Inter-American Development Bank
Banco Interamericano de Desarrollo (BID)
Research department
Departamento de investigación
Working Paper #439

What Drives Differences in Inequality across Countries?

By

Miguel Székely
Marianne Hilgert

Inter-American Development Bank

November 2000

Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Székely, Miguel.
What drives differences in inequality across countries? / by Miguel Székely, Marianne Hilgert.

p. cm. (Research Department Working paper series ; 439)
Includes bibliographical references.

1. Equality. 2. Household surveys. 3. Income distribution. I. Hilgert, Marianne. II. Inter-American Development Bank. Research Dept. III. Title. IV. Series.

320.011 S856--dc21

Inter-American Development Bank
1300 New York Avenue, N.W.
Washington, D.C. 20577

The Research Department (RES) publishes the *Latin American Economic Policies Newsletter*, as well as working papers and books, on diverse economic issues.

To obtain a complete list of RES publications, and read or download them please visit our web site at: http://www.iadb.org/res/32.htm

Abstract*

This paper presents microeconomic simulation techniques to examine what drives differences in inequality across countries. The simulation decomposes cross-country inequality differences into the importance of individual decisions, such as fertility, mating, labor force participation, and household structure, while at the same time including information on the importance of different income sources. The decomposition is applied to household survey data from 35 countries from 6 regions in the world. The empirical results provide insights into the transmission mechanisms through which inequality is generated.

Keywords: Inequality, income sources, household structure, fertility, mating, and simulation techniques.

***JEL* Classification:** D1, D3, J12, J13

* The authors are at the Research Department at the Inter-American Development Bank (e-mail: miguels@iadb.org and marianneh@iadb.org).

We thank Ricardo Paes de Barros, Suzanne Duryea, Alejandro Gaviria, Sam Morley, Ugo Panizza, Graham Pyatt, and conference participants at LACEA 2000 for useful comments and discussion, and John Dunn Smith for editorial improvements. We are especially grateful to the Luxembourg Income Study for providing access to their household survey data. The opinions expressed in this paper are the authors' and do not necessarily reflect those of the Inter-American Development Bank or its Board of Directors.

Introduction

One of the economic dimensions in which countries differ the most is their level of income inequality. These differences are relevant for at least two reasons. The first is that income distribution is regarded as an important determinant of growth and economic development.[1] The other is that the level of income inequality is informative about the access to economic opportunities and about the extent to which development is shared by different sectors of the population. It is even usually regarded as a measure of social justice *per se*, and implicitly, when countries have low levels of inequality, they are thought of as countries that are doing "something right."

In the economics literature the most common approach to explaining international differences in inequality has been to perform aggregate cross-country regressions that use macroeconomic indicators as explanatory variables.[2] This literature has identified some aggregate variables closely correlated with inequality differences, including financial market development, education levels, geographic conditions, and institutional factors. But this analysis has two limitations. The first is that the compilations of data on income distribution they use have important comparability problems. For example, in the widely used data set by Deininger and Squire (1996) the coverage of non-labor incomes is very heterogeneous, making it impossible to know whether differences in inequality across countries are genuine, or if they are due to the "noise" introduced by the lack of consistency in the data.[3] A second limitation is that these studies are only able to use observable country characteristics to explain inequality, but these may be correlated with other unobserved variables that also affect inequality. If unobserved variables are excluded in estimating the effects of observed variables, their exclusion causes unobserved variable bias in the estimated coefficients for the effects of observed characteristics.

This paper uses household survey data for 35 countries in six regions of the world to investigate the *microeconomic* factors driving the large differences in inequality across countries. Since our analysis deals with many elements that are not addressed by the more aggregate macroeconomic analysis mentioned above, it could be seen as a complementary effort to this literature. Furthermore, by taking a micro perspective, we are also able to address to some extent

[1] One of the latest literature reviews on this is the paper by Aghion *et al*. (1999).
[2] Papers by Li, Squire and Zou (1998), Gavin and Hausmann (1998), IDB (1999), and Squire and Lundberg (1999) are good examples of the growing list of works on the topic.
[3] See Székely and Hilgert (1999a), Pyatt (1999) and Atkinson and Brandolini (1999).

limitations of the aggregate approach. On the one hand, there are considerable improvements in data quality and in the capacity to account for the differences in the characteristics of the primary micro data itself. On the other hand, our approach clarifies some of the channels through which aggregate variables affect inequality. Although this does not fully solve the problem of unobserved variable bias, it provides insights into the "real" variables underlying the cross-country differences and into the transmission mechanisms through which inequality is generated.

Our approach is to compare the distribution of total household per capita incomes—which is the most commonly used concept of inequality—and then ask which of the elements of the process of household per capita income formation account for the differences across countries. Broadly speaking, we classify these elements into four sources of inequality. The first is the distribution of labor incomes. The second are all sources of non-labor incomes obtained by individual income earners, and which are linked more closely to capital and financial sources. The third is the set of individual decisions that lead to household formation. These include mating, fertility, household arrangements, and labor force participation.[4] The fourth element corresponds to the distribution of the incomes that individuals receive because they belong to a specific household (e.g., family allowances, means-tested transfers).

Knowing whether inequality in household per capita incomes is driven by labor market incomes, non-labor incomes, or by the ways in which individuals join together to form households is relevant because this information directs policy interventions towards totally different areas. For instance, if inequality is mainly due to differences in labor earned incomes, the most effective way to address the problem may be through changing labor market regulations, or by providing incentives to change the composition of the labor force—e.g., through increasing education. If the answer is that inequality is exacerbated by family decisions—e.g., if the poor tend to marry the poor, they have more children, and have fewer income-earners—the policy priorities will be different. Perhaps the most effective way to reduce inequality in this case will be through family allowances, facilitating the incorporation of low-skilled women into the labor market, or family planning. Yet, if non-labor income sources are what play a predominant role in generating inequality, the set of policies best suited to address

[4] These elements are not considered by standard decompositions of inequality by income source. Their inclusion makes it necessary to take a different approach than these decompositions.

the problem might be public pensions, financial policies, redistribution of physical assets, or other interventions that have less to do with labor markets or families.

To assess the importance of each of the elements, we propose a simple micro-simulation technique that recreates the process of income generation and family formation and which allows isolating each of the decisions that lead to the formation of household per capita incomes. The methodology is similar in spirit to the papers by Barros *et al*. (1995), Cowell (1996), and Cancian and Reed (1998), all of which use counterfactual distributions to assess the importance of one of the elements of the process of household formation on inequality. However, our method is quite different in three important ways. On the one hand, it connects labor markets with inequality of per capita incomes by looking at the *whole* process of income and family formation, rather than only focusing on mating, or earned incomes, as the aforementioned studies do. On the other hand, rather than imputing or changing the distribution of incomes to reproduce counterfactual distributions under some assumptions as in these studies, we modify family arrangements through a simulation that follows the decisions that individuals make in reality. The third important difference is that our analysis stresses country comparisons, rather than concentrating only on single country experiences, which leads to broader conclusions.

The main limitation of our methodological approach is that, although the results are informative on what *drives* inequality from a statistical point of view, the procedure is a descriptive accounting device. Strictly speaking, it does not intend to explain the causes of inequality, because it does not account for general equilibrium effects or the feedback effects that are characteristic of behavioral models.[5]

The rest of the paper is divided into four sections. The first explains our methodology for disentangling the aggregation from labor market inequality to household per capita income inequality. The second presents our empirical results. The third presents robustness tests to check if varying the assumptions about the process of family formation leads to different conclusions. The last section concludes.

[5] The papers by Kremer (1997), Greenwood *et al*. (1999), Knowles (1999), and Fernández and Rogerson (1999) address the question of the relation between family formation and inequality from a theoretical standpoint. These authors model individual choices, and account for feedback effects between elements of the family formation process. The works by Haurin *et al*. (1993), Sutherland (1996) and Behrman and Deolalikar (1993) are other examples of models accounting for the dynamics of household formation.

1. Methodology: From Labor Markets to Households

To perform our comparisons we estimate inequality by directly accessing household survey data for 35 countries. We divide these countries into six regions, based on their geographic location. The six regions are Latin America (LA), North America (NA), Western Europe (WE), Scandinavia—which is distinguished from the rest of Europe due to its lower inequality—Eastern Europe (EE), and Asia, where Australia is also included. Table 1 specifies the individual countries in each region, and Appendix Table A1 shows the name, year and origin of each database used.

Of the 35 countries in our study, we have direct access to 19 surveys. These include all the LA countries and Thailand.[6] We label the sources of these surveys "*LAC*" henceforth. The micro data for the rest of the countries are accessed from the Luxembourg Income Study (LIS). To minimize differences in survey years, we choose the household survey closest to 1995 for our comparisons.[7] In the Appendix we present a more detailed discussion about the characteristics of each survey and the differences across countries. Subtle differences in the classification and coverage of income sources are important for our analysis because they may make it appear that some specific sources play a more or less important role than others in the cross-country comparisons. Although we are not able to solve this problem, one advantage of our microeconomic approach over aggregate cross-country regressions is that we are able to identify the importance of non-comparable income sources in terms of their contribution to differences across countries.

Throughout the paper, our benchmark for comparison is the distribution of total household per capita net incomes, which is presented in the second column of Table 1.[8] While developed countries usually use some measure of economies of scale in household consumption as well as equivalence scales, this is not common practice in developing countries. The main reason why we focus on per capita incomes is that this definition has a clearer interpretation, namely that it is assumed that there are no economies of scale in consumption and that all

[6] These surveys were obtained directly through country statistical offices and through the MECOVI program. All surveys, except those for Argentina and Uruguay, are nationally representative. In the case of Uruguay, the survey covers around 90 percent of the total population of the country, while in Argentina, the survey covers around 70 percent.

