ALVARO JOSÉ ALTAMIRANO MONTOYA

LIFE STANDARDS AND INTERGENERATIONAL TRANSMISSION OF EARNINGS: A comparative analysis among different family arrangements in Nicaragua

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

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BIOGRAPHY

Álvaro nasceu em Somoto, Nicarágua em 1987 e é um economista graduado pela Universidad Centroamericana (UCA), Managua, Nicarágua. Trabalhou durante 4 anos para a firma centro-americana de análise macroeconômica, Consultores para el Desarrollo Empresarial-Nicarágua (COPADES-Nicarágua). No mesmo período foi Professor de Economia Aplicada na UCA, e consultor de ministérios públicos e organismos civis e estatais da região centro-americana. Suas pesquisas se concentram nas falhas de mercado, o mercado de trabalho, as condições de vida, as relações de gênero e os processos de envelhecimento populacional.

SUMMARY

ABBREVIATIONS AND ACRONYMS

BNA	Basic Needs Approach
CEDLAS	Centro de Estudios Distributivos Laborales y Sociales
CIID	Canadian Intergenerational Income Data
CEPAL	Comisión Económica Para América Latina
CONEVAL	National Council for the Evaluation of Social Policy
DHS	Demographic and Health Survey
ECLAC	Economic Commission for Latin America and the Caribbean
EMNV	Encuesta Nacional de Hogares sobre Medición de Nivel de Vida
ENDESA	Encuesta Nicaragüense de Demografía y Salud
ESAF	Enhanced Structural Adjustment Facility
GSEP	German Socio-Economic Panel
GDP	Gross Domestic Product
HEI	Household Equivalent Income
HDI	Human Development Index
IEE	Intergenerational Earnings Elasticity
IMF	International Monetary Fund
INIDE	Instituto Nacional de Información de Desarrollo
IV2SLS	Instrumental Variables Two Stage Least Squares
MPI	Multidimensional Poverty Index
OECD	Organization for Economic Cooperation and Development
OPHI	Oxford Poverty and Human Development Initiative
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
PRGF	Poverty Reduction and Growth Facility
PSID	Michigan Panel Study of Income Dynamics
SMH	Single-Mother Households
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNFPA	United Nations Population Fund

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ABSTRACT

MONTOYA, Alvaro José Altamirano, M.Sc., Universidade Federal de Viçosa, March, 2015. **Life standards and intergenerational transmission of earnings: a comparative analysis among different family arrangements in Nicaragua.** Adviser: Karla Maria Damiano Teixeira.

In contrast with other societies, the single mother status is not a new pattern in Latin America, but rather a traditional configuration that reflects historical continuity. For Nicaragua, there is a notion of women being poorer and disadvantaged in relation to men, and thus transmitting their conditions upon their children. In that context, the main objective of this investigation is to analyze, comparatively, the socioeconomic conditions among single mother and biparental families. The research was divided in three articles: the first uses data from the most recent national household survey to compare different socioeconomic conditions among single-mother and biparental families; the second applies the Alkire-Foster (2011) multidimensional poverty methodology to breakdown poverty among those families, using Nicaragua's national Demographic and Health Survey (DHS 2011/2012) for that purpose; and finally, article 3 uses the last three national household surveys to understand the patterns of intergenerational earnings mobility, occupational characteristics and income inequality between both family groups. The results show that Nicaraguan households headed by single-mothers have similar socioeconomic conditions as families with both parents. On the other hand, we found that women are more likely to have fewer weakly working hours, which suggests they prioritize occupations that allows them more time allocation in house and child care. In contrast, income analysis revealed a narrowing gender wage gap over the past decade. Using analytical tools that take into account the different dimensions of poverty we found poverty dominance on male-led families over single-mother families and female-led biparental families. These conclusions reflect the resilience and audacity single mothers develop in face of challenges imposed by society. The way forward, though, will need to include men to share household responsibilities in all dimensions, in societies with less asymmetric gender relations and more mutually discussed decisions.

RESUMO

MONTOYA, Alvaro José Altamirano, M.Sc., Universidade Federal de Viçosa, março de 2015. **Life standards and intergenerational transmission of earnings: a comparative analysis among different family arrangements in Nicaragua.** Orientadora: Karla Maria Damiano Teixeira.

Em contraste com outras sociedades, o status de mãe solteira não é um novo padrão na América Latina, mas sim uma configuração tradicional que reflete continuidade histórica. Para a Nicarágua, pressupõe-se a noção das mulheres serem mais pobres e desfavorecidas em relação aos homens, e, assim, transmitirem as suas condições sobre os filhos. Nesse sentido, objetivou-se analisar, comparativamente, as condições socioeconômicas entre famílias de mães solteiras e famílias biparentais. A pesquisa foi dividida em três artigos: o primeiro utiliza dados da mais recente pesquisa domiciliar nacional para comparar diferentes condições socioeconômicas entre famílias de mães solteiras e famílias biparentais; no segundo artigo se aplica a metodologia de pobreza multidimensional de Alkire e Foster (2011) para decompor as dimensões da pobreza nessas famílias, usando a última Pesquisa Demográfica e de Saúde da Nicarágua (DHS 2011/2012); e, finalmente, o artigo 3 utiliza as três últimas pesquisas domiciliares nacionais para estudar os padrões de mobilidade económica intergeracional, as características ocupacionais e a desigualdade de renda entre os dois grupos familiares. Os resultados mostraram que as famílias nicaraguenses chefiadas por mulheres sós têm condições socioeconômicas semelhantes às famílias com ambos os pais. Por outro lado, verificou-se que as mulheres trabalham menos horas semanais que os homens, o que sugere que elas priorizam ocupações que lhes permitem uma maior alocação de tempo para o trabalho doméstico e o cuidado dos filhos. Em contraste, a análise de renda revelou uma redução no gap salarial de gênero ao longo da última década. Fazendo uso de instrumentos que levam em conta as diferentes dimensões da pobreza, foi encontrada uma predominância da pobreza nas famílias lideradas por homens, em relação às famílias de mães solteiras e as famílias biparentais lideradas por mulheres. Estas conclusões refletem a resiliência e audácia que as mães solteiras desenvolvem em face dos desafios impostos pela sociedade. O caminho a seguir, no entanto, terá de incluir os homens a partilhar responsabilidades domésticas em todas as dimensões, em sociedades com relações de gênero menos assimétricas e decisões mutuamente mais discutidas.

I. RESEARCH TOPIC AND APPROACH: A PRESENTATION

1.1 The issue and justification

Growing up in Nicaragua I noticed that, like my own, other mothers had to deal almost by themselves with child and house care. This phenomenon, I perceived, extended beyond my closest circle of social life. Nicaragua, being a poor country with important development constraints, is also the leading Latin-American country in early motherhood, associated with single parenthood.

Nicaraguan mainstream economic analysis focuses on the monetary and commercial stabilization strategies in a small and open economy, with fewer attention to microeconomic issues related to population subgroups bottlenecks. In this manner, an empirical comparison of economic dependence and inequality among different family arrangements arouse my curiosity and led to the deepening of the specific issue of the living conditions of single mother families.

If the separation between sexuality and reproduction, with the drop in fertility was one of the main drivers of family dynamics in the twentieth century, the rupture between marriage and reproduction, with the weakening of the parent-child ties, will be one of the pillars that will shape family arrangements during the twenty-first century. It is assumed that these changes in the family relational space can determine the distribution of family responsibilities and the coordination of family solidarity networks, the patterns of gender relations and the living conditions and well-being of children, women and men along the course of their life (QUILODRÁN; CASTRO MARTÍN, 2009).

The father's absence in the family setting is not an unusual phenomenon, being considered by some as a syndrome. Polaino-Lorente et al. (2003, p.62) refer to the absent father syndrome as "a set of emotional, cognitive, physical and spiritual deprivations that come upon children as a consequence of the vacuum that operates in paternal relations".

It is important to note that only a small percentage of single-parent families are represented by the single father figure. Furthermore, as stated by Meves (2006), it is in most cases, an apparent single parenthood, because children are entrusted to the father's companions, grandparents or other relatives.

The reason why there are disproportionally more single-mother than single-father families is predominantly one of socio-cultural discrimination, which is due to the fact that "in most societies the pressures on women to contain their sexuality within a stable partnership and/or to keep marriages afloat are greater than for men" (CHANT, 2007, p.27).

Divorce or separation can contribute to a family crisis, with the potential to generate social vulnerability at the time of rupture, especially for children. However, as described by Rodenberg (2004), in some cases, such as those in which the woman flees domestic violence, the decision to lead the family alone can represent an overall improvement and not a setback.

Moreover, although the dissemination of contraceptive methods may have significantly reduced the number of single-mother families, there are also those established for reasons of spouse/partner's abandonment or by the decision to raise their children on their own (ARONOVICH et al., 2009).

The most intuitive (simpler) economic assumption is that single-mother families would not only have a lower income, but also, by default, less professional contacts and therefore fewer opportunities to succeed in the labor market (NEWMAN; GRANOVETTER, 1996; CORRELL et al., 2007). It is expected for the magnitude of these asymmetric gender relations to be intensified in societies where nepotism and partisanship prevails over merit, as is often the case in Nicaragua[1]. One cannot fail to highlight the importance of a stable and predictable income, especially for poor families. Because for instance, if parents realize that in the long run they cannot fund children's education, the human capital investment decision would be avoided from the beginning (BANERJEE; DUFLO, 2007, 2012).

Similarly, it is worth mentioning that in the socio-cultural reproduction process, women's daily life plays a key role, because they structure, organize, and produce family dynamics. As stated by Massi, (1992, p.123), "it is she who makes the link between the private sphere with the social, that is, with the largest family, friends, school, etc.". Recognizing this fact, it is understood that single mothers, according to cultural norms, have to comply simultaneously with the dual function of workers in the labor market and in the domestic sphere with motherhood duties, as the care of home and children (BORDONAL; FORTUNA, 2011).

In a region where almost one third of pregnancies correspond to teenage women, Nicaragua leads early pregnancy (UNFPA, 2013), with potential risks of limiting poverty reduction strategies and nurturing income inequality.

[1] In 2014, Nicaragua was ranked number 133 in the Corruption Perceptions Index, according to the annual report published by Transparency International, which evaluated 175 countries worldwide.

The assumption of greater social risk in families headed by single women has support from international poverty studies. Based on more than 60 micro-level studies in Latin America, Africa and Asia, Buvinic and Gupta (1997) concluded that in two thirds of cases, families headed by women were poorer than those headed by men.

In other studies, such as Steinberg (2001) McLanahan (2004), Rich et al. (2007) it was shown that, when compared with adolescents from families with both parents, children and adolescents in families headed by single mothers reported receiving less nutritional care and less help with school and domestic work, as well as fewer assistance to prepare its school curriculum.

A study involving data from 16 Latin American countries shows that being born from single teenage mothers significantly reduces the likelihood of children, particularly from poor families, to complete high school (ALDAZ-CARROLL; MORÁN, 2001). This situation increases the risk of intergenerational transmission of poverty in these countries, once high school completion is taken as the threshold at which poor children reach a reasonably high probability of escaping poverty in the course of their life (MORÁN et al., 2003).

On the other hand, there are authors that question the notion of female-headed households as "the poorest of the poor" and defend some of the consequences of the female administration of family resources (GONZÁLEZ DE LA ROCHA, 2002; CHANT, 2007, 2008; BRADSHAW; QUIRÓS, 2008; BRADSHAW, 2009).

According to Chant (2007), those assumptions are promoted by conservative social movements that do not recognize the legitimacy of different family arrangements, other than those socially accepted as standard, arguing that "female household heads are often highly proactive (and successful) in overcoming discrimination as women and as lone parents (through, for example, the manipulation of household membership and earning strategies)" (2007, p.5).

However, that author acknowledges the impending social vulnerability of those families' environment, by observing that the State has not given them the necessary support. Accordingly, she also admits that, although the legal provisions relating to fatherlessness are in place in many family codes, there is no guarantee about pension implementation for wives and children, especially among the poor (CHANT, 2007).

1.2 Objectives

There is a debate between the actual socioeconomic conditions and the transmission of poverty in single-mother households. In that context, our research objective was to develop a comparative analysis of the living conditions between single mother and biparental families in Nicaragua. Specifically, we aim to contrast the differences among several socioeconomic indicators, breakdown the dimensions of poverty, and understand the patterns of economic mobility in both families.

1.3 Dissertation structure

Our study was divided in three articles:

- The first article took data from the most recent National Household Survey of Living Standard Measurement (EMNV 2009, for its acronym in Spanish) to compare different socioeconomic conditions among single-mother and biparental families;
- The second article applied the Alkire-Foster (2011) multidimensional poverty methodology to breakdown poverty among those families, using Nicaragua's National Demographic and Health Survey (ENDESA 2011/2012) for that purpose;
- Article 3 used EMNV 2001, 2005 and 2009 to understand the patterns of intergenerational earnings mobility and occupational characteristics between both family groups.

1.4 General methodological information

This section presents the main methodological procedures applied in our research. We first describe the databases used on each article, to then expand on the general approach of our three articles. Later on, we present a brief description of the universe, units and categories of analysis. Finally, the last part of this section shows the study's limits by explaining the changing nature of the family concept through time and space.

The research can be characterized as having an exploratory-descriptive nature, using cross-sectional data and panel data drawn from official (public) sources. We decided to work with cross-sectional databases to have national representation of the single-motherhood phenomenon, within a wider context of comparative poverty assessment.

1.4.1 Cross-sectional and panel data

In virtue of the importance of adequate statistical information to the decisions of public policy, the Government of Nicaragua periodically builds census and household survey

data, with important financial and technical contributions from international institutions as the World Bank and the Inter-American Development Bank. The two primary sources of information used in this study come from the National Institute of Development Information (INIDE, for its acronym in Spanish), which are: the Living Standard Measurement Study (LSMS) and the Demographic and Health Survey (DHS).

According to INIDE, both LSMS and DHS allow to obtain representative estimates at national level, for urban-rural areas, and for Nicaragua's seven macro regions[2]. To date, INIDE (former INEC) has developed five Living Standards Measurement Surveys corresponding to the years 1993, 1998, 2001, 2005 and 2009. As for Demographic and Health Surveys, the existing four correspond to the years 1998, 2001, 2006/07, and 2011/12. For all cross-sectional databases, extraction and analysis was developed with Stata® 12.

The first and third article employ Nicaragua's Living Standards Household Survey (EMNV) as their major informational source. According to INIDE (2011), the main objectives of the EMNV surveys are to collect information on consumption and income aggregates, basic services and general living standards conditions, in order to construct poverty measures and study the evolution of poverty through time. It is important to recall that, for different reasons explained further, Article one uses Nicaragua's 2009 EMNV, while Article 3 makes use of Nicaragua's last three EMNV's (2001, 2005, 2009).

EMNV 2001 was collected in 2001, from April 30st to August 22nd, summing up 22,810 people that integrated 4,191 households (INEC, 2003); Nicaragua's estimated total population for 2001 was of 5.1 million people. The second EMNV used in our research was collected in 2005, between July 11th and October 25th, interviewing a total of 36,612 people, belonging to 6,882 households (INIDE, 2007). The last EMNV was collected in 2009, between September 1st and November 7th, and its database was published in 2011 by INIDE in its web page[3]. The EMNV 2009 database consists of 7,520 households (30,432 people interviewed), for a total national population of 5.7 million people in that year.

The second article uses Nicaragua's 2011/2012 Demographic and Health Survey (ENDESA, for its Spanish acronym). According to INIDE, ENDESA's main objective is to "advance the process of restitution of the right to [good] health of the Nicaraguan population,

[2] Nicaragua's seven geographic macro-regions consist of Managua, Urban Pacific, Rural Pacific, Urban Center, Rural Center, Urban Atlantic and Rural Atlantic.
[3] http://www.inide.gob.ni/

by supporting institutions of government and other organizations for appropriate decision-making in the field of Demography and Reproductive Health" (INIDE, 2013, p.3).

ENDESA's 2011/2012 sample size comprised 21,960 households in the urban and rural areas of 15 Departments and two Autonomous Regions. Built with the international DHS methodology, Nicaragua's 2011/2012 ENDESA includes three questionnaires, one for basic services and housing conditions, other for women's reproductive health, and a third for men's reproductive health. The gathering of information was done in 12 months, with a first stage between June and December 2011, and a second stage between July and November 2012 (INIDE, 2013).

1.4.2 Analysis' universe and units

The place of study is Nicaragua, the biggest and poorest country in Central America, with a current population that totals 6 million people (THE WORLD BANK, 2014). Classified by economic literature as a 'small and open economy', Nicaragua's recent history is one of rapid political and economic changes (Bello, 2007).

Nicaragua has a territorial surface of 120,340 km^2, excluding 8,264 km^2 of Lake Nicaragua and 1,064 km^2 of Lake Xolotlán. Politically and administratively the country is divided into 15 departments, two autonomous regions; the North Atlantic Autonomous Region (RAAN) and the South Atlantic Autonomous Region (RAAS) and 153 municipalities. Historically, the country has been divided into three natural regions; Pacific region, North-Central and Atlantic Region (see Figure 1).

Figure 1: Nicaragua, political-administrative division map.
Source: Instituto Nicaraguense de Estudios Territoriales (INETER, 2011).

The empirical analysis unit is the family (or household)[4], as officially defined by each dataset. The number and structures of families varies with each database, but in overall terms, the sum of single-mother and biparental families account for more than 2/3 of all Nicaraguan families.

