURCH CHOIR
36	02803	GRADUATION GOWN
36	02804	SET FOR FIRST COMMUNION
36	02901	SHIRT (SPORTS UNIFORM)
36	03001	SHORTS (SPORTS UNIFORM)
36	03101	BIG SOCK (SPORTS UNIFORM)
36	03201	COSTUME
36	03301	BUSTIER
36	03401	SKIRT AND BLOUSE KIT
36	03501	PANTS AND SHIRT KIT

36	03601	KIMONO
36	03602	UNIFORM OF JUDO (KIMONO)
36	03701	PANTS AND JACKET KIT
36	03801	WOOL SWEATER
36	03901	LITTLE OVERALL
36	04001	TIE
36	04101	LEGGINGS
36	04102	GAITER
36	04201	VEST
36	04301	BALLET UNIFORM
36	04401	SLACK
36	04501	SKIRT AND JACKET KIT
36	04601	BABY ENXOVAL
36	04701	KIT PANTIES AND BRASSIERE
36	04801	PANTIES (EXCEPT PURCHASED)
36	99901	AGGREGATED

ACQUISITION AND RENTAL MEN'S FOOTWEAR

TABLE	ITEM CODE	PRODUCT
38	00701	MEN´S SANDAL (EXCEPT OF RUBBER OR PLASTIC)
38	01302	MEN'S BOOT (EXCEPT OF PLASTIC)
38	01303	MEN'S SHOES (EXCEPT OF PLASTIC)
38	01601	MEN'S TENNIS
38	02601	MEN'S ESPADRILLE
38	03202	MEN'S PLASTIC SHOE
38	03203	MEN'S PLASTIC SANDAL
38	04701	MEN´S RUBBER SANDAL

ACQUISITION AND RENTAL WOMEN'S FOOTWEAR

TABLE	ITEM CODE	PRODUCT
38	00801	WOMEN'S SANDAL (OTHER THAN RUBBER OR PLASTICS)
38	01102	WOMEN'S PLASTIC SHOE
38	01103	WOMEN'S PLASTIC SANDAL
38	01402	WOMEN'S BOOT (EXCEPT OF PLASTIC)
38	01403	WOMEN'S SHOES (EXCEPT OF PLASTIC)
38	02701	WOMEN'S ESPADRILLE
38	04901	WOMEN'S RUBBER SANDAL
38	06601	WOMEN'S TENNIS

ACQUISITION AND RENTAL CHILDREN'S FOOTWEAR		
TABLE	**ITEM CODE**	**PRODUCT**
38	00601	CHILDREN'S SANDAL (EXCEPT OF RUBBER OR PLASTIC)
38	00901	CHILDREN'S RUBBER SANDAL
38	01003	CHILDREN'S PLASTIC SANDAL
38	01002	CHILDREN'S PLASTIC SHOE
38	01202	CHILDREN'S BOOT(EXCEPT OF PLASTIC)
38	01203	CHILDREN'S SHOE (EXCEPT OF PLASTIC)
38	01501	CHILDREN'S TENNIS
38	02801	CHILDREN'S ESPADRILLE