[7] In our empirical analysis we experiment with other years, when available, but our main conclusions are not sensitive to the choice of a specific survey.

individuals in the household have the same needs. Finally, throughout the paper we use the Gini index of inequality because it is the most widely used measure, and it is practically the only index used in the aggregate literature for inequality cross-country comparisons. However, our method can be easily adapted to the use of other indexes, or equivalence scales.

1.1 Base Country Rankings and Household Per Capita Income Formation

In Table 1 countries are ranked within each region by the Gini for household per capita net income (which we label G_{hh} henceforth). As can be seen, there are huge disparities in our sample. On the one hand we have Brazil, as the most unequal country with a Gini of 59.06 points, while the country with the lowest inequality of household per capita income is Finland, with a Gini of 24.64. On average, the most unequal region is Latin America, followed by Asia, North America and Eastern Europe. Western Europe has considerably lower inequality, while the three Scandinavian countries in our data set have, on average, the lowest Gini.

The main idea of our simulation methodology is that G_{hh} is obtained through the mixture of four basic elements, and so differences among countries such as those in Table 1 can be thought of as a sum of the differences in these components. The first element is the distribution of labor earned incomes among labor income earners, which can be thought of as the inequality generated in the labor market. We present the Gini for this source in the third column of Table 1.[9] Following the standard classification in household surveys, labor earned incomes include resources from formal employment, self-employment, and informal activities, but in the LIS surveys incomes from self-employment are classified as household rather than individual incomes. At the bottom of the table we include the correlation coefficient between labor earned income inequality and G_{hh}. The correlation in LA and the other countries is very high, but not perfect. Appendix Table A3 shows that in practically all the countries, these incomes represent more than 60 percent of total income.

The second element corresponds to other sources of income that can be linked to individual earners but that do not correspond to payments to labor as registered in the surveys. As discussed in the Appendix, there is considerable variety across countries in the specific

[8] In the first column we show the distribution of gross incomes, where available, for reference. All Gini coefficients are multiplied by 100 for ease of presentation.

[9] The statistics for LA are different to the distribution of labor incomes presented in Székely and Hilgert (1999b), because in that paper the calculation refers to household per capita labor incomes, while here we present the distribution among income-earners.

sources included in this group, and the surveys for Nicaragua, Honduras and Peru do not even include information on them (Appendix Table A2). In general, they can be thought of as resources that are obtained by individuals as a return to physical capital (in the LAC surveys), financial resources (e.g., savings, pensions), or even as payments from insurance (e.g., unemployment benefits in LIS). With the exception of the Eastern European region and some individual countries, these sources are typically distributed more unequally than G_{hh} (see Table 1). The correlation with G_{hh} is high in the LA countries, but it is rather low in the rest. Table A3 shows that the relative importance of these incomes differs substantially by country, and reaches at the most 34 percent of total income (in Sweden).

The third element in the process of household per capita income formation is that when individuals join together to form households, in some sense they "pool" the labor and non-labor incomes they earn as individuals, and "share" them with other individuals that belong to the same household. The degree to which "pooling" and "sharing" take place varies across countries and households. The use of household per capita income assumes a "sharing" rule of perfect equality, so the resources available to each household member depend on the number of income-earners, and on the number of individuals that are being supported by this income. Two individuals with identical labor or non-labor earnings may end up with completely different household per capita incomes if they have different fertility, mating, household structure, and time-use preferences. Similarly, two countries with an identical distribution of income among income-earners may end up with differences in G_{hh} if family arrangements vary.

Table 1 illustrates the extent to which countries differ in terms of household structure and family characteristics. For instance, while the average dependency ratio in LA countries is 1.83 non-earners per each individual income earner, in Scandinavian countries the ratio is only 0.12. Household size also differs significantly, with LA households being more than double the size of those in NA, EE, Scandinavia, and WE. Female labor force participation, which is related to the number of income earners per household, is significantly higher in the most developed countries. There is also a clear pattern of disparities in household arrangements, with LA countries and Taiwan and Thailand having a higher proportion of extended and nuclear households, and the other regions having much greater shares of single person households. The correlation coefficient between G_{hh} and each of the demographic and family characteristics in Table 1 is

strong enough to suggest that these are important components in the process of household per capita income formation.

Finally, the fourth element is that individuals may be eligible for receiving certain incomes only because they belong to a specific household. The last columns in Table 1 present the Gini index for the distribution of these household incomes, as well as their correlation with G_{hh}. In LA the correlation is quite strong, but the differences in coverage across countries is considerable, and as discussed in the Appendix, the specific items included in each survey may vary.

1.2 Simulation Methodology

In essence, the objective of our methodology is to test to what extent the differences in G_{hh} across countries are due to each of the four elements. There are four specific hypotheses: (a) Labor markets generate income differences so that even after individuals mix other income sources, create families, and form households, the inequality persists. (b) Non-labor incomes are distributed in such a way that, whatever the distribution of labor income and whatever the family arrangements, in the end some countries are more unequal than others mainly because of the distribution of these sources. (c) Differences between countries arise mostly when individuals join together into households. This is because of the extent to which the poor tend to marry the poor (rich), to which low income individuals tend to have more (fewer) children, and to which individuals with lower (higher) income-earning capacity participate less (more) in the labor market, varies across countries. (d) When individuals join into households they obtain other incomes, precisely because they belong to a particular household, and it is these incomes that generate most of the differences in inequality.

The first step for assessing each of these possibilities is to express the income (y) of each individual income-earner j as the addition of the hourly labor earnings (y_w) multiplied by the number of hours worked (t), plus non-labor incomes (y_k):

$$y_j = (y_{w,j} * t_j) + y_{k,j} \quad (1)$$

The per capita income ($y_{hh,i}$) of each individual (i), belonging to household (hh), is expressed in the following way:

(2)

$$y_{hh,i} = \frac{y_h + y_s + \sum y_{ch} + \sum y_a + \sum y_e + \sum Y_H}{\left(N_{h,y} + N_{s,y} + N_{ch,y} + N_{a,y} + N_{e,y}\right) + \left(N_{h,ny} + N_{s,ny} + N_{ch,ny} + N_{a,ny} + N_{e,ny}\right)}$$

where y_j for $j=h,s,ch,a,e$ denotes the income of each earner in the household. Subscript $j=h$ refers to the head of the household, *s* refers to the spouse or partner, *ch* stands for children, *a* are other adults, and *e* are the elderly living in the same household. Y_H are the incomes that the household obtains as a unit and that cannot be attributed to any individual member. The *hh* subscript for each income-earner is not shown for simplicity. Thus, the numerator in (2) adds the resources of all household members that report income, as well as the incomes received as a unit.

Since we focus on per capita income inequality, in the denominator we have all household members introduced with the same weight. These are classified into household heads reporting income ($N_{h,y}$), spouses that are income earners ($N_{s,y}$), number of children earning income ($N_{ch,y}$), number of adults earning income ($N_{a,y}$), elderly earning incomes ($N_{e,y}$), plus the number of heads, spouses, children, adults and elderly not earning income, but still living in the same household (($N_{h,ny}$), ($N_{s,ny}$), ($N_{ch,ny}$), ($N_{a,ny}$), and ($N_{e,ny}$), respectively).

With equations (1) and (2) in mind, we can view the process of family formation as a series of steps between two extremes. On one extreme we have the inequality of hourly earnings among labor income earners ($G_{w,t}$, which is the Gini for the distribution of $y_{w,j}$), which is regarded as the "pure" inequality generated in the labor market. At the other extreme, there is the inequality of total household per capita income (G_{hh}, which is the Gini for the distribution of $y_{hh,i}$). G_{hh} includes information on labor, non-labor, and family incomes (the numerator in equation (1)), as well as labor force participation decisions and the process of family formation including mating, fertility, and the incorporation of adults and the elderly (the extended family) into the household, which appear in the denominator.[10]

Our simulation for disentangling each element consists of linking the two extremes through several intermediate steps in such a way that the importance of each of the components

[10] We take the distribution of hourly earnings as our initial point for the simulation because, as can be seen in Appendix Table A3, in all the countries in our sample (with the sole exception of Sweden), labor incomes represent more than 50% of total income, while there are only three cases where they account for less than 60%. We perform a decomposition of inequality by income source (not presented for brevity) following the method by Shorrocks (1982), and in all countries labor incomes represent more than 50% of total inequality. Alternatively we could depart from the distribution of non-labor incomes (presented in the fourth column of Table 1), and in fact, our main

of equations (1) and (2) can be isolated. Specifically, we take $G_{w,t}$ as a starting point and simulate a situation where all labor income-earners are restricted to the following six conditions:

(i) Each labor income earner works the same number of hours (with $t>0$).

(ii) Labor incomes are perfectly positively correlated with non-labor incomes.

(iii) Each income earner is a household head living *without* a spouse or partner.

(iv) Each household head has the same number of children to support, and none of them is an income-earners.

(v) Each head has the same number of "extended" adult and elderly members to support. These additional members share income, but do not contribute with resources to the household.

(vi) Labor incomes are perfectly positively correlated with Y_H.