Our classification of 'single-mother' is a mother, family head, which self-declared herself as being single, separated or divorced. For the first two articles, and to define more clearly the population under study, only those households with underage children were chosen[5], as a proxy for economic dependence. In the final article, our samples include single-mother and biparental families with adult children only (restricted for offspring's age to range from 18 to 45 years old).

1.4.2 Statistical procedures

In regard to methods, each article makes use of different analytical tools and sample sets, all aimed at contrasting the living conditions of single-mother and biparental families, and specifically explained within each article.

[4] For all samples there were no important differences between the number of 'families' and 'households'. For that reason, both terms are used as synonyms.
[5] In Nicaragua, adulthood begins legally at 18, according to Article 299 of the Family Code.

Article 1 can be classified as an exploratory data analysis using heterogeneous statistical instruments to assess socioeconomic indicators between different family groups. The main methodological tools used to validate the analytical results were, among others: parametric and non-parametric mean and median tests used to compare family schooling, poverty and income; percentile analysis to illustrate the distribution of schooling among families; equivalence scales to correctly contrast household income and poverty dominance exploration to identify the incidence, depth and inequality of poverty among family groups.

The second article's methodology is more homogenous, as it uses Nicaragua's 2011/2012 Demographic and Health Survey (ENDESA) to apply the Alkire-Foster (ALKIRE; FOSTER, 2007, 2011) Multidimensional Poverty Index. Within the Alkire-Foster methodology, we adopted the Global Multidimensional Poverty Index (MPI) developed by Alkire and Santos (2010, 2013), which has also been used in the UNDP's Human Development Report since 2010. That international MPI structure was modified to correspond more closely to some of Nicaragua's present structural problems.

Article three adopts the intergenerational earnings' persistence framework introduced in Solon's 1992 seminal paper, and takes into account improvements drawn from more recent empirical studies. Besides calculating the intergenerational earnings' elasticity coefficient through an Instrumental Variables Two Stage Least Squares (IV2SLS) estimator, this article experiments with some other economic mobility tools. In order to obtain more dependable results, that relate to a long-run structural dynamic, article three pools data from the last three EMNV's (2001, 2005 and 2009).

1.4.4 The changing nature of the 'family' concept

Identifying the element in study is not easy, because the very generic analysis object - the family- is a dynamic and complex process, which eventually varies both in shape and content (RODRÍGUEZ SUMAZA; LUENGO RODRÍGUEZ, 2003). Moreover, it is multifaceted, being multiple the aspects that make up the family scenario (relational, cultural, political, economic, legal, religious, personal, etc.).

The "family" institution has contents that do not only vary over time, but also with space, existing a great diversity of family models in every society and in every culture. It is mainly due to these issues that there is no universal concept of family (and therefore of single-parent family) to incorporate or integrate the rich variety of relationships, content, structures,

experiences and functions that characterize the family systems (RODRÍGUEZ SUMAZA; LUENGO RODRÍGUEZ, 2003).

In that sense, a limitation of the study is the changing nature of single mother households. Therefore, it follows that not all single-mother (and biparental) families' structures have inevitably a permanent character. It also means that any transversal analysis to examine the phenomenon of single-motherhood only allows capturing cases existing at the reference date, which brings forth the need to create longitudinal databases that allow for long-run studies.

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II. ARTICLE 1: BIPARENTAL AND SINGLE MOTHER FAMILIES IN NICARAGUA: A HOUSEHOLD SURVEY COMPARISON

1. Abstract

There is a general notion that women are more socially vulnerable than men, with higher poverty rates and less labor market opportunities. That perception is frequently extended for households headed by women, with fear of higher intergenerational poverty transmission for those families. Our research aims to verify the vulnerability hypothesis through the comparison of the living conditions among single-mother and two-parent families in Nicaragua. This inquire can be classified as an exploratory data analysis using heterogeneous statistical instruments to assess socioeconomic indicators between Nicaragua's most representative family groups. Using Nicaragua's last Living Standards Household Study (LSMS-2009), our results show that households headed by single-mothers have similar socioeconomic conditions as families with both parents. On the other hand, there was a greater participation of men in the labor market, while women tend to work fewer hours. Based on gender stereotypes, domestic work is naturalized as feminine, restricting women's performance in public life and in the working world, indicating the continuation of traditional family models as a burden upon Nicaraguan working women. When analyzing poverty under different optics, we found households led by men to be consistently poorer than single-mother and biparental families headed by women. This fact can be explained as a cultural factor associated with secondary poverty in male-headed households, which has to do with men caring less for nutrition and schooling, while often maintaining more than one household or spending money on leisure for their own.

2. Introduction

In contrast with other societies, the single-mother status is not a new pattern in Latin America, but rather a traditional configuration that reflects historical continuity. According to Castro Martín et al. (2010), within-marriage paternity is no longer widely held in Latin America. The study conducted by these authors with vital birth statistics from 13 Latin American countries shows that, since 1970, the relative weight of births to single mothers doubled from 7.3% to 15%.

In this context, Nicaragua offers a relevant research ground to discuss the impact of growing up in a single-mother led family, being the smallest economy in Central America

(contributing to around 7% of the total regional GDP in 2013), it stands as the second poorest Latin-American country, with 42.5% of its population living under the poverty line (Figure 2), according to the last national estimates (INIDE, 2011a).

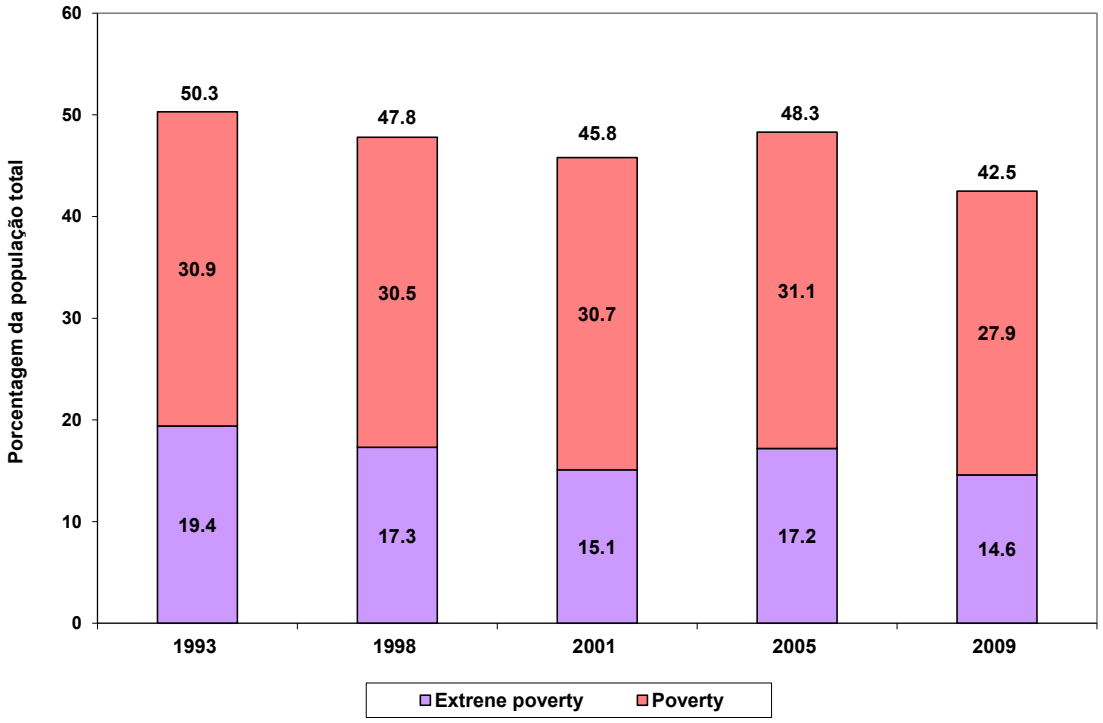

Figure 2: Nicaragua, poverty and extreme poverty rates 1993-2009.
Source: EMNV (1993, 1998, 2001, 2005, 2009).

Nicaragua's poor socioeconomic achievements are partially explained by its low educational achievements, scarce technological integration and lack of financial development (AVENDAÑO, 2008; DE FRANCO, 2011; PORTA; LAGUNA, 2013). Its economy also suffers from structural labor market problems (informality and underemployment), social security financial weaknesses, and high income inequality (ICEFI, 2012; MENDOZA TIJERINO; ALTAMIRANO MONTOYA, 2013).

It is worth noting that the social vulnerability of Nicaraguan families falls in an economic context of sudden and historical changes. The deepening of human poverty caused by the macroeconomic stabilization and structural adjustment process started in the late 1980s and early 1990s, causing a high concentration of wealth in the upper quintiles, with high levels of poverty that persist for decades (AVENDAÑO, 2008).

The Nicaraguan economist Néstor Avendaño (2008) summarizes these macroeconomic adjustment policies directed by the multilateral economic organizations led by the International Monetary Fund (IMF) in an eloquent fashion:

> The first program 'Enhanced Structural Adjustment Facility 1994-1996' (SRAE 1 or ESAF 1) did not contemplate effective measures to address the high social costs of the economic adjustment and structural reforms imposed by the IMF, because behind the ESAF 1 came the war tanks. Having no action to alleviate the situation of the poor to the effects of the economic adjustment, behind the 'Enhanced Structural Adjustment Facility 1998-2001' (SRAE 2 or ESAF 2), ambulances arrived with trials of protection nets for the vulnerable, or better said for the poor, which in 1998 constituted 47.9 percent of the total population. Similarly, behind the 'Poverty Reduction and Growth Facility 2002-2005' program (SCLP 1 or 1 PRGF), came the infantry, that is, the small business groups that concentrated national income and turned Nicaragua into one of the Latin American countries with greater inequality in income distribution (AVENDAÑO, 2008, p.23).

In addition to poverty, another explaining factor for the continued presence of single mothers in Nicaragua, as elsewhere in Latin America, is premature fecundity. The State of World Population 2013 (UNFPA, 2013) noted that Nicaragua is the Latin American country with the highest percentage of early pregnancy, as 28.1% of women between 20 and 24 years old reported having given birth before the age of 18, a percentage that is second only to sub-Saharan Africa's poor countries. The report also indicates that Latin America and the Caribbean is the only region where births to girls under 15 years increased, and it is expected for those deliveries to increase slightly until 2030.

Another element that may influence the high presence of female lone parents is the agricultural base of the Nicaraguan economy. This produces a first migratory phenomenon during the months of the coffee and sugar harvest, when many people leave their families to work on farms and plantations, affecting directly their lives and family relationships. Additionally, a second, and demographically more recent migration flow (about 25 years old) happens as many Nicaraguan workers migrate to other countries in search of better paid jobs, especially to Costa Rica and the United States (BAUMEISTER, 2006; GONZÁLEZ, 2012).

Growing up in families without their biological parents is a common experience for Nicaraguan children. Data from the latest Demographic and Health Survey (DHS/ENDESA - 2011/2012) shows that only 71.4% of children (0-18 years old) lived with both biological parents[6]. Of the 28.6% who did not live with both parents at the time of interview, 17.2% had a living biological father and in 2.3% of the observations the father was deceased. Still, 8.8% of men declared married or with a stable partner stated having children that did not live with them.

[6] Arends-kuenning and Moylan (2012) estimated this figure in 76% with data from previous ENDESA (2006/2007).

The abandonment of responsibilities by men is a phenomenon inserted in a larger background of social discrimination against women. In Nicaragua, the power in gender relations is subject to a patriarchal culture that favors men, suppressing women's freedoms both explicitly and tacitly. This view is shared by Merrill as he briefly explains the reality of Nicaraguan women:

> Collectively, the lives of Nicaraguan women are shaped by traditional Hispanic values regarding appropriate sex roles and high fertility [...]. Although the Sandinista revolution[7] drew thousands of women into public life, encouraged females to work outside the home, spawned a national women's movement, and enshrined gender equality in the national constitution, it left largely intact the values, beliefs, and social customs that traditionally had regulated relations between the sexes (MERRILL, 1993, p.82).

On the other hand, according to the 2014 Global Gender Gap Report (HAUSMANN et al., 2014), Nicaragua reached sixth place as one of the best countries in the world in terms of gender equity, only behind Iceland, Finland, Norway, Denmark and Sweden. This news were received with astonishment and indignation by the Nicaraguan feminist movement, criticizing this gender gap index as being a simplistic checklist that cannot embody the actual process of women's empowerment in Nicaragua. As one article expands: "The equivocal results of this report have to do with the quantitative logic, ahistorical view and market-centrism of the neoliberal thought of its authors, lacking a proper theoretical framework to focus gender inequality and the status of women" (MONTENEGRO, 2014).

To the leaders of the feminist movement, there are inconsistencies between government speech and State actions in favor of women. In an interview with Noticias Aliadas, Patricia Orozco, regional coordinator of the Confluencia Feminista Mesoamericana (Petateras) suggests that, in Nicaragua, the State and the Church exercise institutional violence against women (HERRERA, 2013). The feminist leader exemplifies this violence as follows:

> Institutional violence, because abortion is penalized and the right of women to decide about their bodies and their lives is not recognized; institutional violence, because women do not have jobs and their only way out is to work in the textile industry, where many suffer sexual violence and are not allowed to organize (HERRERA, 2013, p. 2).

[7] Political process between 1979 and 1990, starring the Frente Sandinista de Liberación Nacional (FSLN), which ended the 43 years dictatorship of the Somoza family, and led a democratic government of progressive leftist parties. The main large-scale programs of the Sandinistas received international recognition for their gains in literacy, health care, education, childcare, unions, and land reform.

Regarding that matter, Nicaragua's birth statistics reflect a general lack of sexual education, which accompanied by the prohibition of abortion, results in high fertility rates for younger women. Moreover, sexual and reproductive health materials were only introduced in the Ministry of Education's curriculum in 2009, after years of opposition from Catholic leaders. According to UNFPA (2013), in Nicaragua only 18% of primary and secondary schools use the official sexual and reproductive education guide.

This political, economic and social scenario has caused single-motherhood to be a recurring phenomenon in Nicaragua. Faced with this context, we question the notion of women being poorer and disadvantaged in relation to men, and thus transmitting their conditions upon their children. The general aim of this article was to analyze, comparatively, the socioeconomic conditions of single-mother and two-parent families, using Nicaragua's last national household survey. Our specific objectives were to contrast the levels of schooling, school attendance, income, labor market participation and poverty among family groups and its members.

3. Review of empirical approaches

Most studies on single-motherhood have been focused in the developed world, and only in recent decades studies have been conducted in Latin America. A first group of authors concentrates on the socioeconomic vulnerability and intergenerational transmission of poverty in female-headed households with dependent children (MCLANAHAN; BOOTH, 1989; GARFINKEL et al., 1998; MORÁN et al, 2003; MCLANAHAN, 2004; RICH et al., 2007; MCLANAHAN; BECK, 2010; NEPOMNYASCHY; GARFINKEL, 2010).

Other authors from this group study the impact of parents' separation on child support, public policies that support children in "broken homes" and the legal apparatus associated with child support in families headed by women (BUVINIC; GUPTA, 1997; GARFINKEL et al., 1998; KALIL; RYAN, 2010; CASTRO MARTÍN et al., 2010; NEPOMNYASCHY; GARFINKEL, 2010).

Research by Steinberg and Silverberg (1986), Brown et al. (1993) and Steinberg (2001, 2005) show how teens from single-mother households are more likely to engage in activities such as smoking, poor school performance, or even criminal acts, such as delinquency, when compared with their age mates from families with both parents. In addition, according to Paschall, Ringwalt, and Flewelling (2003), having a stepfather

increases the likelihood of socially deviant behavior, which indicates that the father's role is a complex identity to simulate effectively.

Furthermore, poor families often need their children to work at an early age to compensate for insufficient levels of household income. Other studies also indicate that living in a single-mother family is a risk factor that translates into low educational attainments and poor health for children (JEYNES, 2002; ARENDS-KUENNING; DURYEA, 2006; ARENDS-KUENNING; MOYLAN, 2012).

The potential socio-economic difficulties faced by female lone parents are usually derived from their economic vulnerability and financial and educational fragility, which lead them to intense work days and make them face the challenge of reconciling paid work with the tasks of family life (VITALE, 2002).

A second group of authors is centered on the works of Chant (1985, 1997, 2007, 2008), which considers the phenomenon of lone motherhood within a broader context of gender discriminations. For this group, it is important to understand motherhood deeply, placed in the processes of feminist struggles, criticizing the studies that generalize the socioeconomic characterizations of families headed by women (ECLAC, 2004; BRADSHAW; QUIRÓS, 2008; BRADSHAW, 2009). Nonetheless, they admit the high prevalence of poverty within these family structures, as well as the lack of government actions in this line (BLUMBERG, 1988; CHANT, 2007, 2008; BRADSHAW, 2008, 2009).

Chant and Campling (1997) and Chant (1985, 2007) argue that the assumption that households headed by women are poor and tend to undermine children's well-being is misleading, because households headed by men also experience such vulnerabilities. Chant (2007, p. 29) argues that "female-headed households may have more earners (and earnings) than their male-headed counterparts because they make fuller use of household labour supply". This happens because some men forbid their wives or daughters to work outside the house or neighborhood.

Another factor that can inhibit the notion of female-headed households as the poorest amongst the poor is the

> empirical evidence from a variety of contexts [that] indicates that patterns of intra-household distribution may work more in favour of children in female- than male-headed households with positive effects on their nutritional intake, health care and education (CHANT, 2007, p.31).