It is easy to verify that under these restrictions $G_{w,t}=G_{hh}$, and that in reality the two statistics will differ to the extent that the conditions do not hold. By relaxing one restriction at a time it is possible to recreate the effect of each of the decisions that lead from $G_{w,t}$ to $G_{hh.}$ The question is to choose a reasonable cumulative sequence for eliminating the restrictions.

There is evidence that in developing countries household formation has a pattern that is similar to the life-cycle of individuals, so we can follow a similar path for household formation in our simulations. For instance, Attanasio and Székely (2000) show that in LA and Asian countries, the average individual in the earlier part of his/her life cycle typically belongs to a nuclear household. When the individual reaches around 25 years of age he/she forms his/her own household by joining a partner or spouse, and soon after, family size starts increasing as the couple has children. When the household head reaches around 45-60 years of age, a considerable proportion of households become extended units either by incorporating the elderly, other family members, or non-relatives, or because children reach an age at which they start becoming income-earners themselves and are therefore considered adults. In light of this evidence, a natural path is to follow a similar sequence for relaxing each constraint, and this is the way in which we proceed. It must be stressed, however, that the methodology could easily be adapted to other decision-making paths. In Section 4 we explore other options.

---

conclusions hold also under this path. We focus mostly on the simulation that takes the distribution of labor incomes as a starting point because we believe it is more intuitive.

By following the life-cycle path, we identify the following effects:

I. The "Hours Effect": We depart from $G_{w,t}$ which is computed including only individuals receiving earned labor-incomes (that is, with $t>0$). One of the necessary conditions to make $G_{w,t}= G_{hh}$ is that all earners work the same number of hours, but we know that in reality this is not the case. To account for the distributive effect of differences in hours worked, we go to the micro data and multiply hourly labor earnings by the number of hours each individual actually works. The distribution resulting from this is the inequality of total labor earned incomes among individual earners (G_l). We call the difference between $G_{w,t}$ and G_l an "hours effect," but we would like to stress that this difference is interpreted as an "effect" in an accounting sense and not as an explanation for the level of inequality. This is because $G_{w,t}$ and G_l are not necessarily independent, and different individuals may decide to work more or fewer hours depending on the level of their hourly earnings. Additionally, although highly unlikely, it is hypothetically possible to have $G_{w,t}=G_l$ even if there were differences in hours worked across individuals. For this to be the case, the distribution of hours would have to be such that after multiplying hours by hourly earnings, the position of individuals in the distribution switches perfectly symmetrically.

II. The "Other-Incomes Effect": We also know that in reality labor earned income is not perfectly correlated with non-labor individual incomes, but imposing the second restriction simulates a situation where this is the case. To recreate the effect of relaxing the second restriction, we follow two steps. First we perform a simulation that is equivalent to allowing each labor income earner to obtain the non-labor income each receives in reality, and then compare this new distribution of total income for each individual with G_l. In this way the sample of individuals over which inequality is computed is still the same as for G_l.[11] The second step consists of including in the sample all individuals who earn only non-labor incomes and who have been excluded so far from the calculation of G_l. We call this inequality G_y, and the difference between G_y and G_l, is labeled "other incomes effect." Intuitively, this is the inequality accounted for by the fact that labor incomes are not perfectly correlated with other sources.

[11] It should be noted that even if the two distributions were identical, this does not imply that there are no redistributions of income among individuals when non-labor incomes are added. It is possible that individuals are re-ranked from the bottom to the top of the distribution and vice versa when including non-labor incomes, but if the effects cancel out, the Gini will remain stable.

Again, G_y and G_l are not necessarily independent, so the "other incomes effect" is also an effect in an accounting sense.[12]

III. "Family Effects": Up to this point the restrictions are equivalent to a situation where individuals do not merge together into families and where the population is only composed of income-earners. Under our scheme, this implies $G_{y=}G_{hh}$. However, we know that in reality individuals join together into households through formal or informal arrangements, that they have children, and that there is a wide variety of family structures and time-use choices depending on particular preferences and needs. The reasons why individuals form households, as well as the ways in which they choose to do so, are not totally understood,[13] and as mentioned above, for this work we view the process of family formation as a sequential chronological decision that follows the typical pattern of life-cycle decisions. This is similar to a process of endogenous family formation where decisions are taken depending on the situation of the household at each point in time. The process of household formation has four intermediate steps:

a) "Mating Effect": Chronologically, the most common decision that individuals make when they decide to form their own household by leaving the parental unit is whether they want to remain living as a single-person household, or if they prefer to make informal or formal arrangements to live with a partner or spouse. The third restriction imposed above actually constrains individuals to live without a partner. To recreate the mating process and relax this restriction, we go to the micro data to identify individuals with their real-life partner, whenever they have one. Since in reality some individuals join with non-income earners and some do not join a mate at all, we take two separate steps. First, we take the population included in the computation of G_y and modify the data by joining individuals with their couples and assigning each of them the average between their two incomes, rather than their respective individual incomes. This can be thought of as a "mating effect" among earners. Secondly, we allow *all* individuals to join their real-life partners, regardless of whether they earn incomes or not. To do this we include all partners that do not report income and were

[12] Since there are important cross-country differences in the income sources included in non-labor incomes for individuals (documented in Table A2), an alternative interpretation of the difference between G_y and $G_{l,}$ is that it illustrates how much inequality originates from the fact that the surveys are not strictly comparable because the coverage of non-labor incomes differs.

excluded from the sample so far and assign each member of the couple the average income of both individuals. We label the new simulated inequality $G_{h,s}$, which is the distribution that relaxes conditions (i)-(iii), and which includes couples with two income earners, couples with one income earner, and other individuals who earn an income but that do not have a partner or spouse. The difference between $G_{h,s}$ and G_y is called the full "mating effect," and it is interpreted as the inequality accounted for by some individuals deciding to live as couples, and the specific pattern of matches will determine the sign of the difference. The difference between the full and the partial "mating effects" can be thought of as a "spouse participation effect," given by the fact that some individuals form couples with income earners and some join with non-income earners.[14] As with the "hours" and the "other incomes" effects, $G_{h,s}$ and G_y are not necessarily independent, since a spouse or partner's decision to earn income may be contingent on the other partner's income.[15]

b) "*Fertility Effect*": If restrictions (iv)-(vi) held in reality, we would have that $G_{h,s}=G_{hh}$, which among other things assumes that all couples and single individuals have exactly the same number of children and that none of these children are income earners. However, we know that this is not the case, and we can relax this assumption by going to the micro data and "allowing" children to join their real-life household. To do so, we proceed in two steps. First we merge income-earning children, and secondly, we include the children that have not yet appeared in the measurement of inequality because they are not income-earners. When merging children into their real-life households we add up the income of the head, spouse, and children, and split it in equal proportions for each member. This yields an inequality index labeled $G_{h,s,c}$, where couples and children form nuclear households. The sample used to compute $G_{h,s,c}$ are couples (or single parents) with children earning income, couples (or

[13] See for instance Weiss (1997) and Bergstrom (1997) for good reviews of some of the explanations that economists have proposed, and Sorrentino (1990) for differences in family arrangements among developed countries.

[14] It should be noted, however, that spouses that are not classified as participating in the labor market do not necessarily work less. They may even work more hours than those who participate, but do not receive a remuneration for their labor. It should also be borne in mind that even in the case where there was relative stability in the Gini through the simulated mating process, this does not imply that there are no re-distributions among individuals and that there are no re-rankings along the distribution. It is possible that the Gini remains stable if the re-rankings at the upper and lower parts of the distribution perfectly compensate each other.

[15] As explained by Weiss (1997), when individuals form a couple they may also take the decision for one to specialize in work at home and the other in market work, and the decision may be totally driven by the market income-earning prospects of each member of the couple.

single parents) with children not earning income, couples with no children, and individuals that do not have a spouse nor children. We label the difference between $G_{h,s,c}$ and $G_{h,s}$ a "fertility effect" that accounts for the fact that different individuals have different numbers of children. As with the previous effects, fertility choices and the other individual decisions may not be independent, and it is hypothetically possible (although highly unlikely) to have $G_{h,s,c}=G_{h,s}$ even if there were differences in the number of children across households.

c) "*Extended Family Effect*": Restriction (v) implies that all households are either nuclear families, couples with no children, or single-person units. If this was the case we would have $G_{h,s,c}=G_{h,s}$, but we know that in reality this is not so. Some individuals form households with other adults. Chronologically, the following step in our simulation is to account for this fact. As in previous restrictions, we simulate the process of extended household formation by going to the micro data and matching adults and the elderly into their real life households. We then add up the incomes of all household members and assign each individual the per capita income of the unit. We perform the simulation in two steps, by first matching extended family members earning income, and then merging non-income earners into their real-life household. We separate the process by first merging adults, and label the distribution $G_{h,s,c,a,}$ and we then incorporate the elderly to obtain the distribution $G_{h,s,c,a,e}$, which includes all household members. The difference between $G_{h,s,c}$ and $G_{h,s,c,a,e}$ is called the "extended family effect," which fully accounts for differences in household structure across individuals.

IV. "Family Income Effect": Finally, the only difference remaining between $G_{h,s,c,a,e}$ and G_{hh} is assumption (vi): that labor earned incomes and family incomes are perfectly correlated. To fully account for the process of household and income formation, we can go to the micro data and add the family income that households receive in reality. This yields G_{hh}. As in the previous effects, the difference between $G_{h,s,c,a,e}$ and G_{hh} is the inequality accounted for by the fact that not all households receive the same family incomes, but since these are not totally independent from other incomes and from family structure, strictly speaking they would only be able to be interpreted as an explanation of inequality under some special conditions.

So far we have assumed a specific cumulative sequential process of family decisions that starts with $G_{w,t}$, and ends up to G_{hh} but it is clear that the magnitude of each of the "family effects" will depend on the particular sequence chosen. If the incomes of each individual earner

were interpreted as different income sources that the household head receives, our simulation method would be similar in spirit to standard decompositions of inequality by income source, which do not depend on a particular sequence of introducing each of the elements. However, there is an important distinction. In standard decompositions by income source, to obtain the contribution of each element, it is necessary to hold constant the population included in the calculation of G_{hh}, which must be the same as the population included in the estimation of each of the separate components. This clearly leaves out important information on the "family effects." So, by using our method rather than standard decompositions the results are path dependent, but there is considerable gain in terms of information on the sources of inequality.

Another important issue is that, in reality, the magnitudes of each of the "family effects" will depend on how individuals decide to share their income within the household. As mentioned above, for our empirical results we assume on the one hand, that there are no economies of scale in consumption, and on the other, that each household member is allocated the same share of the available resources. Although these are perhaps not the most realistic assumptions, they have the advantage of a clear intuitive interpretation.[16] In this framework, they imply that all "family effects" will refer to the upper-bound impact of family arrangements. For brevity we do not explore other possible assumptions about economies of scale or the ways in which resources are distributed within the household, but it is clear that other schemes can be easily accommodated in this framework.

3. What Drives Inequality Differences?

In this section we present our main empirical results from the application of the simulation methodology. We start by focusing on comparisons across regions and then turn to differences within each region and other country comparisons. In Tables 2 and 3 we present the distributions representing each of the steps in the process of income and household formation.

3.1 Cross-Regional Comparisons

In Table 2, rather than starting the simulations with $G_{w,t}$ we present in the first three columns some more basic statistics of interest. The first column shows the inequality of hourly earnings among males in the 15-65 age range. This is the most conventional measure of labor market

[16] Behrman (1997) presents a review of the literature on the distribution of resources within the household.

income inequality, and it is considered more "pure" than our measure of $G_{w,t}$ because it is less affected by labor force participation decisions. There are some re-rankings across the six regions as compared with the rankings in Table 1 by G_{hh}. While Latin America still has the highest Gini, it is now followed by NA rather than Asia, and rather than having the Scandinavian countries as the most equal, the lowest Gini is found in WE. The following column presents the distribution of hourly earnings for females. In this case, the Scandinavian countries have the lowest Gini, followed by EE and WE.

The third column shows the distribution of hourly earned incomes among all male and female income earners in the 15-65 age range. The comparison between this and the previous two columns can be interpreted as the effect of incorporating males and females into the population. For instance, if we take the male population as the point of departure, the inclusion of females has practically no effect in LA and EE, but it contributes to more inequality in the other regions, especially so in WE. Alternatively, if we first consider the second column, including males into the distribution of female hourly earnings only has a notable effect in EE. Thus, it seems safe to say that the main reason why WE ranks as the most equal region in terms of column 3 is because of the low inequality in hourly earnings among males.

The difference between the Gini in the third column of Table 2 and $G_{w,t}$ is the inclusion of income-earners outside the 15-64 age range.[17] This has a strong inequality-reducing effect in NA, Scandinavian countries, and WE, while it has strong disequalizing effects in EE. These changes can be interpreted as the distributive effect of differences in labor force participation rates among the non-working-age populations, and in some cases they are large enough to reverse regional rankings. For instance, in the ordering by the third column EE appears to be more equal than Asia and NA, with a difference of about three and almost six points, respectively, while according to $G_{w,t}$ they have practically the same inequality.

The starting point for our simulation is the fourth column with $G_{w,t.}$ It can be compared with G_l in the fifth column to measure the "hours effect." There are considerable differences across regions. While in LA and EE the "hours effect" is negative, it contributes to increased inequality in the rest of the regions, and in NA and WE it does so considerably. The difference between $G_{w,t,}$ and G_l leads to some important re-rankings. Due to differences in hours worked,

[17] Note that the surveys for Norway, Finland, Poland and Thailand do not include information on number of hours worked. In these cases, we report G_l rather than $G_{w,t,}$ and we are not able to calculate the "hours effect." Hours effects are assumed to be zero in these countries.

NA appears to be much more unequal than EE and Asia, even though they had practically the same $G_{w,t}$. It is possible that the reason for the differences is that individuals with lower hourly earnings work more hours in LA and EE relative to those with higher hourly earnings, while the opposite is the case in the other regions. The first column of Table 4 presents the correlation coefficient between hours worked and hourly earnings, and confirms that the correlation is negative in LA, EE and Asia. One plausible interpretation is that income and substitution effects from increasing hourly earnings are different at different levels of development. In the relatively poorer regions in our sample, which are LA, EE and Asia, the income effect is stronger among the poor, but as incomes rise the substitution effect kicks in.

To assess the effect of other income sources we first compute the distribution of total individual incomes (including non-labor sources) among labor earners. This appears in the column labeled (3) in Table 2. We then include individuals who are only non-labor income earners to obtain G_y (presented in the last column). We also include the distribution of non-labor incomes among non-labor income earners (excluding labor earners) for reference. The full "other incomes effect" is obtained from subtracting the Gini in the columns labeled (4) and (2). At the regional level, including non-labor individual incomes has the strongest equalizing effect in the Scandinavian countries. The effect is also negative, although smaller, in NA and EE, while it is positive in LA, WE, and especially in Asia, where including non-labor incomes increases the value of the Gini index by more than five points. There are two important re-rankings that take place after the "other incomes effect" is accounted for. One is that Asia is considerably more equal than NA according to G_l, but it has higher inequality when measured by G_y. The other is that Scandinavia and WE switch in their ordering.

It is tempting to interpret the difference between G_l and G_y as evidence of the impact of non-labor incomes over inequality. Under this interpretation, non-labor incomes are, for instance, less disequalizing in LA than in Asia, while they are strongly equalizing in the Scandinavian countries. These disparities appear to be an important source of difference between the regions. Note, for instance, that the difference in Gini points between Asia and Scandinavia according to G_l is only about four points, while the difference according to G_y is around thirteen points. However, as noted in the Appendix, there is great variety in the sources included in the non-labor-incomes category in each country (Table A2). Therefore, the difference between G_l and Gy may in part be a result of differences in income coverage or definitions. The difference may well

be thought of as "noise" introduced into the distribution by including sources with differential coverage across countries. In any case, one advantage of the comparison is that it provides a good idea of the impact of including these non-comparable income sources into the measurement of inequality.

Table 3 presents the "family effects." For reference we include G_y in the first column. There are four issues for implementing the following simulation. The first is the definition of household head, which is the individual taken as reference to establish kinship with other members of the household.[18] For simplicity we use the self-declared definition of head. The second is to establish a cutoff point after which children are considered adults. We establish this cutoff point to be 20 years of age, since at this age the share of individuals earning incomes increases considerably in most of the countries in our sample. Therefore, a household composed of a couple and children under 20 will be classified as "nuclear," while a similar household with a child age 21 will be considered an "extended family." We experiment with considering all individuals over 18 years of age as adults, but our conclusions are not sensitive to these cutoff points.[19] The third is that in some household surveys it is not possible to know with certainty what the relation between the head and other members is (e.g., if all children living in the household are in fact children of the head). To implement our approach we classify individuals as children or adults living in the household according to their age, which implies that they are not necessarily related by kinship to the head. The fourth is that in some cases we are not able to confirm if the head of the household and the individual identified as the spouse constitute a formal couple or if they are joined by informal arrangements. For our simulation we do not make any distinction between these two possibilities and always refer to the partner of the head as spouse for simplicity.

Subtracting the Gini in the columns labeled (5a) and (5b) from column (4) in Table 3 provides the "mating effect." The differences across regions are even stronger than for the "hours" or "other incomes effect." The full "mating effect" is most negative (almost eight Gini points) in NA, and of more than five points in WE and Scandinavia. About half of the full "mating effect" is accounted for by matching income earners with their (income-earning) real-

[18] We use the standard definition of household in the LIS and LAC surveys, which is the unit including all individuals that share the same budget, and where sub-units are counted as being part of the same household.
[19] Note that other definitions that may be more appropriate for particular countries can easily be implemented within this framework.

life couples, while the other half is from matching non-earners with their partners. In the other three regions "mating" also reduces inequality, although the effect is smaller. Another important difference is that in LA, EE and Asia matching non-earners to their income-earning partners actually increases inequality, rather than reducing it. This points to the importance of differences in labor force participation among spouses in these regions.

The "mating effect" produces some important re-rankings across regions. Table 3 shows, for instance, that the relative position of NA improves considerably with respect to EE and Asia after individual income earners are united with their spouses into the same household. The information in Table 4 helps to interpret these differences. The third column shows the correlation between the income of the head and the spouse for cases where both are income-earners. As expected, the correlation is much lower in NA, Scandinavia, and WE than in Asia, LA, or EE. This suggests that in these last regions, there is greater assortative mating. In the second column of Table 4 we present the correlation between years of schooling of the head of the household, and schooling of the spouse whenever the head has a partner or spouse. This could be interpreted as the correlation of the potential income-earning capacity. Asia and LA also appear to have the highest coefficients in this case, but EE has a lower correlation, which is similar to that observed in WE. The fourth column shows the correlation between the income of the household head and all spouses, regardless of whether they are earners or not (incomes are defined as equal to zero for non-earners). The pattern of lower correlation in NA and WE, and the much higher correlation in EE, LA and Asia, holds, suggesting not only that assortative mating is stronger in these last regions, but also that the spouses' decisions on whether to participate or not in the labor market are also more contingent on the head's income.