The empirical evidence for Nicaragua challenges the assumption of there being an over-representation of the female in the universe of the poor. In this respect, the incidence of poverty by gender and age groups shown in Table 1 notes the increased presence of men in the poor and extremely poor. The data also illustrates a more pronounced frequency of poverty and extreme poverty for the first three age groups, namely people 0-17 years old.

Table 1 Poverty incidence by sex and age groups, population percentages. Nicaragua - 2009.

	Non poor			Poor			Extreme poor		
Age (years)	Total	Men	Women	Total	Men	Women	Total	Men	Women
National	57.5	56.8	58.1	42.5	43.2	41.9	14.6	15.4	13.9
0 a 5	50.1	50.7	49.5	49.9	49.3	50.5	18.5	18.3	18.7
6 a 12	48.2	48.4	48.1	51.8	51.6	51.9	19.5	20.2	18.7
13 a 17	51.6	51.4	51.8	48.4	48.6	48.2	19.0	20.0	17.9
18 a 25	58.4	56.7	59.8	41.6	43.3	40.2	12.8	14.5	11.2
26 a 35	63.9	64.3	63.4	36.1	35.7	36.6	10.7	10.4	11.1
36 a 45	64.0	64.8	63.1	36.0	35.2	36.9	11.7	10.5	12.7
46 a 55	65.9	63.8	67.8	34.1	36.2	32.2	11.2	13.4	9.3
56 a 65	64.5	64.1	64.7	35.5	35.9	35.3	11.6	11.3	11.8
66 or more	66.3	62.6	69.3	33.7	37.4	30.7	9.7	12.2	7.7

Source: Adapted from INIDE (2011).

A more intuitive poverty indicator is the gap or depth of poverty, which measures the relative consumption deficit of the poor relative to the poverty line value —the necessary income for each poor unit, household or person to stop being poor or indigent— (FOSTER; GREER; THORBECKE, 1984).

According to the poverty and extreme poverty gap estimates produced by the Economic Commission for Latin America and the Caribbean (CEPAL, 2013), households headed by women are less poor than male-headed households, rejecting a priori the feminization of poverty in Nicaragua.

As shown in Table 2, to eliminate poverty and extreme poverty, families headed by men required more resources than those headed by women. While, in 2009, households headed by men required an additional income of 27.0% and 12.4% for the eradication of poverty and extreme poverty, respectively, the consumption deficit necessary for the elimination of those poverty levels in female-led families was of 24.2% and 10.2%. However, in urban areas the gap was slightly higher in women headed households, both for general (21.6%) and extreme poverty (7.5%).

Table 2 Poverty and extreme poverty gap coefficients, by family head's sex and area of residence. Nicaragua - 2009, percentages.

Area of residence	National		Urban		Rural	
Extreme poverty	Male heads	Women heads	Male heads	Women heads	Male heads	Women heads
1993	24.6	23.4	15.5	19.8	33.6	32.5
1998	23.3	20.6	14.3	16.5	32.0	29.8
2001	19.7	17.9	12.5	14.1	27.8	27.8
2005	13.1	10.5	6.5	7.3	19.5	18.2
2009	12.4	10.2	7.3	7.5	17.6	16.4
Poverty	Male heads	Women heads	Male heads	Women heads	Male heads	Women heads
1993	42.3	41.1	33.0	38.8	51.4	46.8
1998	39.6	38.9	31.6	35.4	47.4	46.8
2001	37.3	36.3	30.6	33.0	44.9	45.1
2005	30.2	26.5	22.7	23.0	37.5	35.1
2009	27.0	24.2	21.1	21.6	33.0	30.2

Source: CEPALSTAT. Gender Indicators and Statistics.

Reviewing the poverty reduction strategies in Nicaragua, Bradshaw and Quirós (2008) and Bradshaw (2008) recognize the dangers of erroneously associating the feminization of poverty ipso facto to families headed by women, criticizing public policy that use women as means and do not value them as the ends of development. According to Bradshaw (2008):

> Targeting resources at women means that men's behaviour is implicitly recognized as problematic but is not addressed, while the personal deprivation suffered by women through their altruism is not problematized but explicitly reinforced as the social norm (BRADSHAW, 2008, p.195).

In the gender analysis of the 'Red de Protección Social', the first program of conditional cash transfers to the poor in Nicaragua, Bradshaw and Quirós (2008) suggest that this program did not take into account the opportunity costs —especially in the use of productive time— of female beneficiaries. Their recommendation is then to avoid poverty reduction policies in which women are invisible beings or seen only as a means to ensure the development of others.

Other authors explain how the anti-poverty policies that work with women reproduce the symbolic patterns of discrimination, representing women as inherently vulnerable beings, or as victims (ECLAC, 2004; MOLYNEUX, 2007). This discourse is limited, as it diverts the attention from the rights to the efficiencies of women as instruments of the State.

Thus, in the specific context of poverty reduction strategies it is necessary to consider the warning given by Bradshaw and Linneker (1996, p.22), by claiming that "Policies that aim to reduce poverty, not the gender inequalities at the basis of that poverty, may be seen as

unlikely to succeed in improving even the economic position of women". It is thus important to look critically at the feminization of poverty reduction policies, and to promote the inclusion of men as key actors of these strategies.

The debate presented in this section motivated our research, which aims to answer the following questions: What are the characteristics of single-mother families in Nicaragua? Do they have higher economic dependency rates than biparental families? Are their children deprived in schooling due to that economic burden? Are they poorer when compared to families with both parents? It is important to address these questions, as their answers can shed light to the distribution of resources and responsibilities within Nicaragua's most typical family groups.

4. Methodology

This article was developed using a database provided by the National Institute of Development Information (INIDE, for its acronym in Spanish). Particularly, we used the Household Survey of Living Standard Measurement (EMNV, for its acronym in Spanish). The last EMNV was collected in 2009 and its database was published in 2011 by INIDE in its web page[8].

The EMNV 2009 database consists of 7,520 households (30,432 people interviewed), which, according to INIDE (2011), allows to obtain representative estimates at national level, for urban-rural areas, and for Nicaragua's seven macro regions. Nicaragua had a total population of 5.7 million inhabitants in 2009.

Our study can be classified as an exploratory data analysis using heterogeneous statistical instruments to assess socioeconomic indicators between Nicaragua's most representative family groups. The main methodological tools used to validate the analytical results were, among others: parametric and non-parametric mean and median tests used to compare family schooling, poverty and income; percentile analysis to illustrate the distribution of schooling among families; equivalence scales to correctly contrast household income and poverty dominance exploration to identify the incidence, depth and inequality of poverty among family groups.

The results are divided in two main themes. First, section 5.1 presents the socio-demographic statistics that help contrast the following indicators among single-mother and

[8] http://www.inide.gob.ni/

biparental households: family structure, schooling and school attendance, and the dominance of poverty. Section 5.2 first studies the families' insertion and participation in the labor market, to then compare the differences in income between families.

5. Results and discussion

5.1 Socio-demographic characterization: a household comparative analysis

According to the EMNV database, in 2009, there were 1 million 211 thousand households in Nicaragua, of which 794,000 (65.6%) were headed by men and 416,000 (34.4%) by women. Of that total universe, 207,866 households were identified as being headed by single women[9] (17.2% of Nicaraguan families in 2009) and 809,353 as having both parents, with the remainder, 193,357 families, composed by single-male heads, widow(ers), and single, divorced or separated men.

To define more clearly the population under study, only those households with underage children were chosen[10], as a proxy for economic dependence. Thus, the number of single-mother households is reduced to 106,756 (consisting of 481,340 people), while the number of two-parent families with dependent children is reduced to 587,847 (consisting of 3,105,389 people). It is worth mentioning that men headed 87.9% of two-parent households.

Table 3 illustrates both households, classifying them according to the marital status of the family head, showing how the predominant marital status for single mothers is that of "separate" and not that of "divorced" —the legitimate civil status that guarantees women's rights—, confirming once again the single-mother syndrome as a contemporary problem in Nicaragua.

In fact, there is a gender disparity between the number of married/accompanied and separate family heads. On the national count, the proportion of family heads declared as "separate" is much higher for women (40.8%) than for men (4.7%), while the share of married/accompanied male heads (89.0%) exceeds that of female heads (24.7%). This could imply that a large part of families are headed by women as a result of conjugal disruption and not as a matter of women's choice, while also suggesting that men are less often made responsible with direct family care when the couple separates.

[9] Our classification of 'single-mother' is a mother, family head, which self-declared herself as being single, separated or divorced.
[10] In Nicaragua, adulthood begins legally at 18, according to Article 299 of the Family Code.

Table 3 - Single-mother and biparental households (with children under 18) by marital status, Nicaragua - 2009

Marital status	Single-mother families		Biparental families	
	No. of households	%	No. of households	%
Stable union	-	-	296.294	50,4
Married	-	-	291.553	49,6
Separated	96.366	90,3	-	-
Divorced	2.992	2,8	-	-
Single	7.398	6,9	-	-
Total	106.756	100,0	587.847	100,0

Source: Author's tabulations from EMNV 2009, using survey weights.

Excluding household heads —and their spouses in the case of biparental families— the average number of members per household was 3.5 for single-mother households and 3.3 for those with both parents. On the other hand, the average number of dependent children was slightly higher in two-parent households, with 2.4 children, whereas in single-mother families this average was 2.0, showing a similar economic dependency rate for both family types.

In two-parent households, the average age of the heads was 39.7 years, with a minimum of 17 and maximum of 97 years, the youngest 25% having 31 years or less and the oldest 75% having 47 years or more. In turn, single mothers had an average age of 39.6 years, with a minimum of 15 and maximum of 75 years, the youngest 25% having 33 years or less and the oldest 75% having 46 years or more.

In contrast, children in two-parent households presented an average age of 9.2 years, with the youngest 25% having 5 years or less. Single-mothers' children had a higher average age of 10.6 years, with the youngest 25% having 7 years or less. This higher average age of children in single mother families suggests single mothers give birth at a younger age than biparental mothers.

One of the key challenges Nicaraguan public policy faces is the need to invest in human capital in order to improve the educational attainments of its population. Data from EMNV reveals that, in 2009, Nicaraguans had an average of six years of schooling. Still, the difference between areas of residence was expressive, once people who lived in rural areas had significantly lower schooling levels than those living in urban areas: four years versus seven years, respectively.

Data from EMNV also showed that with an average of 7.3 years of formal schooling, single mothers had higher educational achievements than chiefs in two-parent households, with an average of 5.8 years of schooling for male heads and 6.4 for female heads. For men,

poor schooling in rural areas would be responsible for lowering average educational levels, as rural children traditionally function as a source of agricultural labor.

These figures suggest greater pressures for single mothers to educate themselves in view of the lower labor supply available in the absence of the partner. Figure 3 displays the educational levels of household heads by its percentiles of years of schooling.

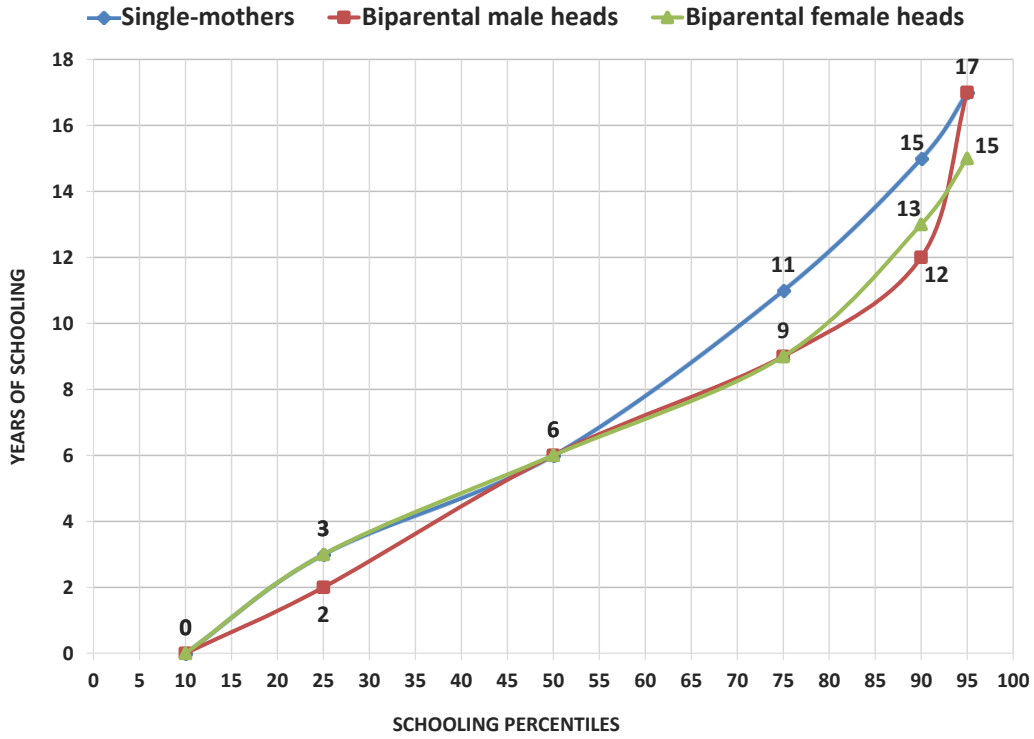

Figure 3: Household heads' years of schooling distribution.
Source: With data from EMNV (2009).

Single-mothers' greater schooling was observed both for lower and higher educational levels. For example, although 25% of the most educated biparental heads had nine or more years of formal education, the same percentile of the most educated single mothers revealed a schooling of 11 years or more.

Another way to examine the educational attainment of household heads is classifying the years of schooling by instruction levels. This classification scheme has the advantage of reducing the bias caused by extreme levels of education, when education is measured in consecutive years of schooling.

According to Nicaragua's General Law of Education (No. 582, Art. 12), the first educational subsystem is known as Basic Education, and covers preschool, primary and secondary education (first 11 years of schooling). The second subsystem comprises technical education and/or professional training, and the third covers undergraduate and graduate levels.

Table 4 shows the percentages of household heads according to its educational accomplishments.

Table 4 Household heads' educational levels
Nicaragua - 2009 (%)

Attainment	Single-mothers	Biparental heads	
		Women	Men
Non/preschool	13.1	14.5	20.4
Adult education	3.1	1.5	2.1
Incomplete primary	21.2	28.3	28.3
Complete primary	14.9	12.2	14.2
Incomplete secondary	20.0	22.6	16.9
Complete secondary	10.0	8.5	7.5
Technical	5.4	3.0	2.1
Incomplete university	3.3	5.3	3.3
Complete university	8.9	3.1	4.9
Master/doctarate	0.1	1.0	0.4
Total	100.0	100.0	100.0

Source: Author's tabulations from EMNV 2009, using survey weights.

Table 4 confirms that women heads had more educational attainments than male heads. In this way, while 7.5% of male chiefs reported having completed their basic education studies (similar to high school education), the completion rate was of 10.0% for single mothers and 8.5% for female heads in biparental homes. These results are explained in part by the greater participation of men in premature labor activities, mostly in agricultural occupations in rural areas, as evidenced in the case of children, later in the article.

Furthermore, the data revealed that a similar percentage of single mothers (14.9%), male bosses (14.2%) and female heads (12.2%) completed primary education (first 6 years of schooling). Likewise, a higher percentage of single mothers had technical education (5.4%), compared to 3.0% and 2.1% for women and men heads in households with both parents.

According to Laguna and Porta (2013, p.27), Nicaraguan family heads need to have at least 7-10 years of schooling and 1-10 years of working experience in order to keep a family of two members out of poverty. For two-parent families, if both spouses work, that educational level would allow to uphold out of poverty a family of four. With that criteria, it can be stated that single mothers had better educational conditions to support their families and keep them above the poverty line.

In the case of children, we found slightly superior educational levels for those in single-mother households, with an average schooling of 4.9 years, with 4.4 years for sons and 5.3 for daughters. In contrast, children with both parents had an average schooling of 4.1 years, with 4.0 years for sons and 4.3 for daughters.

Once more, the educational gap between areas of residence is significant, because children in single-mother families showed an average schooling of 3.9 years in rural areas and 5.3 in urban areas. For children in biparental households, the average was 3.6 years in rural areas and 4.7 in the cities.

There were similar conditions for school-age children with regard to their enrollment and retention in the formal education system. Of the 161,112 children —older than seven and younger than 18— in single-mother households, 82.3% were enrolled in the school year, and of these, 97.4% were attending classes. In biparental households, of the total 864,445 children, 79.6% were enrolled, and 96.0% attended classes at the time of the interview. It is worth noting that the percentage of students enrolled —in both household arrays— was greater for daughters.

For school-age children in both families, the three main reasons for not being enrolled in school were lack of money, lack of interest and occupation in rural work (Table 5). It is worth mentioning that for daughters in single-mother households, pregnancy was a more important reason for not being enrolled in school, when compared to daughters in biparental families (4.5% versus 2.2%).

Table 5 - Reasons for children (7 years and older) not being enrolled in school, by children's sex, Nicaragua - 2009

%

Reasons	Single-mother children		Children with both parents	
	Men	Women	Men	Women
Lack of money	**35,0**	**41,3**	**28,9**	**24,9**
Lack of interest	**21,7**	**24,6**	**29,8**	**25,1**
Agricultural labor	**30,7**	5,3	**21,9**	3,3
Distant school	0,4	0,6	6,4	**17,4**
Family problems	1,5	2,5	4,3	10,5
Disease/Chronic disability	7,9	**11,7**	4,7	4,3
Cares for children	-	**8,1**	-	2,3
Pregnancy	-	**4,5**	-	2,2
Household chores	-	0,9	0,06	3,6
Lack of safety	1,9	-	1,4	2,4
Lack of teachers	-	-	1,5	1,2
Other	0,4	-	0,6	0,6
Ignored	0,5	-	0,2	0,8
Class not offered	-	0,6	0,05	0,8
No vacancy	-	-	0,13	0,6

Source: Author's tabulations from EMNV 2009, using survey weights.