The "fertility effect" is obtained from subtracting column (6a) and (6b) in Table 3, from column (5b). As expected from the demographic statistics presented in Table 1, the strongest inequality-increasing "fertility effect" is observed in Asia and particularly in LA, while there are only mild effects in the other regions. This evidence, added to the correlation coefficients in Table 4, suggests that especially in Asia and LAC, the fact that some (lower income) individuals decide to have more children than others is an important source of regional inequality differences. The decision of incorporating children into the labor market also seems to generate inequality because, according to Table 4, children of higher income parents tend to obtain higher earnings.

Column (7a) to (8b) in Table 3 presents the "extended family" effects. In column (7a) we show the inequality index $G_{h,s,c,a}$ estimated by incorporating income-earning extended family adults, while in column (7b) we incorporate the remaining adults that belong to the household, but that do not earn income. Columns (8a) and (8b) present the distributions that incorporate the elderly (individuals over 65 years of age) that are not household heads. In NA, WE, Scandinavia and EE, the total "extended family effect" is rather small, which is not that surprising given the high proportion of single person households and the small share of extended family units documented in Table 1. In LA and Asia, the effect of including the extended family reduces inequality by about three Gini points, which is not negligible when compared to the previous effects. One interpretation is that in poorer countries individuals have more incentives to form larger households because the lower the income, the higher the gains from economies of scale in consumption. Since incorporating income-earning adults into their real-life household (column (7a)) drives most of the effect, this is also capturing differences in the age structure of household members.

The last step in the process is to include the effect of the family incomes to which individuals have access because they belong to a specific household. In the case of countries that do not report these incomes (see Table A2), the Gini coefficient reported in column (8b) in Table 3 is equal to G_{hh}, while in the others, it is still necessary to subtract G_{hh} from $G_{h,s,c,a,e}$ in column (8b) to add up to the distribution of total household per capita income. In LA, NA, EE, and WE the "family income effect" is rather small (less than one Gini point), while in Scandinavia, and especially in Asia, it is equalizing. While the reduction in Scandinavia is not surprising because of its long tradition of providing social benefits through family allowances and transfers, the rather small effect in WE is quite unexpected. However, the results should not be interpreted straightforwardly as evidence that family incomes do not contribute to reducing inequality in WE. The variety of income sources included in "family incomes" may be large enough to blur the country comparisons, and also, the effect may appear to be stronger in some countries simply because the household surveys may be better able to capture these incomes. The "family income effect" could even be interpreted to some extent as a measure of the quality of the survey instruments. A low value may well correspond to the lower coverage of the source.

It should be noted that in our calculations we are not able to take into account the fact that in some countries governments provide goods or services directly to the household, which are

not accounted for as income. If in some country there is a well-established system of social security that provides some services at no cost, while in another the government provides families with transfers to acquire exactly the same service, in our simulation it would appear that the "family income" effect is smaller in countries where governments choose to provide services directly, while perhaps, after considering the monetary value of the services, the effect on inequality could be considerable.

To summarize the conclusions about what drives differences in inequality across regions, we perform the following decomposition. First, we compare the difference in Gini points in $G_{w,t}$ between each region, and the Scandinavian countries, which we take as benchmark because they have the lowest G_{hh}. Secondly, we compare the magnitude of each effect, with the effect in Scandinavia, in such a way that by adding up the difference we end up with the difference in G_{hh} between this region and the rest. Figure 1 summarizes the results. In the horizontal axis we indicate the region with which the Scandinavian countries are being compared.

The first bar corresponds to Latin America. At the top of the bar we indicate that the difference in G_{hh} across these two regions is of 27.5 Gini points. This difference is decomposed into each of the effects identified above. About one half of the difference is accounted for by the inequality of hourly earnings, which are the disparities generated in the labor market. About five points of the difference appear to be due to the "mating effect" reducing inequality much more in Scandinavia, while about three points are accounted for by differences in the "fertility effect," which has stronger disequalizing effects in LA. Non-labor and family incomes account for about six Gini points of the gap, but again, given the differences in income-source coverage, to some extent this can be thought of as evidence of the importance of lack of consistency across surveys. The gap between the regions is ameliorated by eight Gini points by the "hours effect" and the "extended family effect." This suggests that in LA individuals with lower hourly earnings work relatively more hours than higher income-individuals, and relatively lower income households have a greater tendency to "pool" more incomes by creating extended families.

The second bar shows that the difference with NA is accounted for mainly by the distribution of hourly earnings, by non-labor income sources, and by family incomes. Family arrangements account for a smaller part of the difference and in fact, the extended family and the greater equalizing effect of mating in NA reduce the gap. The third bar corresponds to the comparison between the Scandinavian countries and WE. WE actually has a better distribution of

hourly earnings than Scandinavia. The higher inequality in G_{hh} in WE is accounted for by non-labor and family incomes.

The EE countries have a Gini that is 12.4 points higher than Scandinavia's. The most important sources of the difference are the hourly earnings and the "mating effect," which reduces inequality by much more in Scandinavia. The difference with Asia is of 13 points. The most important sources of this disparity are the distribution of hourly earnings, non-labor incomes, and the "mating effect." The gap would actually be much larger had the "hours" effect not been less disequalizing and the "extended family" and "family incomes" effects not been more equalizing in Asia.

3.2 Differences Within Regions

The case where the country-specific pattern conforms most closely to the regional averages is Scandinavia. Eastern Europe is another case where the magnitudes of the effects by country mostly have the same sign, but still there are differences in the size of the effects that change the ordering. NA and Asia are two cases where regional averages do not reflect the pattern of a particular country. In NA, the United States (US) has a G_{hh} that is more than eight points higher than Canada. Practically the whole difference between the countries is accounted for by differences in the inequality of hourly earnings, where the US has a Gini that is ten points greater. In the end, the gap is smaller because the hours effect has a less disequalizing effect in the US.

In WE, with few exceptions, each of the effects has the same sign in all countries, but the differences in magnitude are still strong enough to lead to re-rankings. For instance, in Table 2 it appears that Luxembourg, which is the country with the lowest G_{hh}, has a similar $G_{w,t}$ index to the Netherlands, Italy and the United Kingdom (UK), while the differences in G_{hh} reaches up to five, nine and ten Gini points, respectively. The five-point gap with the Netherlands is mostly accounted for by a large difference in the "hours effect." The difference between Luxembourg and the UK is mainly accounted for by much stronger disequalizing "hours" and "other incomes" effects in the latter. In the case of Italy vs. Luxembourg, the difference in the "mating effect" accounts for the higher inequality.

With respect to LAC, the country with the lowest inequality of total household per capita income is Uruguay, so we take it as a benchmark. Figure 2 summarizes the comparisons in a

similar way than the decomposition in Figure 1. Two patterns emerge quite clearly. The first is that the "mating effect" is more equalizing in Uruguay, so part of the difference between this and the other LA countries is accounted for by lower assortative mating among couples. The second is that the "hours effect" contributes to increased inequality in Uruguay, while it is equalizing in most of the other countries, and where this is not the case, the effect is less inequality-increasing. Surprisingly, although demographic differences between Uruguay and the other LA countries are important (see Table 1), the "fertility" and "extended family" effects only account for a significant part of the inequality difference in few cases. The distribution of labor incomes represents an important part of the difference between Uruguay and the other countries, while the "other incomes" and "family income" effects play a minor role.

3.3 Differences across the World

Keeping in mind the definitional and income-source coverage differences, especially between LAC and LIS surveys, it is also illustrative to perform some comparisons across countries in different regions. Take, for instance, the case of the US and the UK. These two countries are well-known to be among the most unequal in the developed world, and the difference between their G_{hh} indexes is of about three points. However, the difference in terms of the distribution of hourly labor earnings is much larger, since the $G_{w,t}$ index is of 44.25 points in the US, while it is only 29.16 in the UK. The three effects that account for the major reduction in the gap are the "hours" and "other incomes" effects, which are much less disequalizing in the US, and the "mating effect," which has a stronger progressive impact in this country. In contrast, the difference between the US, on the one hand, and France and Germany, on the other, is practically all accounted for by the higher inequality in hourly labor earnings in the former.

Another interesting comparison is between the United States, which has a G_{hh} index of almost 40 points, and Sweden or Norway, where G_{hh} is of about 25 points. It is well known that while the Scandinavian countries have a longer tradition of social security, family allowances, labor market benefits, and other sources of public income support, in the US the level of government intervention in the process of income-formation of households is more limited. There are therefore reasons to expect that effects such as the "family income" or "other incomes" effects would play a major role in the inequality difference between these countries.

Surprisingly, about 80 and almost 90 percent of the difference between the US, and Norway and Sweden, respectively, is accounted for by differences in the distribution of labor earnings alone.

4. Other Simulation Paths

There are three caveats to which these empirical results are subject. First, the income-sharing pattern assumed so far may not be observed in reality. Some individuals who are classified as belonging to a household may in fact not share their income with other members. This is a potentially important issue,[20] but since few household surveys contain information on expenditures from which to obtain a more adequate idea of the real sharing process, we are not able to pursue this further. However, where country-specific equivalence scales are available, they can easily be used within this framework. The two other caveats, already mentioned above, are the path-dependency of our results, and the assumption of independence of each of the decisions that lead to household and income formation.