Moreover, agricultural tasks were the second reason for single-mother sons not being in school, contributing to 30.7% of cases. As for male offspring with both parents, this was the third reason, totaling 21.9% of observations.

In general, lack of money was the main cause for single-mothers' children not to attend school, representing a weighted average of 37.6% of cases. For families with greater budget constraint, these figures suggest a reallocation of daughters' time in childcare (8.1% of cases), and sons' time in agricultural work. For children in of two-parent families the lack of financial resources explained, as an weighted average, 27.4% of school absences, the first reason being lack of interest, with 28.1% of cases.

It was of our interest to analyze the incidence and depth of poverty among the household arrangements under study. INIDE (2011) estimated the value of the general consumption poverty line in C$ 11,725.09 (equivalent to US$ 568.65) per person per year, or US$ 48.04 per person per month. For extreme poverty, the line was fixed at a value of US$ 334.79 per person per year, equivalent to US$ 27.90 per person per month.

Using the consumption poverty[11] line estimated by INIDE, wives and male heads in two-parent households exhibited the highest levels of poverty and extreme poverty of all family groups. These wives and men heads presented a statistically equal poverty incidence rate, with 41.7% for wives and 41.4% for men heads. There was also no statistical difference between the incidence of poverty between husbands in two-parent homes (33.9%), single mothers (33.6%) and female heads in two-parent households (32.4%).

For extreme poverty, there was no evidence of statistical differences between any of the heads or spouses under review. Moreover, there was no evidence of statistical differences in extreme poverty rates between any of the heads or spouses under review. The percentage of extremely poor two-parent wives was 12.5%, with 12.4% for male heads in biparental households, 9.6% for single mothers, 9.1% for biparental husbands and 9.0% for two-parent female heads.

As for poverty levels in household members (Figure 4), data showed a slightly larger number of poor and extremely poor people in two-parent families, with statistically significant differences at the national level. Figure 4 also illustrates, for all household arrangements, the rural bias of poverty in Nicaragua, as the weighted average percentage of non-poor in urban areas was 70%, while in rural areas this percentage reduced to 34%.

[11] For comparing the different poverty and extreme poverty indices we used the subgroup poverty tests from the DASP module developed by Abdelkrim and Duclos (2007) for STATA, with a confidence interval of 95%.

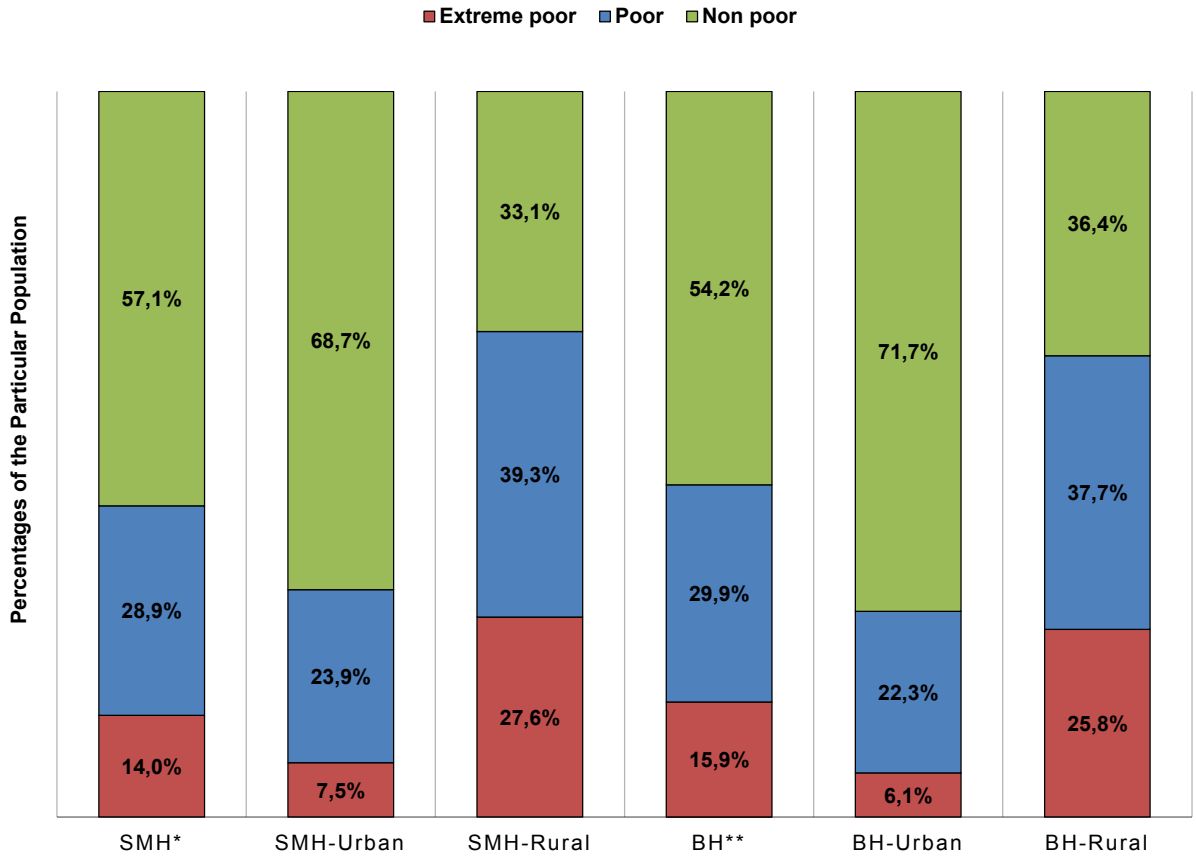

Figure 4: Poverty incidence among household members, by area of residence.
Source: With data from EMNV (2009). *Single-mother households **Biparental households

The poverty gap for single mothers reveals a depth of poverty of 11.0%, and of extreme poverty of 2.2%. These percentages were statistically lower than the national average, but equal to the average of biparental heads. The depth of poverty and extreme poverty was higher for wives and biparental male heads, and lower for female heads and biparental husbands.

According to the poverty and extreme poverty gap calculations, it is interesting to note a greater depth of poverty in members of male-headed biparental households. While in 2009 people in two-parent households headed by men required an additional income of 16.5% and 4.6% for the eradication of poverty and extreme poverty, respectively, the consumption deficit necessary to eliminate these poverty levels in single-mother households was 14.8% and 3.3%. The lowest poverty gap was found in members of female-led biparental households, with a consumption deficit of 12.4% and 2.3% for the poor and extreme poor respectively.

Figure 5, known as a TIP curve, for Three I's of Poverty (JENKINS; LAMBERT, 1997; JENKINS, 2006), graphically summarizes the incidence, depth and inequality of poverty in members of single-mother, male-headed and female-headed biparental households.

This graph is relevant, as it illustrates the poverty dominance[12] of people in two-parent families headed by men over people in single-mother families.

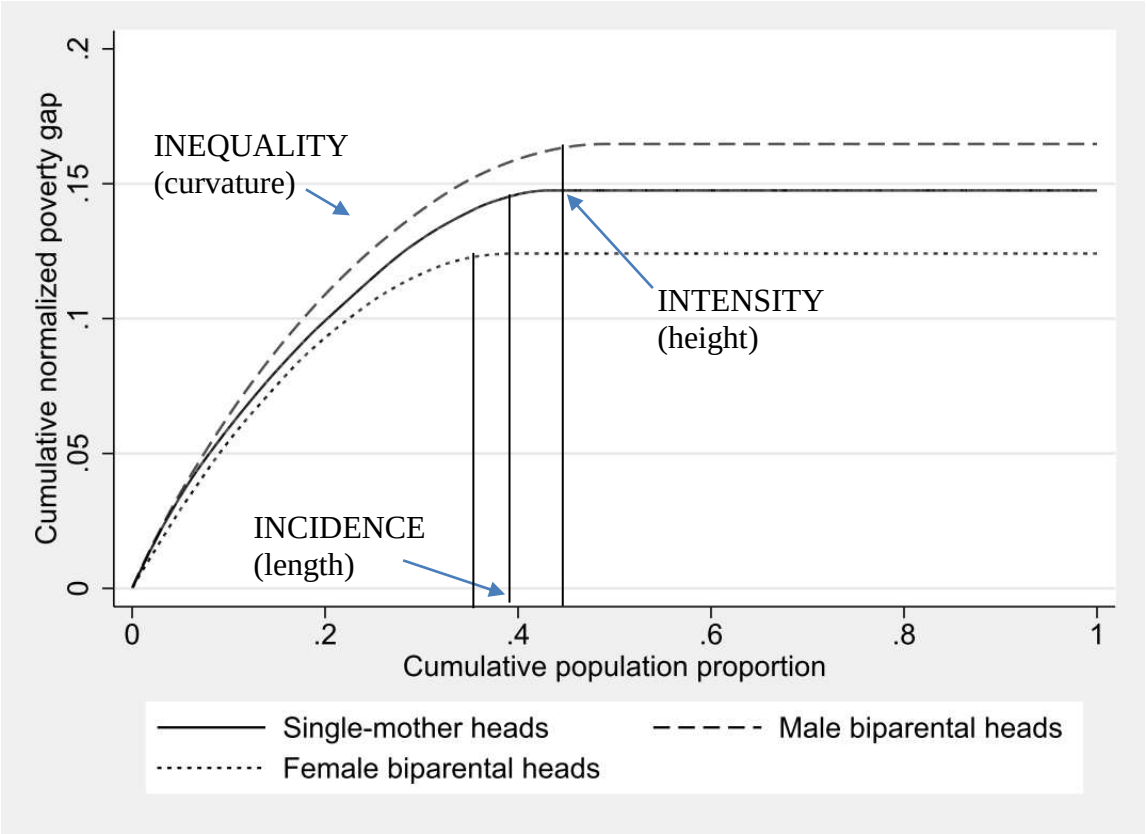

Figure 5: TIP curves for household members, by head's sex.
Source: With data from EMNV (2009).

In addition to illustrating the poverty incidence and gap, Figure 5 shows the inequality of poverty, a measure of poverty related to the distribution of consumption deficits (relative to the poverty line) among the poor. This inequality is defined by the extension of the curves' concavity in its non-horizontal sections —if there were equality in consumption among the poor, this section would be a straight line—. For the three household sets under study, this measure distinguishes a less unequal distribution of consumption among the poorest segments of the poor, with more inequality (concavity) in the upper portion of the curve, corresponding to the poor closest to the poverty line.

Using different measures of human poverty, it can be concluded that in 2009, people in single-mother households, contrary to the simplest hypothesis of greater economic

[12] This implies that one might raise or lower income or the poverty line for these subgroups without changing the order of poverty among them. See Jenkins and Lambert (1997, p.321).

vulnerability, were not poorer or in need of more resources to get out of poverty, when compared to the bulk of biparental families (represented by male headed households).

5.2 Labor market participation and household income

Nicaragua's economic growth model is not productive nor sustainable, as it is based on static comparative advantages: exploitation of unskilled labor and natural resources (INCER BARQUERO, 2012). Moreover, Nicaragua is a highly unequal society, because according EMNV-2009 data, 50% of the richest seized 79.8% of total income. To understand how these dynamics affects the well-being of single-mother households, we will first analyze the families' labor profile, to then examine income distribution for all family arrays under study.

Nicaragua' labor market suffers from structural problems that inhibit vertical economic mobility, especially for young people, who start their working life in precarious jobs, with outdated technology, lack of contracts, no social security and proper safety conditions. As many come from poor families, there is a high risk of intergenerational poverty transmission (DE FRANCO, 2011; MENDOZA TIJERINO; ALTAMIRANO MONTOYA, 2013; AVENDAÑO, 2014).

According to the EMNV-2009 database, from 106,756 women identified as single mothers, 28.4% said they had not worked the week preceding the interview. This inoccupation rate was lower for two-parent male heads, with 7.8%, and higher for female heads in biparental families, with 34.9%. The highest inoccupation rate was observed in wives in two-parent families, with 60.4%, while the husbands on these households had an inoccupation of 17.7%. These rates suggest that separation forces single mothers to add to the role as caretakers assigned to their sex, the working role of their absent partner.

Data also revealed that biparental men heads worked more hours per week compared to biparental female heads and single mothers. While only 55.3% of single mothers said to work over 40 hours per week, this percentage was of 72.3% for men heading biparental households, and of 55.0% for women heads in two-parent families.

On the other hand, only 4.9% of unoccupied single mothers reported devoting at least one hour a week to other productive activities (in which stand out services to third persons and food production in backyards). Unoccupied biparental male heads also displayed a greater participation in other activities, as 18.0% of respondents said they were engaged in growing

and harvesting food. Unoccupied women heads in two-parent families had a similar inactivity rate as single mothers, with only 5.7% irregularly employed in other various activities.

When unoccupied single mothers were asked why they did not seek for employment, 67.7% answered that they were responsible for “household chores”, 12.0% because “they had no one to care for their younger children” and 10.8% for having “chronic illness/disability”. Women heads in two-parent families repeat the pattern of single mothers, the main reasons being: “household chores” (80.1%), “has no one to care for their young children” (10.4%), and, “chronic illness/disability” (3.4%). These figures suggest that, based on gender stereotypes, domestic work is naturalized as feminine, restricting women’s performance in public life and in the working world, and indicating the continuation of traditional family models as a burden upon Nicaraguan working women. As for male heads in two-parent families, the three main reasons for not seeking an occupation were “tired of looking” (23.3%), “another reason” (21.6%), and “chronic illness/disability” (13.2%).

For unoccupied female heads, it was interesting to note that, when asked if they would be available to work if the opportunity existed, the percentage of single mothers who answered “yes” was 56.3%, while for female heads in biparental families it was 41.7%.

In single-mother households, 43.0% of its members were active workers, resulting in 2.3 workers per household (or 1.1 workers per dependent child). In families with both parents, the occupancy rate was higher, as 50.3% of its members said they were working, with an average of 2.7 persons employed per household member, or 1.1 active workers for each child under age. Again, this evidence weakens the assumption of greater intrinsic economic vulnerability for single-mother households.

To examine family revenue, income was transformed into a monthly frequency assuming that households received it on a regular basis, and converted into dollars using the average exchange rate for 2009. We used equivalence scales to adjust monthly household income in order to allow comparisons between households with different sizes and structures.

In particular, we adopted the equivalence scale used by the Organization for Economic Cooperation and Development ("OECD-modified scale"), recommended and applied by the OECD and the European Commission in many national social programs to examine —at the household level— the living standards and poverty among heterogeneous family

arrangements (FÖRSTER, 1994; BURNIAUX et al., 1998; RIO GROUP, 2006; STIGLITZ; SEN; FITOUSSI, 2009; OECD, 2011a)[13].

The idea is to incorporate the assumption of economies of scale in household consumption, as each additional member needs a less than proportional increase in family income in order to maintain a certain level of well-being. This OECD note explains the scale in the following sense:

> The needs of a household grow with each additional member but –due to economies of scale in consumption– not in a proportional way. Needs for housing space, electricity, etc. will not be three times as high for a household with three members than for a single person.[...] The factors commonly taken into account to assign these values are the size of the household and the age of its members (whether they are adults or children) (OECD, 2011b).

The weighting is done by dividing the household income between its equivalence scale, which assigns a value of 1 to the first adult in the family; 0.5 to the second and each subsequent person aged 14 years or more; and 0.3 for each child under 14 years. This scale suggests, for example, that in a single-mother household with a child of three years and another of 18 years, the mother would contribute with 1, the three year old child with 0.3 and the eldest son with 0.5, giving a total equivalence scale of 1.8. In other words, this family would need an income 28% lower than a couple with two children of the same age would in order to achieve the same standard of living.

Before starting the diagnosis, it should be mentioned that the exploratory data analysis showed a positive bias (positive skewness and leptokurtosis) in the distribution of income frequencies. When estimating the average monthly household income with the robust method suggested by Hamilton (2010), to avoid the distortion caused by extreme values, we identified an overestimation in the conventional average calculation for that variable.

At the same time, it is evident for this variable (in the Nicaraguan case), that the best estimate is given by the median, as suggested by Stiglitz et al (2009), for countries with high levels of income inequality. Therefore, to compare the mean and the median Household Equivalent Income (HEI) among family groups, we used the Mann-Whitney U test and the nonparametric median test, given the lack of normality in the dependent variable and the wide difference in sample sizes between the two family groups under scrutiny (HAMILTON, 2006, CORDER; FOREMAN, 2009, ACOCK, 2010).

[13] For an empirical comparison of different equivalence scales, see Hagenaars et al. (1994).

With an equivalent monthly income of US$ 131, biparental households had, on average, statistically superior revenues than single-mother households, with a monthly income of US$ 114 (z=2.94/p=0.003). However, the average income does not allow a categorical conclusion about the income superiority in two-parent families, because the median income does not differ statistically for both households, with US$ 96 for single-mother households and US$ 90 for biparental households (χ^2=1.306/p=0.253).

When speaking of income it is important to recognize that families living in their own homes implicitly receive an income equal to the market value for the service or use of that property. Such compensation should be considered as part of the family income, even if it never formalizes in the actual market (CEDLAS; BANCO MUNDIAL, 2012). The EMNV's income section includes a monthly monetary provision for families who own their own homes (79.1% of single-mother and 77.9% of biparental families owned houses). By adding this additional compensation, and transforming it with the equivalence scale, we observe a median equivalised income of US$ 133 for single mother households, and of US$ 120 for two-parent families, also lacking statistical difference between them (χ^2=2,622/p=0,105). Given this uncertainty, we tried to compare the statistical difference between quintiles of the median HEI, presented in Table 6.