If the decisions we identify through the simulation were totally independent of each other and followed the life-cycle sequence proposed, the estimated effects would actually be regarded as an explanation of the level of inequality. However, we know that in reality income and household formation decisions are not totally independent of each other. For instance, we have not considered that male earnings might have an effect on female participation, or that a household's decisions regarding female participation, fertility, and the incorporation of adults or elderly into the unit may well be linked. It is difficult to predict the effects of these omissions because a theoretical model predicting each effect is not available, so the implication is that our results correspond to the upper bound of each individual effect. Interpreting each one purely as separate effects may be an overestimation because they may be also capturing the effect of other related decisions.

With respect to the choice of the decision-making path, we have selected a specific sequence for performing the simulations, under the argument that the sequence has empirical support, but if the sequence were modified, the magnitude of the effects would probably change. The non-uniqueness of the results is not necessarily a drawback because the simulation method can be easily adapted to other sequences by simply relaxing the assumptions in a different order.

[20] Carlson and Danziger (1999), for instance, conclude that the use of alternative sharing rules in the US has important consequences for poverty estimates.

It does not necessarily constitute a drawback for the empirical results, either, because the specific path for empirical implementation is realistic.[21] Nevertheless, there are other reasonable sequences that are worth exploring. In Table 5 we experiment with one alternative that seems reasonable to us and test whether our empirical conclusions hold under this scenario. [22]

Specifically, we assume that individuals behave more in line with collective bargaining models, rather than following a process of endogenous formation as before. Collective bargaining is similar to the case where households first pool income from all sources and individuals (columns 2 to 5 in Table 5), and then decide on the allocation by sharing or splitting household income (columns 6 to 10 in Table 5).[23] The results differ between the simulations in Tables 3 and 5, but it can be verified, for instance, that the factors driving the inequality differences across regions are mostly unmodified. The only noticeable differences are that the full "mating effect," which appeared to be more equalizing in NA than in Scandinavia in Table 3, now appears to be less equalizing in the US, and that the "fertility effect," which was less disequalizing in EE, is now more disequalizing. Although the factors driving the differences across each region as well as Scandinavia sometimes change in importance, the sign mostly remains the same. The same conclusion applies when we account for differences between the most equal country in each region and the others.

5. Conclusions

This paper takes a microeconomic approach to examine what drives differences in inequality across countries. The analysis addresses some of the limitations of the more common aggregate approach, while providing additional information about why some countries have higher

[21] Moreover, path dependency is one distinctive characteristic of other widely used methodologies. One of them is the decomposition of inequality by population subgroups, where typically an individual characteristic is chosen to compute the proportion of inequality due to within and between group differences, respectively, and then other characteristics are included sequentially to account for their effect. The effect of each characteristic always depends on the specific sequence in which it is introduced. Another example is the widely used simulation by Juhn *et al.* (1993), typically applied for decomposing changes in inequality over time. This technique decomposes the effect of changes in personal characteristics and changes in the returns to each characteristic, over the change in inequality. In this case also, the sequence in which characteristics are considered influences the magnitude of the results. Even with these limitations, path-dependency has not prevented any of these approaches from being widely applied because, as long as the path is reasonable theoretically or empirically, the results are useful.

[22] Shorrocks (1999) suggests a method to obtain path-independent results from the decomposition of inequality by population subgroups that could be implemented in our framework, but this requires a large number of simulations with different paths, which is beyond the scope of this paper.

[23] Behrman (1997), Bourguignon *et al.* (1995) and Bourguignon and Chiappori (1992) discuss these models in detail.

inequality than others. Specifically, our framework allows us to account for the importance of individual decisions such as fertility, mating, labor force participation and household structure in cross-country inequality comparisons, while at the same time presenting information about the importance of different income sources.

Strictly speaking our results can only be interpreted as uncovering the causes of inequality under special circumstances, so it is probably safer to view them as an accounting procedure that identifies what drives the differences from a statistical point of view. In any case, the simulations are useful because they are able to identify some of the channels through which differences in inequality are generated, and they help assess the noise-to-signal ratio where the data is not strictly comparable. Variables such as the years of schooling of the population, which are commonly found to be strongly correlated with inequality in aggregate cross-country regressions, may operate through these microeconomic channels (e.g., generating wage inequality, as well as differences in participation and fertility), so identifying them is crucial for policy design.

We use the simulation methodology to decompose differences in inequality of household per capita income across 35 countries from six regions. By taking Scandinavia—the region with the lowest inequality—as the benchmark we find that each of the effects we account for plays an important role in generating regional differences in inequality. Western European countries actually register lower labor market inequality than Scandinavian countries, but they end up with higher inequality in the distribution of household per capita incomes because of the role of other income sources. In contrast, most of the difference with North America surprisingly arises from labor market inequalities rather than from public transfers, unemployment benefits or other similar incomes that are linked with public compensatory mechanisms. Labor market inequalities also play an important role in accounting for the difference with respect to Latin America, Eastern Europe and Asia, but differences in fertility, mating patterns, and the importance of the extended family also play a crucial role in the inequality gap with these regions.

References

Aghion, P., Caroli, E. and García Penaloza, C. 1999. "Inequality and Economic Growth: The Perspective of New Growth Theories." *Journal of Economic Literature*. 37: 1615-1660.

Atkinson, A. and Brandolini, A. 1999. "Promise and Pitfalls in the Use of 'Secondary' Data-Sets: Income Inequality in OECD Countries." Oxford, United Kingdom and Rome, Italy: Oxford University and Banca d'Italia. Unpublished manuscript.

Attanasio, O. and Székely, M. 2000 "Household Saving in Developing Countries: Demographics, Inequality and All That." Research Department Working Paper 427. Washington, DC, United States: Inter-American Development Bank, Research Department.

Barros, R., Camargo, J., and Mendonça, R. 1995. "Poverty, Family Structure and Labor." Sao Paulo, Brazil: Istituto de Pesquisa Econômica Aplicada. Mimeograped document.

Behrman, J., 1997 "Intrahousehold Distribution and the Household." In: M.R. Rosenzweig and O. Stark, editors. *Handbook of Population and Family Economics*. Amsterdam, The Netherlands: Elsevier Science.

Behrman, J. and Deolalikar, A. 1993. "The Intrahousehold Distribution of Market Labour Supply in Rural South India." *Oxford Bulletin of Economics and Statistics*. 55 (4): 409-420.

Bergstrom, T. 1997 "A Survey of Theories of the Family." In: M.R. Rosenzweig and O. Stark, editors. *Handbook of Population and Family Economics.* Amsterdam, The Netherlands: Elsevier Science.

Bourguignon, F. and Chiappori, P. 1992. "Collective Models of Household Behavior." *European Economic Review*. 36: 355-364.

Bourguignon, F., Browning, M. and Chiappori, P. 1995. "The Collective Approach to Household Behavior." Working Paper No. 79. Turin, Italy and Oxford, United Kingdom: Centro Studi Luca D'Agliano-Queen Elizabeth House.

Cancian, M. and Reed, D. 1998. "Assessing the Effects of Wives' Earnings on Family Income Inequality." *Review of Economics and Statistics*. 80 (1): 73-80.

Carlson, M. and Danziger, S. 1999. "Cohabitation and the Measurement of Child Poverty." *Review of Income and Wealth*. 45 (2): 179-192.

Cowell, F. 1996. "Family Instability, Family Incomes and Inequality." DARP Discussion Paper 12. London, United Kingdom: London School of Economics, Distribution Analysis Research Programme.

Deininger, K. and Squire, L. 1996. "Measuring Income Inequality: A New Data Base." *World Bank Economic Review*. 10 (3): 565-91.

Fernández, R. and Rogerson, R. 2000. "Sorting and Long-Run Inequality." NBER Working Paper 7508. Cambridge, United States: National Bureau of Economic Research.

Gavin, M. and Hausmann, R. 1998. "Nature, Development and Distribution in Latin America: Evidence on the Role of Geography, Climate and Natural Resources." Research Department Working Paper 378. Washington, DC, United States: Inter-American Development Bank, Research Department.

Greenwood, J., Guner, N., and Knowles, J. 1999. "More on Marriage, Fertility, and the Distribution of Income." Rochester, United States: University of Rochester. Mimeographed document.

Haurin, D., Hendershott, P, and Dongwook, K. 1993. "The Impact of Real Rents and Wages on Household Formation." *Review of Economics and Statistics.* 75: 284-293.

Inter-American Development Bank. 1999. *Facing Up to Inequality in Latin America: Economic and Social Progress Report 1999.* Baltimore, United States: Johns Hopkins University Press.

Juhn, C., Murphy, K. and Pierce, B. 1993. "Wage Inequality and the Rise in Returns to Skill." *Journal of Political Economy*. 101 (3): 410-442.

Knowles, J. 1999. "Can Parental Decisions Explain U.S. Income Inequality?" Philadelphia, United States: University of Pennsylvania, Department of Economics. Unpublished manuscript.

Kremer, M. 1997. "How Much Does Sorting Increase Inequality?" *Quarterly Journal of Economics*. 112: 115-140.

Li., H., Squire, L and Zou, F. 1998. "Explaining International and Intertemporal Variations in Income Inequality." *Economic Journal*. 108 (446): 26-43.