Table 6 Equivalised Median Household Income (EHI). Median contrast by quintile of income
United States dollars. Nicaragua - 2009

Quintile	Single-mother households			Biparental households			EHI median test	Median test with house provision
	Households	EHI	With house provision	Households	EHI	With house provision	Pearson-χ^2/Pr	Pearson-χ^2/Pr
1	24,008	32.8	52.0	148,501	36.5	54.2	0.247/ 0.620	0.509/0.476
2	18,679	70.2	99.9	126,508	70.5	98.4	0.001/0.976	6.657/0.010
3	22,310	107.0	140.5	108,775	102.4	144.7	4.193/0.041	1.501/0.220
4	13,676	154.7	213.8	99,093	151.6	210.8	0.115/0.734	20.37/0.000
5	11,852	250.9	402.5	93,481	285.5	389.9	1.871/0.171	26.31/0.000
Total	90,525	95.5	133.5	576,358	90.4	120.1	1.306/0.253	2.622/0.105

Source: Author's tabulations from EMNV 2009, using survey weights.

From contrast of medians, there was no statistical difference in the equivalised household income between family groups, for most quintiles. For family incomes without house ownership provision, the only statistical difference was found for the third quintile (with a marginal nominal gap).

As illustrated by Table 6, there were more statistical differences among household incomes when house ownership was included as a monetary input. For that income category, evidence revealed significance differences in quintiles 2, 4 and 5. However, nominal

differences were minimal, the median being greater for single-mother families in all three cases.

By studying the income distribution in each household group separately, we found a greater inequality in two-parent families, with a Gini coefficient of 0.46[14]. Single-mother households had a Gini of 0.41. On the other hand, 10% of wealthier biparental households had 7.6 and 2.8 times more income than the poorest 10% and 50% on this family group, respectively. In single-mother households, that ratio was similar, as the richest 10% received 8.5 and 2.3 times more income than the poorest 10% and 50%, respectively.

6. Conclusion

Using a measure of household income that takes into account the economies of scale in consumption we did not find significant differences in the earnings perceived between single-mother and biparental families. Similarly, the rates of economic dependency did not suggest important disparities in the economic burden for working members in both households.

On the other hand, there was a greater participation of men in the labor market, while women tend to work fewer hours. With lack of sufficient public childcare supply, married women and single-mothers in the active work force have greater time constrains. This situation advices for the development of public policies that provide more nurseries in order to balance the work-family binomial, but also for policies that encourage men to properly address their household responsibilities.

Average schooling and overall educational attainments were higher for both single mother and their children. Women displayed the highest schooling insertion and attendance rates, while people in rural areas showed significantly lower educational levels. Due to the educational gap between urban and rural areas, the State should prioritize the formation of teachers and the provision of school supplies in rural communities.

When analyzing poverty under different optics, the results showed that households led by men were consistently poorer than single mother and biparental families headed by women. This fact can be explained as a cultural factor associated with secondary poverty in male-headed households, which has to do with men caring less for nutrition and schooling, while often maintaining more than one household or spending money on leisure for their own.

[14] Same as the national income Gini calculated by INIDE (2011).

Thus, despite social limitations, our evidence reflects the resilience and audacity single mothers develop in face of daily life challenges.

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III. ARTICLE 2: NICARAGUA: MULTIDIMENSIONAL POVERTY ASSESSMENT FOR SINGLE-MOTHER AND BIPARENTAL HOUSEHOLDS.

1. Abstract

The recognition of poverty as a multidimensional concept has led to the development of more adequate tools for its identification. By allowing for subgroup decompositions, those instruments are useful to allocate public action where it is needed. In this article we applied the Alkire-Foster (2011) multidimensional poverty methodology to study single-mother and biparental families in Nicaragua, using the last Demographic and Health Survey (DHS 2011/2012). The aim was to test the hypothesis that families headed by women are poorer than those headed by men. Within the Alkire-Foster methodology, we adopted the Global Multidimensional Poverty Index (MPI) developed by Alkire and Santos (2010, 2013), modifying its original structure to match more closely with some of Nicaragua's present structural problems. When analyzing multidimensional poverty for different thresholds, we found poverty dominance of male-led families over single-mother and female-led biparental families. On the other hand, despite being less multidimensionally poor than male-led families, single mothers and their children suffer from the same deprivations as other family groups. Within the MPI, the most important contributor was the Living Standards dimension, composed by indicators directly related to housing conditions, and the second most deprived dimension was Education. This reflects the need for governmental policies directed to reduce Nicaragua's housing and educational deficit as a priority, particularly in rural areas.

2. Introduction

Agreeing with Chant's observation that poor men household heads are as vulnerable as women heads, the common assumption of the overrepresentation of women in the universe of the poor should be revised (CHANT, 2007, 2008). In this sense, there is a need for analytical tools that allow correct poverty identification and subgroup decomposition among poor people, in order to make better use of anti-poverty strategy resources.

The popularization of the concept of poverty in economic literature came after decades of high growth and capital concentration that started with the Keynesian revolution following the end of World War II (SNOWDON; VANE, 2005). This interest was driven by the slow worldwide progress on the international human rights enshrined in the 1948's Declaration of Human Rights (SANTOS, 2010).

In this context, most scholars acknowledged the severe limitations of the indirect poverty line method to identify the poor. Those who defended a more holistic conception of human life and needs were the first to point out the shortfalls of the income/consumption line approach. For them, humans needs are not only physical (REIN, 1970; TOWNSEND, 1954, 1979), but also social, and even physical needs are subject to social determinism like dietary customs (TOWNSEND, 2006). In a Latin-American perspective, Max-Neef et al. (1994) suggest that poverty be referred in the plural tense: poverties, because each unmet basic need creates a human poverty, whether of subsistence, protection, affection, knowledge, participation, among others. Namely, meaning that poverty is a multidimensional phenomenon, not limited to the economic sphere, reaching other subjective dimensions according to social needs.

From a more methodological point of view, and following Sen's (1976) original remarks, Alkire and Foster (2009, p. 78) point that "counting as poor only those who are deprived in terms of consumption can result in omitting a significant proportion of poor people in some areas and in over-reporting poverty in others".

Additionally, considering poverty in its many dimensions is critical because it avoids relating it exclusively to income —which tends to over-represent female poverty due to the gender wage gaps— and allows for it to be understood as a restriction of options and opportunities (SEN, 1999a, 2003; ECLAC, 2004; RODENBERG, 2004; ROBEYNS, 2005; CHANT, 2008). Still, in economies with structural labor market problems, monetary income is not necessarily a source of well-being, especially if analysis does not take into account the "forms, areas and sectors where workers are inserted into" (TREJOS, 2008, p.47).

Despite the widespread criticism to the indirect approach of measuring poverty, the income/consumption poverty line is still the predominant international poverty measure. However, in recent decades the use of multidimensional deprivation measures has risen, with important contributions to strengthen antipoverty programs (CALVA; JUÁREZ, 2009; DENIS; GALLEGOS; SANHUEZA, 2010; ALKIRE; SANTOS, 2010, 2013; BUTHAN, 2012; BATTISTON et al., 2013).

If traditional poverty line measures cannot grasp the multiple deprivations that concern human poverty, other more broad measures should be employed. In this sense, our purpose was to expand on a multidimensional poverty method that allows for group decompositions, applying it to study the deprivations suffered by single mother and biparental families in

Nicaragua. The main objective was to validate the notion of families headed by women being poorer than families headed by men. Specifically, we aimed at understanding the dimensional differences of poverty among Nicaragua's most representative family arrangements. The article is divided as follows: section 3 reviews the historical approaches to poverty measurement used in Latin America and introduces the Alkire-Foster multidimensional poverty index, section 4 presents our multidimensional poverty estimates for the family groups under study, and section 5 reports our concluding remarks.

3. Literature review

3.1 A Latin-American precursor: The Basic Needs Approach

In order to provide for a better poverty identification tool, the World Bank started to promote a new methodology, known as the Basic Needs Approach (BNA). Unmet Basic Needs are privations associated or directly related to precarious living standards, divided into 4 dimensions: Access to Housing, Access to Health Care, Access to Education, and Economic Capacity. To classify a family as poor, this method differentiates dichotomously among households with at least one unmet need and those without critical deficiencies, previously establishing threshold values for each dimension. (See: Hicks & Streeten, 1979; P Streeten, 1979; Paul Streeten, Burki, Haq, Hicks, & Stewart, 1981; Paul Streeten, 1984).

This new technique was well received by the critics of the simplistic consumption or income poverty line approach. In fact, for some authors, they are complementary methods, as the poverty line approach identifies the "new poor"; while the basic needs approach recognizes the structural factors behind poverty (BOLTVINIK, 1990; FERES; MANCERO, 2001).

The Economic Commission for Latin America and the Caribbean (ECLAC) introduced the BNA approach in the mid 1980's as a direct way of measuring poverty with census data, turning the region a pioneer in multidimensional poverty measurements (FERES; MANCERO, 2001; BOLTVINIK, 2013). In the next decades, its use was widespread in Latin American countries, and it served as an important basis to develop poverty maps.

As expressed in the Cocoyec Declaration (UNEP/UNCTAD, 1974), the Latin-American basic needs consensus already considered the complexity of conceptualizing poverty. Nevertheless, this consensus, in practice conformed primarily by regional economic institutions and national statistics institutes, already recognized the limitations within the BNA, but held it as the better choice for available data.

There were several technical issues in the historical development of the Latin-American BNA. First, by prioritizing dimensions highly correlated with income it lost temporal consistency, in so far the critical values or thresholds were altered along with progress in some dimensions, besides neglecting or including indicators weakly or strongly correlated with a particular basic need. Another weakness is that in many cases it underestimates urban poverty by defining satisfaction thresholds for rural areas (that have poorer conditions), which impedes a proper comparison and disaggregation between regions and groups. Furthermore, there were no methodological updates benefitting from the new household surveys created in the 1990s (FERES; MANCERO, 2001; SANTOS, 2010).

Finally, the most profound criticism comes from the authors of the human capability approach, indicating that the BNA excludes preference formation mechanisms, social influences and individual conversion factors to define the dimensions of human satisfaction (ROBEYNS, 2005). For Alkire, the NBA went from focusing on the real satisfaction of the basic needs of men to a resource-access centered approach (ALKIRE, 2005). For this reason, the Alkire-Foster multidimensional poverty methodology was used in this study, as introduced in the next section.

2.2 The Alkire-Foster Methodology

The Alkire-Foster multidimensional poverty analysis (ALKIRE; FOSTER, 2007, 2011) relates to a broader branch of developmental studies under the human capability approach (ROBEYNS, 2005). This approach finds its philosophical foundation in Amartya Sen's work, having its focus on functionings, described as "the various things a person may value doing or being" (SEN, 1999a, p. 75). Sen understands human development as the expansion of the vector of functionings that allows people to carry out the kind of lives they value the most. In the context of poverty analysis, this translates as, for example, expanding the capacities for people to be well nourished or well sheltered (SEN, 1999b, 2003).

The Alkire-Foster (AF) method has two main advantages, which makes it a powerful tool for the development of focalized poverty policies. First, it is adaptable to different settings and purposes, allowing for international, national, or regional comparisons. It is also decomposable, meaning that it can be broken down to identify which individual indicators are most responsible for adding to the multidimensional poverty measure (ALKIRE; FOSTER, 2009, 2011).

These advantages have made the AF methodology earn the confidence of policy makers in different Latin-American countries. As for now, and besides the more academic explorations, four official multidimensional poverty measures adopt the AF method in the region. The first national initiative was developed by the Mexican government through its National Council for Evaluation of Social Policy (CONEVAL), a national institute created in 2006 to guarantee social and economic rights (CONEVAL, 2010).

The second national multidimensional poverty measure was undertaken by Colombia's Department of National Planning, and, since 2012, it has been used to monitor conditional cash transfer programs (OPHI, 2013). Funded by Luxemburg, the government of El Salvador started designing its own multidimensional poverty measure in 2011, with the purpose of guiding social policy (OPHI, 2013). In Brazil, since 2012, the State Government of Minas Gerais has used the AF poverty measure to monitor its Travessia poverty reduction strategy, reaching 132 of its municipalities up to date (OPHI, 2013).

Being a two stage technique, the AF multidimensional poverty index identifies a person as deprived if its achievements in a particular dimension do not satisfy the critical chosen value for that dimension, but only calls a person poor in accordance with its conjunct distribution of deprivations. In other words, this methodology first sets an individual's (i=1,….,n) poverty line (z_{ij}) for each dimension (j=1,….,d), to latter establish the number of dimensions (k cutoff) a person needs to be deprived of in order to be classified as multidimensionally poor (ALKIRE; FOSTER, 2011). For example, a person may be deprived of the dimension 'nutrition' if its Body Mass Index (BMI) is below 18.5 kg/m^2 ($x_{ij}<z_j$), but will be designated as poor if its weighted deprivation vector (c_i) falls under the second poverty cutoff ($c_i \geq k$).

In the AF methodology, the Multidimensional Poverty Index is a product of the number of poor people (poverty incidence or headcount ratio) and the average proportion of indicators in which poor people are deprived (poverty intensity), expressed as follows:

$$M_0 = MPI = \frac{1}{n}\sum_{i=1}^{n} c_i(k) = H \times A;$$

Where c_i is the deprivation vector, k the poverty cutoff, H the number of poor people, and A the average deprivations among the poor. By taking into account both the incidence and

intensity of poverty the index satisfies dimensional monotonicity[15], once M_0 rises not only as the raw number of poor augments, but also as the intensity of deprivations amid the poor increases.

This method differs from previous multidimensional poverty measures that would classify a person as poor if she/he had suffered from any deprivation —known as union approach—, or if she/he was deprived in all dimensions —interception approach—, for being a dual cut-off approach; that includes both but allows for intermediate poverty identifications. While the union approach (CHAKRAVARTY; MUKHERJEE; RANADE, 1998; TSUI, 2002; BOURGUIGNON; CHAKRAVARTY, 2003) could often predict a high number of poor people, the interception approach (ATKINSON, 2003) could allow for poverty underestimation.

Within the Alkire-Foster methodology, we adopted the Global Multidimensional Poverty Index (MPI) developed by Alkire and Santos (2010, 2013), which has also been used in the UNDP's Human Development Report since 2010. In the same fashion as the Human Development Index (HDI), this MPI uses three dimensions of wellbeing: Health, Education, and Living Standards.

For our study, we adopted the 10 indicators used in the Global MPI, but added two additional indicators in the Living Standards dimension. They correspond to a measure of family overcrowding and house ownership, adding to 12 indicators building the index[16]. Besides that addition, we made minor criteria alterations in the 'years of schooling' and 'assets' indicators (see Table 7).

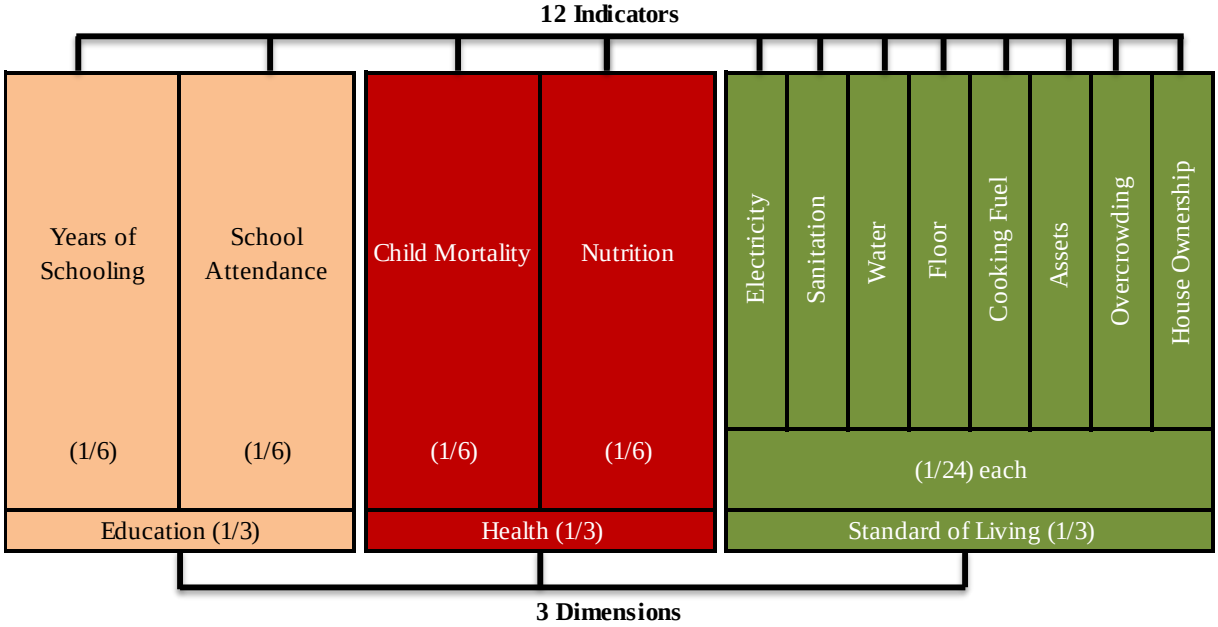
To be consistent with the Global MPI methodology we also adopted the same dimensional weights, assigning a weighting factor of 1/3 to each dimension. In this way, each of the two indicators within Health and Education received a weight of 1/6, while each of the eight indicators in the Living Standards dimension received a weight of 1/24. Using the same poverty cutoff (k) as the Global MPI, the number of people who are multi-dimensionally poor are those deprived in 33.33% or more weighted indicators[17]. Figure 6 illustrates the

[15] For a review of the index's axiomatic properties see Bourguignon & Chakravarty (2003) and Alkire & Foster (2011).

[16] According to the Inter-American Development Bank (2012), 78% of households in Nicaragua have sub-standard housing. The estimated housing deficit rounds 957,000 units, with 348,000 corresponding to the need for new houses and 609,000 for improvement of existing units (INIDE, 2011b).

[17] In our Index that percentage translates to a deprivation cutoff of 4 or more indicators.

composition of the Multidimensional Poverty Index, and Table 7 details each indicator with its weight and deprivation threshold.



Source: Adapted from OPHI (2014), Multidimensional Poverty Index at a Glance. Country Briefing, Nicaragua .

Figure 6: Multidimensional Poverty Index structure.

Table 7. Nicaragua's National MPI: dimensions, indicators and deprivation thresholds

Dimension (weight)	Indicator (weight)	Deprivation criteria, deprived if...
Education (1/3)	Child School Attendance (1/6)	Any school-aged child (6-14 years) in the household is not attending school up to class 6.
	Years of Schooling (1/6)	No household member has completed six years of schooling.
Health (1/3)	Child Mortality (1/6)	Any child has died in the family.
	Nutrition (1/6)*	Any adult or child for whom there is nutritional information is malnourished.
Living Standard (1/3)	Electricity (1/24)	The household has no electricity.
	Improved Sanitation (1/24)**	The household's sanitation facility is not improved.
	Safe Drinking Water (1/24)***	The household does not have access to safe drinking water or safe drinking water is more than a 30-minute walk from home, roundtrip.
	Flooring (1/24)	The household has a dirt, sand or dung floor.
	Cooking Fuel (1/24)	The household cooks with dung, wood or charcoal.
	Assets (1/24)****	The household does not own more than three basic assets.
	Overcrowding (1/24)	The household has more than 4 people per sleeping room
	House Ownership (1/24)	The household does not have the property's scripture, borrows the house, are allowed to live in exchange of services, or are coaching.

Source: Adapted from OPHI (2014), Multidimensional Poverty Index at a Glance. Country Briefing, Nicaragua .

*Adults are considered malnourished if their BMI is below 18.5 kg/m^2. Children are considered malnourished if their z-score of weight-for-age —measuring undernourishment— is considered as moderate or severe.

**A household is considered to have access to improved sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet.

***A household has access to clean drinking water if the water source is any of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater, and it is within a distance of 30 minutes' roundtrip walk.

****Basic assets considered: radio, sound equipment, TV, refrigerator, stove, microwave, iron, ventilator, washing machine, computer, telephone, cellphone, bicycle or beast.

Data used to build the MPI is Nicaragua's most recent National Demographic and Health Survey (ENDESA or DHS 2011/2012), published in 2013 by the National Institute of Development Information (INIDE, 2013). ENDESA 2011/2012 is composed by a stratified sample of 21,960 households, being representative for Nicaragua's main macro-regions (Pacific, Central, Atlantic) and rural/urban areas.

This survey was chosen due to three main reasons, namely: while incorporating most educational and housing information contained in the EMNV, it has valuable health data not present in the latter. Secondly, it is the official survey used by OPHI for calculating its Global MPI measures. Finally, it brings more up-to-date information on the living conditions of Nicaraguan families, being the most recent official available national survey. That said, it is important to recognize ENDESA 2011/2012 limitations, as it does not provide reliable income, work and other economic indicators.

4. Results and discussion

4.1 Comparing multidimensional poverty between biparental and single-mother families

In the subsequent analysis, multidimensional poverty will be compared among three different family arrangements: single-mother led families, female-led biparental families and male-led biparental families. Single-mother families are defined as families whose chief is a single, divorced or separated woman with at least one child under 18 years of age living with her. In contrast, biparental families are two-parent families with at least one child under 18 years of age living with its mother.

As declared in the introductory remarks, growing up in single-mother families is a recurring phenomenon for Nicaraguan children, once data from ENDESA 2011/2012 shows that only 71.4% of children lived with both biological parents and 8.8% of men declared married or with a stable partner stated having children that did not live with them.

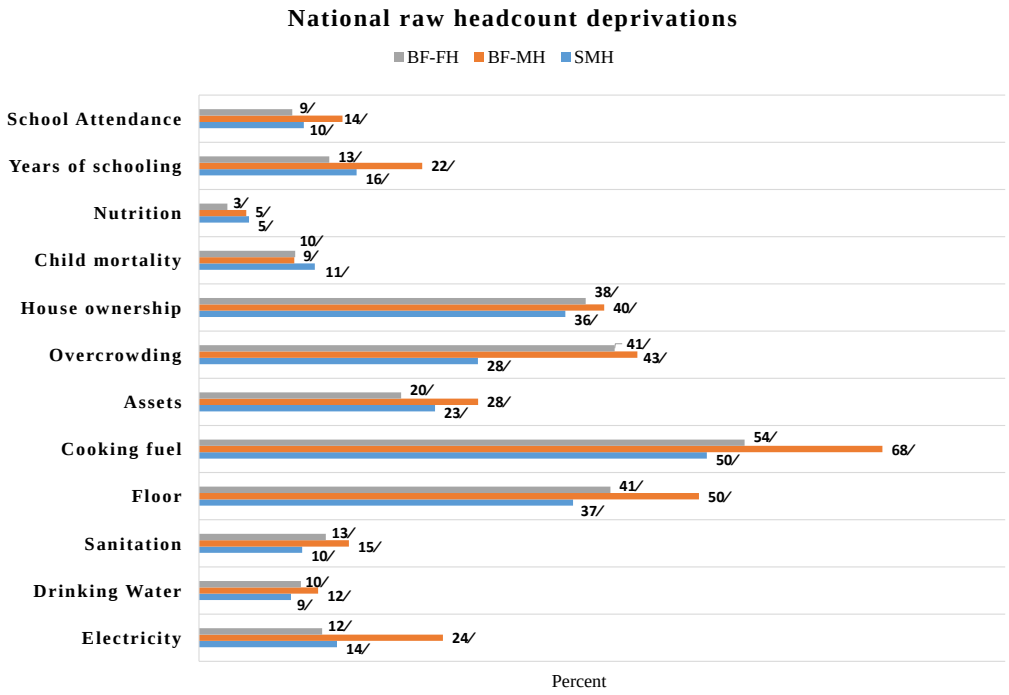
ENDESA 2011/2012 database also shows the existence of a gender disproportion between the number of married/accompanied and separated family heads. On the one hand, men lead most families (66.4%), but the proportion of family heads declared as 'separated' is much higher for women than for men heads, while the share of married/accompanied men heads exceeds that of women. The percentage of family heads declared married or with a stable partner was 87.8% for men and 28.6% for women, while the proportion of separated heads was 6.1% for men and 39.6% for women.

Headship is even smaller for women in rural areas, where women lead 23.2% of families, in contrast with 43.8% in urban areas. As for the specific arrangements under study, female headship is also lower in rural areas, with 63.6% and 61.9% of single-mother families and female-led biparental families living in urban areas, respectively.

In a brief socio-demographic review, it is interesting to notice a similar age for single mothers and male fathers in families with both parents, while both single mothers and female heads in biparental families had higher years of schooling when compared to male heads in families with both parents. The average age for single mothers was 39.7 years, with 40.4 years for male heads and 36.3 years for female heads in biparental families. As for educational attainments, women led with an average of 6.6 years for both single mothers and women leading biparental families, while male chiefs had an average of 5.4 years of schooling. Finally, there is an even distribution on the number of children under 18 years old across all three families, with a median of two children per family.

Before presenting the MPI results, it is important to expand a little on Nicaragua's poverty background. INIDE's (2011a) Unmet Basic Needs estimations, using data from the last National Household Standard of Living Survey (EMVN 2009), showed worrisome levels of households deprived in the following indicators: economic dependence (34.0%), overcrowding (26.7%), basic household services (24.6%), low education (17.4%), and sub-standard housing (10.8%).

Data from ENDESA 2011/2012 also reveals an important proportion of the population deprived in several of the indicators included in our index, especially in the Living Standards dimension. Figure 7 displays the raw national deprivation headcount for all families, not only for those classified as multidimensionally poor; remember that for a household to be poor it needs to be deprived in at least 4 out of 12 indicators (k=33.33%). Households headed by men experienced higher raw deprivations in most indicators, and for all three household arrangements the most generalized deprivations were observed in indicators directly related to housing conditions.



Source: based on data from ENDESA 2011/2012.
BF-MH = Biparental families, male-headed; BF-FM = Biparental families, female-headed; SMH = Single-mother households.

Figure 7: National raw deprivations by indicators.

By means of comparison, it is useful to recall some other poverty measures: official estimates, World Bank's poverty line and OPHI's last Global MPI figures for Nicaragua. Nicaragua's last official consumption poverty estimates informed that 42.5% of the population lived under poverty; 27.9% under general poverty and 14.6% under severe poverty (INIDE, 2011a). The World Bank calculates that 31.7% of Nicaraguans live with less than US$ 2 (PPP) per day, and 11.9% live with less than US$1.25 (PPP) (THE WORLD BANK, 2012). Lastly, OPHI estimates that 16.1% of Nicaraguans are multidimensionally poor, with 5.3% living under sever poverty (k≥50%) (OPHI, 2014).

MPI results show a higher prevalence of poverty in biparental households headed by men, followed by single-mother households and female-led biparental households. Table 8 presents the national and regional MPI results for various poverty measures. With the standard k cutoff of 33.33%, the headcount ratio (H) indicates that 17.2% of single-mother households were multidimensionally poor. For biparental households, poverty incidence was greater for male-headed households (24.5%) than for female-headed households (14.3%). These percentages of poor were statistically different across all three family units.[18]

[18] To contrast mean differences between MPI components across families, we used the Mann-Whitney U test (ranksum test), given the difference in sample sizes between the three family groups under scrutiny (HAMILTON, 2006, CORDER; FOREMAN, 2009, ACOCK, 2010).

The average intensity of deprivations (A) indicates that among the poor, all three family arrangements were deprived, on average, in 45% of indicators. Using a higher poverty cutoff (k≥50%) to portray severe poverty, we found more acute poverty conditions in biparental households headed by men; no statistical difference was found in severe poverty between households headed by women.

Finally, the Multidimensional Poverty Index was 0.078 for single mother households, meaning that poor single-mother households in Nicaragua experienced approximately 1/13 of the deprivations that would be experienced if all single-mother households were deprived in all indicators. The MPI was again higher for biparental households headed by men (0.112), and lower for biparental households headed by women (0.064), with a statistical MPI difference amongst all three family units. This evidence suggests the underlying existence of secondary poverty in biparental households, a phenomenon still not profoundly studied by traditional poverty evaluations.

Table 8. Nicaragua: Multidimensional Poverty Across Households and Regions

Poverty measures	Single-mother	Biparental-male headed	Biparental-female headed	National (all households)
MPI Index (H x A)				
National	**0.078**	**0.112**	**0.064**	**0.086**
Urban	0.033	0.019	0.023	0.021
Rural	0.160	0.174	0.134	0.157
H (Incidence) k ≥ 33.3%				
National	**17.2**	**24.5**	**14.3**	**19.0**
Urban	7.6	4.6	5.2	4.9
Rural	34.7	37.6	29.4	34.4
A (Intensity)				
National	**45.5**	**45.9**	**45.0**	**45.1**
Urban	44.0	42.4	43.4	42.1
Rural	46.0	46.2	45.5	45.5
Severe Poverty (k ≥ 50%)				
National	**6.0**	**8.6**	**5.1**	**6.2**
Urban	2.2	1.1	1.7	1.1
Rural	12.7	13.6	10.8	11.8

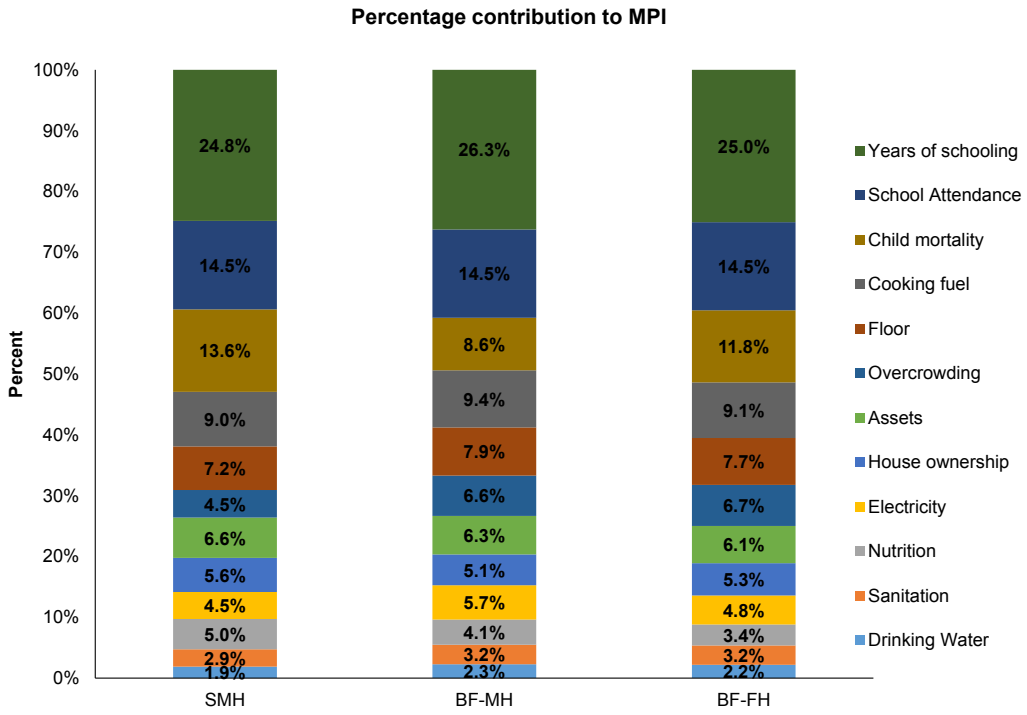
Source: Based on data from ENDESA 2011/2012.

Table 8 ratifies the rural bias for poverty in Nicaragua, as the percentage of poor and severely poor households is several times higher for rural areas. In single-mother and women-led biparental households the percentage of the rural poor more than doubles the national poor estimates. At the national level, the regional participation shows that the rural poor contribute to 87.4% of total MPI. For single-mother households the rural poor explained 72.7% of total

MPI, with 93.2% and 78.1% for male-headed and female-headed households with both parents, respectively.

Once we determined poverty levels for each household under study, it is useful to identify which dimension adds more to poverty. Figure 8 illustrates the percentage contribution of each deprivation indicator on the overall MPI. As exemplified in Figure 8, the two single biggest indicators adding to the MPI come from the Educational dimension.

However, when counting the total dimensional contribution, the Living Standards dimension is the most important MPI component in all households. In the case of single mothers, while the two indicators under Education amount to 39.3% of total MPI, the Living Standards represented 42.1% of total MPI. The other two households follow a similar structure.



Source: based on data from ENDESA 2011/2012.
BF-MH = Biparental families, male-headed; BF-FM = Biparental families, female-headed; SMH = Single-mother households.

Figure 8: Multidimensional Poverty Index percentage composition.

Under Education, the main indicator is years of schooling, representing about 1/4 of total MPI for all three households. It is also worth mentioning that child mortality is a leading deprivation indicator for single mothers (13.6%) and biparental households headed by women (11.8%). Being one of the most generalized deprivations, cooking fuel is the chief contributor in the Living Standards dimension.

For households integrating the index we can examine the censored headcount ratio, which represents the proportion of population residing in multidimensionally poor households and who are also deprived in that indicator. Figure 9 confirms —for most indicators— that poor biparental households headed by men are the most deprived. For all three household types, cooking fuel, floor and overcrowding stand as the most generalized deprivations, with nutrition, drinking water, sanitation and child mortality as the less common deprivations.