Pyatt, G. 1999. "The Distribution of Living Standards within Countries: An Historical Perspective on a New International Data Base." The Hague, The Netherlands: Institute of Social Studies. Mimeographed document.

Shorrocks, A. 1982. "Inequality Decomposition by Factor Components." *Econometrica*. 50 (1): 193-211.

----. 1999. "Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value." Essex, United Kingdom: University of Essex. Mimeographed document.

Sorrentino, C. 1990. "The Changing Family in International Perspective." *Monthly Labor Review*. 113 (3): 41-58.

Squire, L. and Lundberg, M. 1999 "The Simultaneous Evolution of Growth and Inequality." Washington, DC, United States: World Bank. Mimeographed document.

Sutherland, H. 1996. "Households, Individuals and the Re-distribution of Income." DAE Working Paper 9601 (Amalgamated Series No. 9614). Cambridge, United Kingdom: University of Cambridge, Department of Applied Economics.

Székely, M. and Hilgert, M. 1999a. "What's Behind the Inequality We Measure? An Investigation Using Latin American Data." Research Department Working Paper 409. Washington, DC, United States: Inter- American Development Bank, Research Department.

Székely, M. and Hilgert, M. 1999b. “The 1990s in Latin America: Another Decade of Persistent Inequality.” Research Department Working Paper 410. Washington, DC, United States: Inter American Development Bank, Research Department.

Weiss, Y. 1997 “The Formation and Dissolution of Families: Why Marry?, Who Marries Whom?, and What Happens Upon Divorce?” In: M.R. Rosenzweig and O. Stark, editors. *Handbook of Population and Family Economics*. Amsterdam, The Netherlands: Elsevier Science.

Appendix

The LIS surveys typically report gross and net incomes, while in LAC only net incomes are available. To reduce comparability problems our international comparisons refer to net disposable incomes, although we include the inequality of gross incomes, where available, for reference.

In all surveys disposable incomes are broadly classified into: (i) sources that individuals receive directly, and with which a specific income-earner can be identified; and (ii) incomes that individuals receive because they belong to a specific household, and to which a household can be attached, but not a particular individual (see Appendix Table A2). The LIS surveys already incorporate value added through harmonization of income sources and classification into these two broad categories. The income sources for individuals in the LIS surveys are already divided into labor earned incomes, unemployment compensation, and private and public pensions, while household incomes are divided into cash property income, social transfers, means-tested transfers, private transfers and other cash incomes. The LAC surveys include a variety of sources, and if we use as reference the structure of the most complete surveys in terms of coverage, the income sources for individuals can be classified into labor earned incomes, capital incomes, property income, and transfers and pensions. When available, the incomes linked to the household rather than to individual earners are non-monetary incomes (including imputed rents in some cases), and there are only two countries (Ecuador and Peru) where other household incomes are reported as such.

Thus, the major difference is that in the LAC data it is possible to identify the individual incomes from capital, property and transfers, while in the LIS surveys these sources are not attributed to a specific individual, but to the household. Additionally, unemployment compensation is not typically included in LAC because in LA this is not an important source of income.

Another aspect is that while labor earned incomes are more homogeneous, not all surveys capture exactly the same non-labor income sources. We are able to document these differences in detail for the LAC surveys, as is apparent in Appendix Table A2, but in the case of LIS, since the data is already aggregated into the standardized categories we are not able to identify the original

income sources covered in each questionnaire. So, we are not able to guarantee comparability of non-labor income coverage for the LIS countries either.[24]

[24] Other differences across surveys, are the timing of each survey, and the level of under-reporting (Székely and Hilgert, 1999a), which we are not able to address due to the lack of information on the LIS surveys. To compute all the Gini indexes in Table 1 and in the rest of the paper we drop all missing and zero incomes to avoid introducing an element of arbitrariness into the estimation through imputation. Furthermore, we are not sure whether imputations have already been performed to the original LIS data. In most LAC countries the proportion of these observations is negligible, but in Argentina, Nicaragua and Venezuela, they account for more than 10 percent of the sample. In the LIS surveys the proportion is generally small (typically around 0.5 per cent). The only cases were the proportion exceeds 1 percent are Australia, Germany, Hungary and Russia, but even in these cases they do not exceed 5 per cent of the total observations. We use the 1998 household survey for Paraguay rather than the 1995 survey, which is also available to us, because the 1995 distribution is heavily driven by an outlier observation (see Székely and Hilgert, 1999a for details). The Gini index for Nicaragua 1998 is not identical to the index we report in Székely and Hilgert (1999b) for the same year because in that case non-monetary incomes were not available to us, and here we have included them (1999). There are also slight differences between the Gini indexes for Venezuela and Chile that we report here and the ones we report in Székely and Hilgert (1999a).