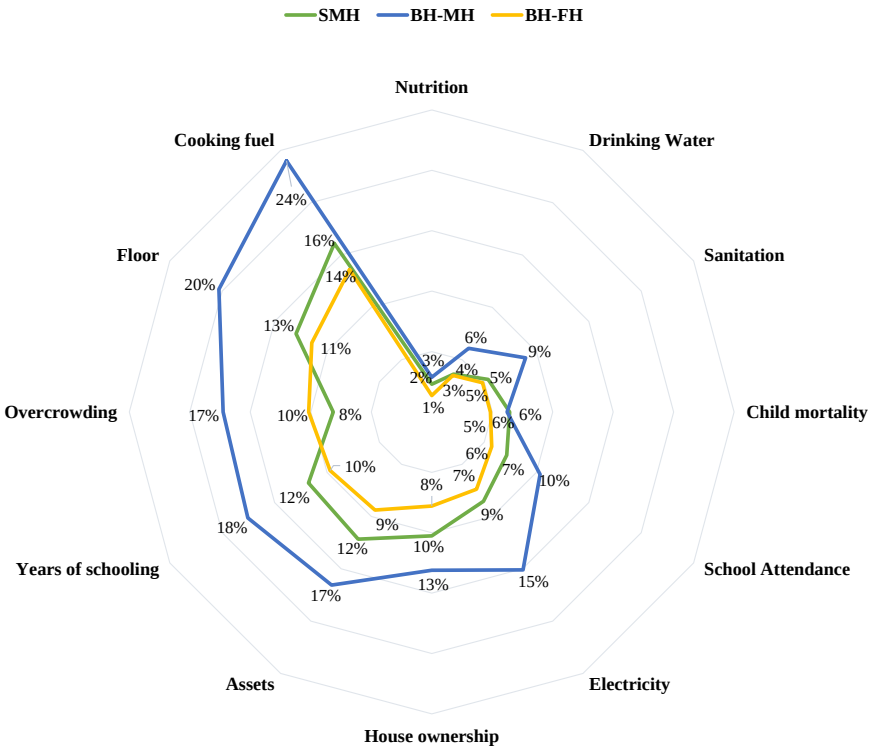
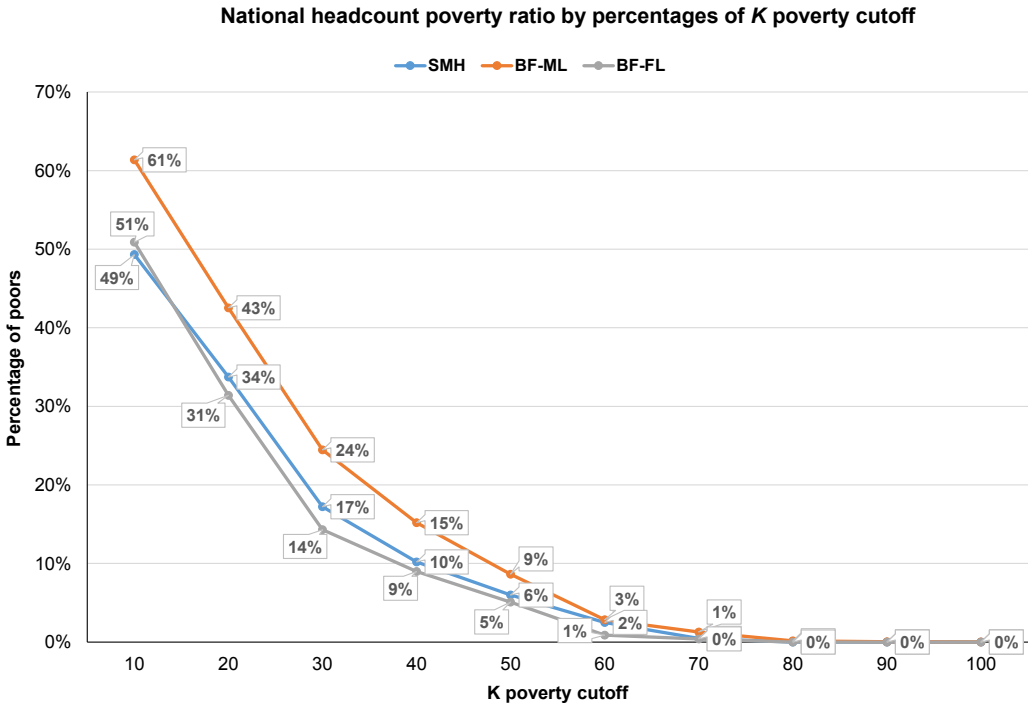


Figure 9: National censored deprivations by indicator.
Source: based on data from ENDESA 2011/2012.
Notes: BH-MH = Biparental households, male-headed; BH-FM = Biparental households, female-headed; SMH = Single-mother households.

Considering that the Global MPI axiomatic properties allow deprivations to be observed at different poverty k cutoffs, Figure 10 presents the national multidimensional poverty incidence at different poverty thresholds.



Source: based on data from ENDESA 2011/2012.
BF-MH = Biparental families, male-headed; BF-FM = Biparental families, female-headed; SMH = Single-mother households.

Figure 10: National headcount ratio by percentages of k cutoff.

The national poverty headcount exemplified in Figure 10 corroborates the poverty dominance of male-headed households, because these households display higher poverty ratios for all k levels. Between female-led households, and for most poverty cutoffs, there was no statistical difference in the occurrence of multidimensional poverty.

5. Conclusion

Our national multidimensional poverty index estimated for Nicaragua greatly contrasts with the simpler poverty line estimates. This means that income poverty overestimates the number of poor people when compared to the poor identified by a multidimensional approach. That confirms the more holistic nature of poverty, viewed as the deprivation of various aspects of human life.

In this study, multidimensional poverty analysis found poverty dominance of male-led families over single-mother and female-led biparental families. Within MPI, the most important contributor was the Living Standards dimension, especially in indicators directly related to housing conditions; the second most deprived dimension being Education. This reflects the need for governmental policies directed to reduce Nicaragua's housing and educational deficit as a priority, particularly in rural areas.

Despite being less multidimensionally poor than male-led families, single mothers and their children suffer from the same deprivations as other family groups. In the child mortality indicator, for example, single mothers lead with higher deprivation rates. This could imply that they are subject to more stress during pregnancy, when compared to biparental women. Similarly, the patterns of headcount deprivations showed that for most indicators single-mother households were poorer than biparental households led by women.

The findings of male-led families being consistently poorer than single-mother and biparental families can be explained as a cultural factor known as secondary poverty. That is, in male-led households the chiefs often care less for children's nutrition or schooling, while sustaining other household or spending money on leisure for themselves. This scenario calls for better long-run politics regarding early pregnancy and men's vacant role as parents. It also shows the need of qualitative research on the matter, in order to understand the relational poverty that arises within different family structures.

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IV. ARTICLE 3: INCOME INEQUALITY AND INTERGENERATIONAL ECONOMIC MOBILITY ACROSS FAMILIES IN NICARAGUA

1. Abstract

There is a hypothesis that women are more economically vulnerable than men, with lower wages and overall less labor market opportunities. That perception is frequently extended to presume a higher intergenerational poverty transmission for families headed by single women. Economic and social mobility is a subject studied by social scientists from different approaches and for different reasons. To understand the patterns of economic mobility in a developing country this article uses Nicaragua's most representative family arrays to estimate the intergenerational earnings elasticity between parents and offspring. Besides calculating the intergenerational earnings' elasticity coefficient through an Instrumental Variables Two Stage Least Squares (IV2SLS) estimator, this article experiments with some other economic mobility tools. Our findings reveal a high income persistence for Nicaragua, with a beta coefficient within the range of other Latin-American studies, and higher than the less mobile developed countries. In contrast, income analysis revealed a narrowing gender wage gap over the past decade. Due to the high concentration of income in the upper quintiles, a recommendation for social policy is for government to implement tax reforms aimed at reducing income inequality.

2. Introduction

One line of thought in the study of family relations and financially vulnerable families states that single parents, lacking their partner's support, invest less in children's human capital, limiting their future prospects (MCLANAHAN, 2004; RICH; GARFINKEL; GAO, 2007). In the case of single mother's employment perspectives, it is expected for them to have fewer labor market contacts in comparison to biparental cohorts, being one of the main groups at risk of low income.

Occupational mobility studies suggest that in single-mother families, the husband's absence causes a loss of weak ties that limits the mother's social network capacity (informational availability) to find job (NEWMAN; GRANOVETTER, 1996; CORRELL et al., 2007). This hypothesis is not parsimonious, even more as we recognize that male majorities weave labor market's nets. In the United States, for example, Loury (2006) estimates that about half of jobs are found through family, friends and acquaintances.

Labor market connections also matter for children's future economic opportunities as an important share of progenies involve in similar economic activities as their parents (HELLERSTEIN; MORRILL, 2011). There are a great number of methods for measuring economic and occupational mobility, which vary according to specific objectives and disciplinary paradigms.

Economic and social mobility is a subject studied by social scientists –and by geneticists– from different approaches and for different reasons. Economists have analyzed the causal relation between father-son[19] earnings and income ranking since late back 1970's in the United States (BECKER; TOMES, 1979). However, over the last two decades these studies have grown in number and sophistication due to the availability of more suitable data and methods for its estimations (GRAWE, 2004a; TORCHE, 2013; CORAK, 2013).

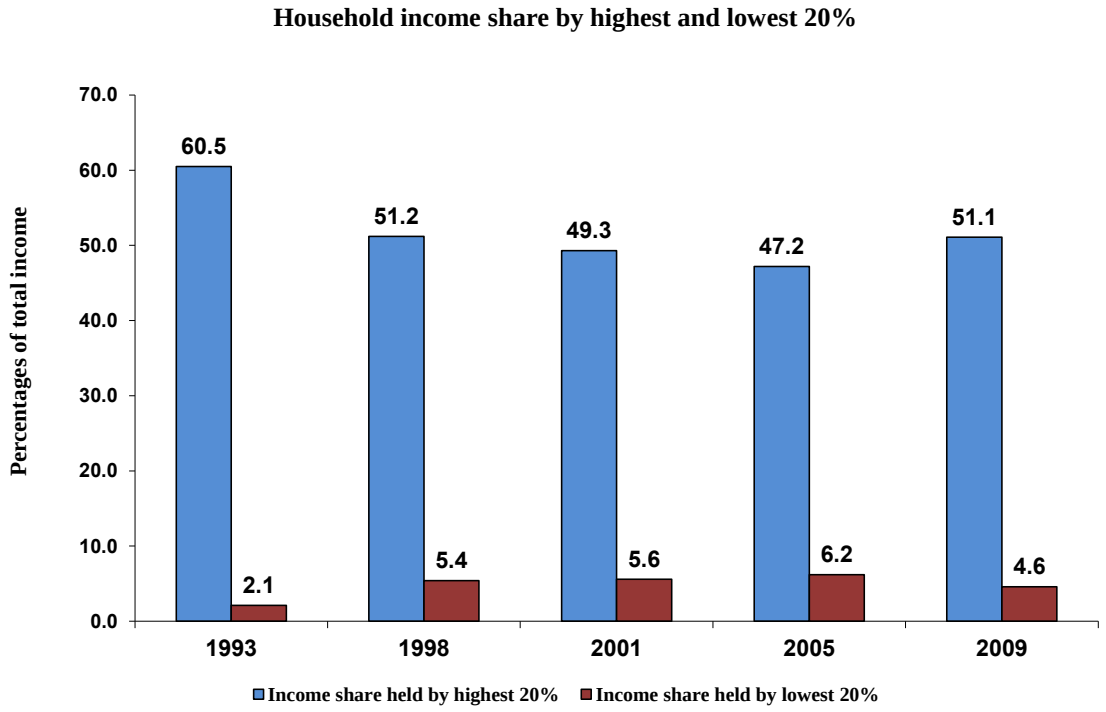
On the other hand, sociologists, with a longer history studying social mobility, have concentrated on the occupational mobility between fathers and sons. Their studies of occupational correlations range from analyzing welfare poverty traps in poor neighborhood to intergenerational transmission of attitudes (SEWELL et al., 1970; SEWELL et al., 1980; HAUSER; SEWELL, 1986; KORUPP et al., 2002).

Geneticists have studied the transmission of Intelligence Quotient scores (IQ) and other measures of intelligence and capabilities. In this case, while some research (BJÖRKLUND; JÄNTTI, 2009) finds the genetic component to be of great significance in explaining the persistence of income among parents and progeny, other studies call for caution as the real role of genes/environment in social mobility is still not fully understood (DURLAUF; SHAOSHADZE, 2014).

This research focuses on the intergenerational earnings elasticity, more in line with the economic point of view of the first group of scientists. By focusing on Nicaragua, this inquire can contribute to the evidence that explains the positive relation between inequality and the lack of economic mobility. In fact, as will be seen later on, our income elasticity estimates are in line with the "Great Gatsby curve" argument that societies that are more unequal tend to have lower income mobility (CORAK, 2013).

[19] Most of this literature is male-oriented, arguing the statistical noise (and lack of international comparability) from including women in societies with significant gender wage gaps and overall social discriminations against women. For studies including women see Schwenkenberg (2014) and Chadwick and Solon (2002) for the United States, and Kan, Li, and Wang (2014) for Taiwan.

In Nicaragua, inequality had a slow descend during the last two decades, as officially measured by the Gini coefficient. However, income and consumption distribution remains highly concentrated in the upper quintile[20]. To illustrate that concentration of wealth, Figure 11 displays the income share of the 20% poorest and richest households for the period of 1993 to 2009.



Source: The World Bank: World Develpment Indicators.

Figure 11: Income share of poorest and richest.

As seen in Figure 11, the last national household survey shows that in 2009 the richest 20% of Nicaraguan households received more than half the national income. This scenario demonstrates the importance of understanding the patterns of economic mobility, as a high persistence of income between parents and offspring would keep reproducing that concentration of wealth.

The main objective of this article was to contrast earnings' elasticity between the two most representative household arrangements in Nicaragua –single-mother and biparental families–, in order to understand the patterns of economic mobility in a developing country. The specific objectives study the underlying factors of inequality, by using alternative measures of income and occupational mobility.

[20] The decrease in Gini estimates has been driven mainly by the reduction of poverty and extreme poverty in the lowest quintile, while other more broad sources of inequality have also been reduced, as health and housing programs bettered some of the poor's living conditions.

3. Methodology

Following Solon's theoretical specification, the main measure for intergenerational earnings elasticity is taken from the beta coefficient in equation 1.1 (SOLON, 1992). This log-log elasticity coefficient is higher (closer to 1) for low-mobility societies and lower (closer to 0) for countries with higher mobility[21].

$$Y_{it} = \propto + \beta Y_{it-1} + \varepsilon_t \qquad \textbf{(1.1)}$$

Where Y_{it} represents offspring's' log income as a function of their parents log income, expressed by Y_{it-1}, and ε_t is the error term. To exemplify, a common interpretation would be that in an economy with a β_1 coefficient of 0.5, parents with an income 10% below (above) average will have offspring with an income 5% below (above) average. Even when this measure of economic mobility does not indicate the direction of that intergenerational transition, i.e. upward or downward, it gives an idea of the capacity a society has to transform its actual income distribution.

Most studies are from developed countries and use longitudinal survey data that monitor families' revenue across generations. These sources of data include The Michigan Panel Study of Income Dynamics (PSID), the Canadian Intergenerational Income Data (CIID) and the German Socio-Economic Panel (GSEP). With the lack of such data for underdeveloped countries, authors have used instrumental variables, quantile regressions and transition matrices among quintiles from various national household surveys. Due to these restrictions, few studies have attempted to estimate the Intergenerational Earnings Elasticity (IEE) with samples with co-residing parents and offspring. Some examples include Hertz (2001) for South Africa, Mendoza and Narváez (2013) for Nicaragua, and Grawe (2004a) for Ecuador, Nepal, Pakistan and Peru.

Other intergenerational income elasticity estimates for developing countries include 0.62-0.68 for South Africa (PIRAINO, 2014) using four different model specifications; 0.54-0.75 for Brazil (GUIMARAES FERREIRA; VELOSO, 2006) depending on regional and racial controls; 0.57-0.74 for Chile (NUNEZ; MIRANDA, 2010); 0.18-0.54 for Taiwan, in function of parent-offspring's sex pairs; and 0.29-0.479 for Nicaragua, using three model

[21] The intergenerational persistence of income is different from equality of opportunity in that equality of opportunity makes a distinction between the factors individuals control (efforts) and those they can't (gender, race) (PIRAINO, 2014). The persistence (mobility) coefficient, on the other hand, is then an estimate of results in face of uncontrollable factors, and not of the mechanisms underlying social mobility (DURLAUF; SHAOSHADZE, 2014).

specifications (MENDOZA; NARVÁEZ, 2013). See Figure 2, in Azevedo and Bouillon (2010), for a graphical comparison of intergenerational income elasticity between developed and developing countries.

With co-habitation data, there is the possibility of family heads' income being an endogenous variable, due to selection bias. For example, rich children probably have more choices and opportunities in relation to the poorest. Since the heads' income may be correlated with their past human capital dotation, our explanatory variable is contained as a lag in equation 1.2:

$$Y_{it-1} = \propto + \beta Y_{it-2} + \varepsilon_{t-1} \quad \textbf{(1.2)}$$

As expressed by Solon (1992), this type of measurement error reduces the elasticity's estimates. To have better estimates we pooled data from Nicaragua's most recent three national household surveys to run Instrumental Variables Two Stage Least Squares (IV2SLS). It is important to acknowledge that in theory, IV2SLS may produce what could be the upper bound of the real elasticity coefficient (GRAWE, 2004a; TORCHE, 2013; PIRAINO, 2014).

The IV2SLS estimator requires instrumental variables that are both uncorrelated with errors and preferably highly correlated with the instrumented (WOOLDRIDGE, 2002). With longitudinal datasets from developed countries, Grawe (2004) demonstrated how intergenerational earnings persistence estimates are strongly sensitive to the age at which earnings are measured (elasticity increases with son's age and decreases with father's). In order to avoid that life-cycle bias we instrument the heads' income using their education, age and age squared. Thus, our two-stage estimator is defined by the simultaneous equations:

$$Y_{it-1} = \pi_0 + \pi_1 age_i + \pi_2 age\hat{}2_i + \pi_3 educ_i + \varepsilon_i \quad \textbf{(2.1)}$$

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 age_i + \beta_3 age\hat{}2_i + \beta_4 year_i + \mu_i \quad \textbf{(2.2)}$$

Where equation 2.1 correspond to the head's earnings estimate and 2.2 is our basic intergenerational income elasticity equation, with β_1 as our persistence coefficient. Following the theoretical model introduced in Solon's 1992 seminal paper and taking into account improvements drawn from more recent empirical studies, we allow for different specifications, controlling for other explanatory and instrumental variables, with the inclusion of a dummy to account for each sample year.

For one of our estimates variations we use the same proxy of housing price used in Mendoza and Narváez (2013), taken from what the families responded to be the average rent

paid, or that would have (hypothetically) to pay for the case of house owners. Intuitively, this instrument could be correlated with family heads' long-run income, under the assumption that they will buy or rent better houses as a function of their permanent income's expectations.

Before presenting the elasticity estimates in section 4.2, section 3.1 introduces the data samples and section 4.1 briefly addresses the factors commonly associated with lack of mobility in Nicaragua.

3.1 Sample selection and descriptive statistics

To calculate our estimates of earnings persistence across generations, we pool data from Nicaragua's three last national household surveys: 2001, 2005 and 2009 National Household Survey of Living Standard Measurement (EMNV, for its acronym in Spanish). They are nationally representative Living Standard Surveys conducted by the National Institute of Statistics (INEC for the 2001 and 2005 surveys, and INIDE for 2009).

Our samples include single-mother and biparental families with adult children only (restricted for offspring's age to range from 18 to 45 years old). According to this classification, 8.2% of families where led by a single mother in the EMNV 2001 sample, 10.0% for the EMNV 2005, and 9.3% for the EMNV 2009. This confirms singlemotherhood as a persistent phenomenon among Nicaragua families.

Primary annual wage, that also includes primary earnings for cooperatives and business, was used to calculate the elasticity estimates. While Mendoza & Narváez (2013) used people who had been on the same job for at least 4 months from the week of the interview, we use a more flexible and common restriction (GRAWE, 2004a), that respondents must report positive earnings to be included in the sample. For observations where the head's earnings were null or absent, we imputed the companion's earnings as a substitute, when available.

4. Results and discussion

4.1 Factors that influence economic mobility

This section focuses on two key dimensions related to the intergenerational income elasticity: wage and labor market. We first analyze income among working adults, to then classify them into occupational categories according to their wage, working hours and educational levels.

In all samples, family heads received better wages than their progenies, as summarized by Table 9. That difference, however, was mainly due to age differences, as there was no statistical wage disparity among heads and offspring of the same age. On the other hand, female and male offspring had statistically equal wages, with a small nominal advantage for men. No family-type difference was found between offspring's earnings in all samples.

Table 9: Wage information for working adults

EMNV-2001	N = 1,165						
	SMH heads	SMH offspring		Biparental heads		Biparental offspring	
Descriptive Statistics	Women	Men	Women	Men	Women	Men	Women
Median annual wage*	912	1,216	988	1,216	1,368	1,457	886
EMNV-2005	N = 2,425						
	SMH heads	SMH offspring		Biparental heads		Biparental offspring	
Descriptive Statistics	Women	Men	Women	Men	Women	Men	Women
Median annual wage*	950	1,249	1,171	1,280	1,249	937	1,008
EMNV-2009	N = 886						
	SMH heads	SMH offspring		Biparental heads		Biparental offspring	
Descriptive Statistics	Women	Men	Women	Men	Women	Men	Women
Median annual wage*	1,683	1,450	1,321	1,554	1,804	1,243	1,234

Notes: Author's tabulations from EMNV (2001, 2005, 2009) using survey weights.
*U.S. dollars of 2006.

In the 2005 sample, the gender wage gap was larger and statistically significant for family heads, with women receiving 68.6% of men's annual primary earnings (60.7% on the 2001 sample). This evidence could suggest that the gender wage gap narrowed for the younger generation. In the 2009 sample there was no statistical gender wage gap between family heads, reinforcing the possibility of a narrowing wage gap through time. There was also no evidence of a wage gap between heads from our two family arrangements.

Following Schwenkenberg (2014), work-related categories were created to identify the types of job taken by men and women from both households. In addition, we add a new proxy category to represent Nicaragua's underemployment issues[22]. Thence, our first job set, 'low-return', is an occupation characterized by above median working hours and years of schooling, but paying below median annual wage. In second place, a 'low-skill' category has below median education and wage, but above median working hours. The third category, 'flexible', denotes a job with above median education and earnings, and below median working hours. Finally, 'underemployed' refers to an occupation with below median wage,

[22] Underemployment is considered Nicaragua's main labor market problem (DE FRANCO, 2011; MENDOZA TIJERINO; ALTAMIRANO MONTOYA, 2013; AVENDAÑO, 2014). According to Nicaragua's Central Bank (BCN, 2014) in 2013 Invisible and Visible underemployment affected 48% of its employed labor force.

education and working hours. The participation percentages of working adults in each category are displayed in Table 10.

Table 10: Occupational categories by gender

EMNV-2001							
Occupational Category	SMH heads	SMH offspring		Biparental heads		Biparental offspring	
	Women	Men	Women	Men	Women	Men	Women
Low-return	5.0%	6.1%	9.7%	2.4%	5.9%	6.1%	25.4%
Low-skill	5.0%	4.5%	1.5%	7.9%	0.0%	6.6%	2.8%
Flexible	13.3%	27.8%	30.3%	8.4%	17.5%	22.2%	23.9%
Underemployed	14.8%	4.5%	1.9%	14.1%	10.2%	11.1%	2.5%
EMNV-2005							
Occupational Category	SMH heads	SMH offspring		Biparental heads		Biparental offspring	
	Women	Men	Women	Men	Women	Men	Women
Low-return	6.0%	6.7%	9.0%	2.7%	8.4%	12.2%	11.9%
Low-skill	8.1%	3.6%	1.9%	8.4%	3.9%	3.4%	4.7%
Flexible	15.8%	15.7%	26.2%	8.7%	9.7%	22.0%	25.1%
Underemployed	13.4%	2.1%	1.6%	13.5%	8.2%	9.6%	4.3%
EMNV-2009							
Occupational Category	SMH heads	SMH offspring		Biparental heads		Biparental offspring	
	Women	Men	Women	Men	Women	Men	Women
Low-return	1.7%	8.7%	1.8%	2.1%	3.3%	7.2%	20.3%
Low-skill	6.3%	9.2%	6.2%	9.6%	2.7%	4.9%	5.3%
Flexible	11.5%	25.8%	29.9%	9.2%	20.9%	11.6%	20.5%
Underemployed	2.8%	6.3%	2.3%	13.2%	8.6%	18.7%	3.9%

Notes: Author's tabulations from EMNV (2001, 2005, 2009) using survey weights.

According to this classification, in the 2001 and 2005 samples women were more likely to have low-return jobs than men were. Both family heads and offspring in single mother households had overall less chances of being stuck in low-return and low-skill jobs.

With the most represented categories being flexible and underemployed jobs, it is interesting to find more women than men in the occupations with lower working hours and higher educational requirements, which could indicate women's continuous load of house-care responsibilities. For Nicaragua, Montoya et al. (2015) find lack of daycare centers to be the second reason for housewives being out of the active labor force, making this feature of time-use a policy priority.

Among generations, offspring exhibited the highest share of flexible occupations. Underemployment issues where more prominent in single mothers, biparental male heads and biparental sons. Only in the 2009 sample underemployment is less of an issue for single-

mothers, and a bigger problem for male heads and sons in biparental households. With the 2005 sample, low-return occupations are more common for sons and daughters, as their younger age and lack of experience still does not let them access higher earning jobs. Low-skill positions are more frequent in members of single mother households and biparental male heads.

4.2 Intergenerational earnings elasticity estimates

This section presents the income elasticity estimates under different model specifications of the IV2SLS estimator. It is important to remember that the default control variables are offspring's age, age squared and a dummy for sample year (equation 2.2). The head's age, age squared and schooling were included as the basic instruments for the head's earnings. Other control and instrumental variables are described in Table 11.

Table 11: Intergenerational earnings persistence in Nicaragua

Dependent variable: Offspring's log earnings					
	(i)	(ii)	(iii)	(iv)	(v)
Head's log earnings	0.54	0.55	0.55	0.59	0.58
Standard errors	0.03	0.03	0.03	0.03	0.03
R-squared	0.21	0.21	0.24	0.19	0.13
Number of Obs.	2,587	2,587	2,218	2,562	2,587

Additional control variables are: (i) offsprings' age and age squared; (ii) offsprings' age, age square and dummy for sex; (iii) offsprings' age, age square, dummy for sex, dummy for single mother households and an interaction between agegroups and family arrangement; (iv) offsprings' age, age square, dummy for sex, dummy for single mother households, and housing price as instrumental; (v) no controls (only instrumental variables).

The results for the mobility elasticity show a high level of income persistence between Nicaraguan heads and their offspring. Recent elasticity estimates for the most developed countries range from 0.2 to 0.5, where coefficients closer to 0.5 correspond to the most unequal of them (CORAK, 2013). The traditional interpretation of our β_1 is that in Nicaragua parents with an income 10% below average will have offspring with an income between 5.4% and 5.9% below their cohort's average income.

It is important to recall that instrumental variables estimations represent the upper bound of the real elasticity coefficient. It is also a characteristic of this estimator to produce higher confidence intervals than OLS (WOOLDRIDGE, 2002). In this case, when observing the confidence intervals for our five specifications we found an ample coefficient ranging from 0.48 for the first specification up to 0.64 for the fourth.

Using equation iii we graph the persistence coefficients for single and biparental offspring by four age groups. According to Figure 12, older cohorts have higher persistence, with a more intense upward shift displayed by biparental offspring. The pattern of the elasticity displays a positive relationship with age, just as proposed in the life cycle bias explained in Grawe (2004b). There were also lower persistence estimates for single mothers' offspring than for their biparental cohorts, as displayed in Figure 12.

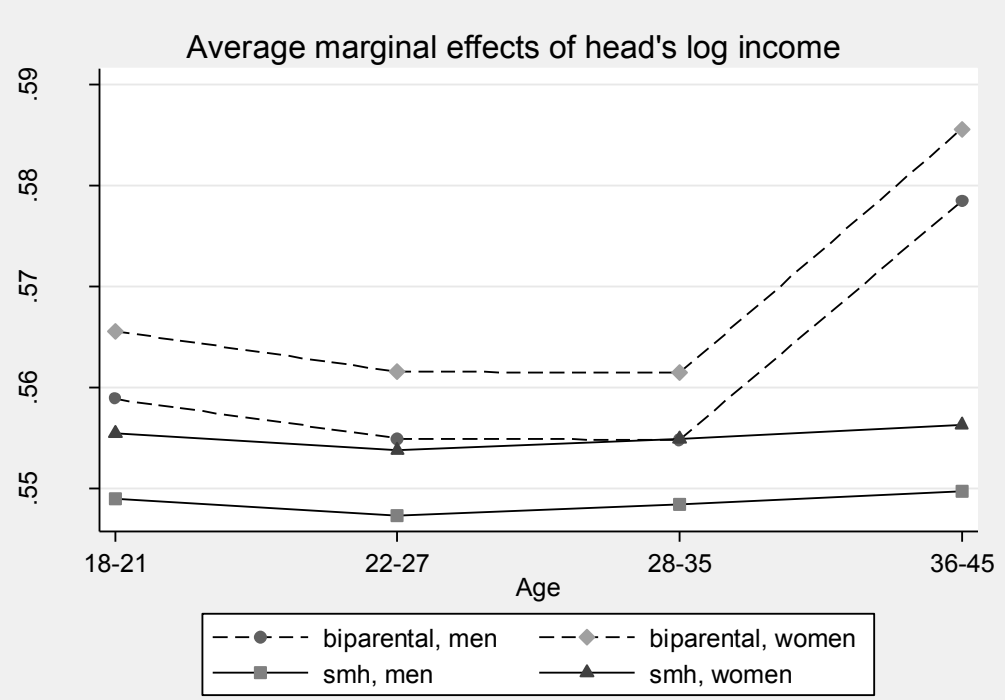


Figure 12: Elasticity coefficients among family offspring, by sex.

In order to have an overall idea of the upward and downward intergenerational mobility pattern we estimated a transition matrix of heads and offspring quintile earnings. Transition matrices are an alternative measure of the intergenerational log elasticity, not related to changes in inequality, that shows the probabilities of inter quintile movement for offspring, conditional to the quintile of the family head (FORMBY et al., 2004; TORCHE, 2013; CORAK et al., 2014).

The matrix shows the probabilities of a son/daughter with a father/mother in certain earnings quintile to fall below or rise above the head's quintile. Our matrix was build using data from EMNVs 2001, 2005 and 2009, with quintiles of the overall wage distribution, calculated for heads and offspring separately.

Table 12: Transition matrix of offsprings' earnings, by quintile*

Heads/Offspring	Bottom	2nd	3rd	4th	Top
Bottom	28	25	19	14	14
2nd	21	18	27	22	11
3rd	16	24	26	23	11
4th	17	16	12	23	32
Top	10	13	14	21	42

*Values expressed in probabilites.

As in most studies, using transition matrices, we found more persistence in the corners of the quintile distributions, with a higher probability of persistence for top incomes. Therefore, in Table 12 we have larger probabilities for offspring with family heads in the fifth quintile to remain in that position (42%). In second place, a probability of 28% was found for those whose father/mother belonged to the first quintile to continue there. Downward mobility is thus less strong than upward mobility, because there is a higher cumulative probability for people in the bottom quintile to rise to the top (72%) than there is for people with parents in the top quintile to fall to the bottom (58%).

For Brazil, Guimaraes Ferreira and Veloso (2006) suggest the existence of a 'wealth trap', complementing the poverty trap associated with the lowest quintiles of income. In our study, we also find such wage wealth trap, once the probability of an offspring with a parent in the first quintile moving up to the top quintile is small (14%) in comparison to the probability that a son/daughter with a father/mother in the top quintile remains there (42%).

5. Conclusion

Our findings reveal a high income persistence for Nicaragua, with a beta coefficient within the range of other Latin-American studies, and higher than the less mobile developed countries. Moreover, even when the distribution of income among households has been reduced in overall terms, there is still a great concentration of income in the top quintile of the population.

We found that women are more likely to have fewer weakly working hours, which suggests they prioritize occupations that allows them more time allocation in house and childcare. Governmental action is need not only to build more daycare institutions, but also to enforce men's shared responsibilities.

In contrast, income analysis revealed a narrowing gender wage gap over the past decade. Only for educational attainments, there were wider gender differences, as women displayed

more average years of schooling than men. The contrast of earnings elasticity between family groups revealed no significant inter group differences among single mother and biparental families.

Due to the high concentration of income in the upper quintiles, a recommendation for social policy is for government to implement tax reforms aimed at reducing income inequality (reduce tax benefits for top companies and update the rent tax progressive table). Other (more technical) recommendation would be to develop a longitudinal survey to monitor the patterns of social mobility. This would also make international comparisons more appropriate, and thus useful as benchmark of applied policies.

6. References

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V. CONCLUDING REMARKS

For Nicaragua, our research questions the notion of single mothers being poorer and disadvantaged in relation to biparental families, and thus transmitting their conditions upon their children. The analysis revealed that Nicaraguan households headed by single-mothers have similar socioeconomic conditions as families with both parents: in its levels of economic dependence, education, household income, and poverty. One explanation may be that, due to men's lower education, they would have a more challenging access to better paying jobs.

There is also a cultural component associated with secondary poverty in male-headed households, which has to do with men caring less for nutrition and schooling, while often maintaining more than one household or spending money on leisure for their own. Public policy should be oriented to correct this conducts, as well as other more structural economic factors behind the singlemotherhood phenomenon. These and other hypothesis could be tested by contrasting for different family arrays the elasticity between food groups and income.

Single mothers and their dependent children had higher education than two-parent families, both in average years of schooling and educational ranks. However, the educational levels of parents in the arrangements under consideration are still insufficient to ensure the eradication of poverty in the short/medium term. Furthermore, school attainments were significantly lower in rural areas. This situation is worrying, as the public education budget has remained at a relatively constant rate of total production in the last decade.

When examining female participation in the labor market it was inferred that the burden of domestic work –along the scarce availability of public daycare centers– limits the time women have to develop income-generating activities outside their homes, affecting their employability. It is important, therefore, to develop public policies related to the provision of more nurseries in order to balance the work-family binomial. In the same vein, by creating job categories for working adults, we found that women are more likely to have fewer weakly working hours, which suggests they prioritize occupations that allows them more time allocation in house and childcare. In contrast, when examining the last three household surveys, income analysis revealed a narrowing gender wage gap over the past decade.

Monetary household revenue by quintiles of income and economic dependency rates did not suggest important differences in the economic conditions among both households. Still, when the patterns of economic mobility were studied, there were not significant variations in earnings elasticity among family groups.

On the other hand, using analytical tools that take into account the different dimensions of poverty (beyond income) we found poverty dominance on male-led families over single-mother families and female-led biparental families. Within the multidimensional poverty analysis the most important contributor was the Living Standards dimension, especially in indicators directly related to housing conditions; the second most deprived dimension being Education. This reflects the need for governmental policies directed to reduce Nicaragua's housing and educational deficits as a priority.

Despite being less multidimensionally poor than male-led families, single mothers and their children suffer from the same deprivations as other family groups. In the child mortality indicator, for example, single mother led with higher deprivations rates. This could imply that single mothers are subject to more stress during pregnancy, when compared to biparental women.

Finally, our results conform to the line of thought that criticizes the belief of women being economically more vulnerable. Despite the socially extenuating atmosphere women are enforced to survive in patriarchal societies, our evidence reflects the resilience and audacity single mothers develop in face of such challenges. In a male-led world, it is paradoxical how women's socially constructed abilities (empathy, caretaking) takes them to better provide for their offspring and at the same time regain public prominence. The way forward, though, will need to include men to share household responsibilities in all dimensions, in societies with less asymmetric gender relations and more mutually discussed decisions.