Figure 1

Decomposition of the Difference
Between Scandinavia and Each Region

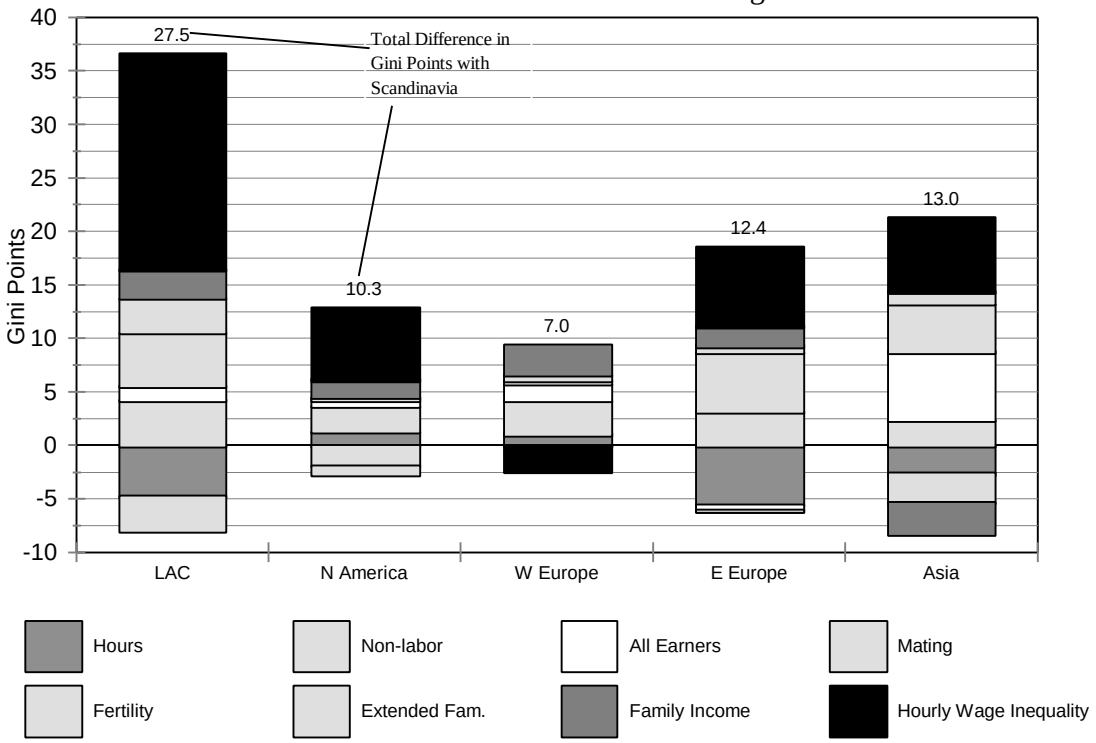

Figure 2

Decomposition of the Difference
Between Uruguay and Each LAC Country

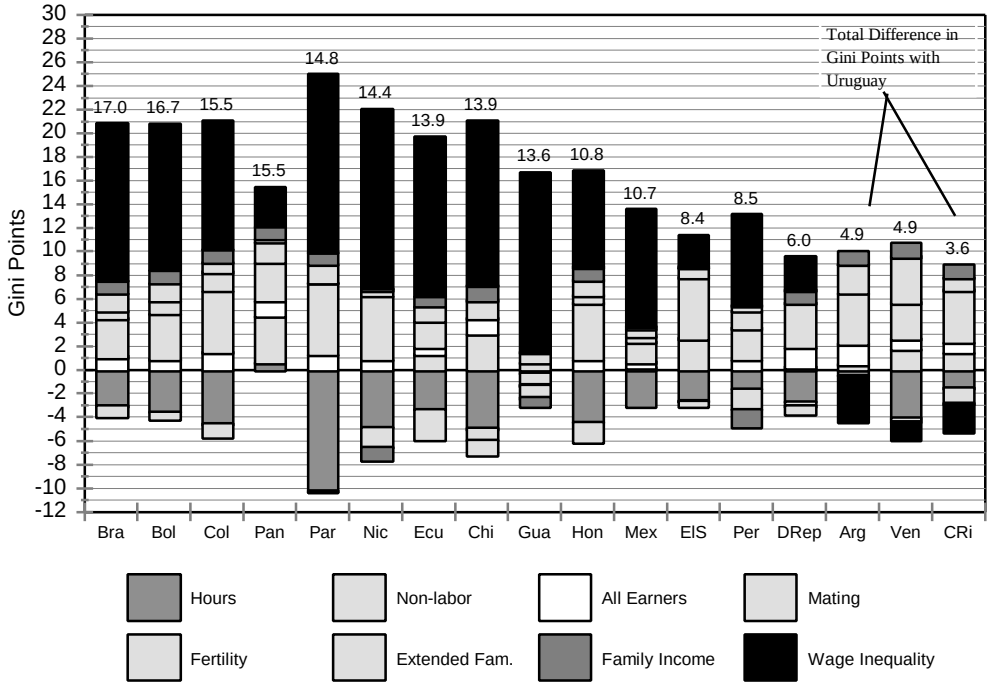

Table 1

Inequality by Income Source, Demographics and Family Arrangemen

Country		Gini Household Per capita Gross Income	Gini Household Per capita Net Income (Ghh)	Gini Index Personal incomes Labor Income (Gl)	Gini Index Personal incomes Non-labor Income (Gy)	Demographic and Family Characteristics Dependency Rate	Household Size	Female Labor Force Particip.	(%) of Singe-Person Hhlds	(%) of Nuclear Hhlds	(%) of Extended Hhlds	Gini Index Household incomes Non-Monetary	Gini Index Household incomes Various Sources
Brazil	1996		59.06	57.33	59.15	1.46	3.86	0.47	0.08	0.50	0.41		
Bolivia	1996		58.77	55.83	71.31	2.12	4.20	0.57	0.10	0.54	0.36		
Colombia	1997		57.58	53.46	57.89	1.69	4.26	0.40	0.07	0.42	0.51		
Panama	1997		57.55	51.02	69.07	1.43	4.01	0.37	0.10	0.41	0.49		
Paraguay	1998		56.92	51.91	60.33	1.88	4.67	0.62	0.08	0.45	0.47		
Nicaragua	1998		56.47	57.36		2.75	5.52	0.40	0.03	0.46	0.51	54.34	
Ecuador	1995		56.00	57.21	64.93	1.72	4.60	0.54	0.07	0.47	0.46	57.55	
Chile	1996		56.02	56.06	68.90	1.29	3.95	0.37	0.07	0.43	0.49	51.48	
Guatemala	1998		55.68	61.95	66.16	1.96	5.24	0.46	0.04	0.46	0.50	56.20	
Honduras	1996		52.84	50.70		2.66	5.31	0.40	0.04	0.43	0.53		
Mexico	1996		52.76	53.98	59.03	2.05	4.55	0.40	0.06	0.49	0.45	58.70	
El Salvador	1995		50.48	47.09	60.00	1.94	4.65	0.41	0.06	0.40	0.54	67.19	
Peru	1997		50.55	53.08		2.39	5.08	0.57	0.03	0.40	0.57	50.13	
Dominican Rep.	1996		48.10	47.15	55.25	1.85	4.29	0.28	0.06	0.42	0.53		
Argentina	1996		47.02	42.58	45.78	1.36	3.49	0.37	0.15	0.42	0.42		
Venezuela	1995		47.03	41.57	61.23	1.80	4.58	0.40	0.06	0.42	0.52		
Costa Rica	1995		45.71	42.99	55.98	1.73	4.08	0.35	0.07	0.51	0.42		
Uruguay	1995		42.09	47.02	47.02	0.82	3.20	0.49	0.16	0.39	0.44	45.18	
Avg. LAC			**52.81**	**51.57**	**60.13**	**1.83**	**4.42**	**0.44**	**0.07**	**0.45**	**0.48**	**55.10**	
USA	1994	44.04	39.79	47.61	45.65	0.21	1.87	0.65	0.38	0.39	0.18		76.10
Canada	1994	35.44	31.38	40.54	43.69	0.22	1.96	0.60	0.34	0.43	0.19		68.21
Avg. North America		**39.74**	**35.59**	**44.08**	**44.67**	**0.22**	**1.92**	**0.62**	**0.36**	**0.41**	**0.18**		**72.15**
UK	1995	39.66	36.80	36.58	46.09	0.30	1.89	0.60	0.32	0.52	0.15		59.98
Italy	1995	36.21	35.57	27.28	30.72	0.74	2.45	0.37	0.18	0.40	0.42		72.92
France	1994	34.27	32.39	40.63	44.39	0.32	1.97	0.61	0.31	0.51	0.18		57.74
Netherlands	1994	33.66	31.80	35.49	40.46	0.39	1.89	0.52	0.73	0.16	0.11		65.20
Germany	1994	34.64	30.01	39.77	37.71	0.29	1.84	0.47	0.39	0.45	0.16		67.93
Luxembourg	1994	26.94	26.94	29.17	28.63	0.56	2.14	0.43	0.25	0.50	0.25		53.52
Avg. Western Europe		**34.23**	**32.25**	**34.82**	**38.00**	**0.43**	**2.03**	**0.50**	**0.36**	**0.43**	**0.21**		**62.88**
Norway	1995	29.35	25.67	36.27	41.26	0.15	1.76	0.61	0.44	0.42	0.13		64.41
Sweden	1995	28.85	25.53	34.85	37.82	0.08	1.48	0.71	0.57	0.43	0.00		54.46
Finland	1995	29.18	24.64	37.19	36.99	0.15	1.78		0.39	0.48	0.12		52.89
Avg. Scandinavia		**29.12**	**25.28**	**36.10**	**38.69**	**0.12**	**1.68**	**0.66**	**0.47**	**0.44**	**0.08**		**57.26**
Russia	1995	45.25	45.22	48.41	21.34	0.47	2.25	0.53	0.22	0.45	0.32		67.98
Poland	1995	37.49	34.62	27.58	24.48	0.75	2.30	0.49	0.22	0.45	0.32		56.46
Hungary	1994	33.20	33.20	37.89	23.58	0.45	2.16	0.50	0.27	0.44	0.30		41.47
Avg. Eastern Europe		**38.65**	**37.68**	**37.96**	**23.13**	**0.56**	**2.24**	**0.51**	**0.24**	**0.45**	**0.31**		**55.30**
Thailand	1996	51.29	51.29	57.06	66.60	1.36	3.67	0.74	0.09	0.42	0.49	45.79	
Australia	1994	39.15	33.75	33.05	34.20	0.31	1.95	0.59	0.34	0.43	0.19		70.53
Taiwan	1995	30.27	29.87	31.08	53.76	1.00	2.96	0.49	0.09	0.42	0.49		61.88
Avg. Asia		**40.24**	**38.30**	**40.40**	**51.52**	**0.89**	**2.86**	**0.61**	**0.17**	**0.42**	**0.39**		**66.21**
Correlation with Ghh:													
Latin American Countries				0.79	0.74	0.29	0.31	0.32	-0.29	-0.38	0.56	0.41	
Other Countries				0.68	0.26	0.58	0.28	0.64	-0.47	-0.51	0.67		0.03

Source: Authors'calculations from household survey data

Table 2

Process of Income Formation for Individual Earners

Country	Gini Hourly Wages Population 15-65 Years of Age			Gini Labor Income Earners			Gini Non-labor Incomes Other Earners	Gini All Sources All Earners
				Hourly Wages	All Labor Income	Income All Sources		
	Males	Females	Male & Female	(Gw,t) **(1)**	(Gl) **(2)**	(Gy,Yl>0) **(3)**		(Gy) **(4)**
Brazil	58.33	56.76	57.95	58.47	57.33	57.67	58.02	58.47
Bolivia	57.15	56.75	57.06	57.55	55.83	55.89	65.23	57.03
Colombia	54.41	57.32	55.54	56.10	53.46	54.12	56.21	54.69
Panama	49.18	45.70	48.03	48.52	51.02	51.43	65.91	57.00
Paraguay	57.16	63.94	59.69	60.26	51.91	52.33	57.87	54.03
Nicaragua	61.52	56.85	60.13	60.34	57.36	57.36		57.36
Ecuador	59.71	56.96	58.95	58.68	57.21	56.79	65.34	59.89
Chile	55.70	61.88	57.91	59.11	56.06	56.62	67.40	61.28
Guatemala	59.94	59.13	59.86	60.34	61.95	61.00	65.80	61.74
Honduras	52.13	53.78	52.69	53.25	50.70	50.70		50.70
Mexico	55.00	52.45	54.27	55.08	53.98	53.60	56.97	55.54
El Salvador	46.69	46.95	47.16	47.82	47.09	46.15	60.92	50.60
Peru	51.89	51.30	51.88	52.85	53.08	53.08	0.00	53.08
Dominican Rep.	47.48	46.66	47.50	47.95	47.15	47.86	54.53	49.88
Argentina	42.25	38.68	41.03	41.20	42.58	43.47	43.38	45.68
Venezuela	43.01	43.32	43.13	43.74	41.57	41.59	61.56	45.06
Costa Rica	41.57	43.67	42.21	42.65	42.99	42.94	56.53	46.10
Uruguay	44.39	44.52	44.58	45.18	47.02	46.14	45.19	47.84
Avg. LAC	**52.08**	**52.03**	**52.20**	**52.73**	**51.57**	**51.60**	**55.05**	**53.66**
USA	45.26	46.04	47.18	44.25	47.61	46.38	39.67	47.97
Canada	38.02	40.47	40.44	34.25	40.54	38.05	24.30	39.35
Avg. North America	**41.64**	**43.25**	**43.81**	**39.25**	**44.08**	**42.21**	**31.98**	**43.66**
UK	31.03	36.08	35.83	29.16	36.58	35.24	37.03	42.30
Italy	26.58	26.16	27.21	28.27	27.28	26.67	29.59	30.18
France	39.48	39.60	40.54	34.30	40.63	39.02	40.90	40.63
Netherlands	28.16	38.90	35.43	26.26	35.49	34.21	51.05	35.25
Germany	35.32	38.25	39.46	35.23	39.77	37.83	28.98	37.94
Luxembourg	24.12	33.69	29.07	27.56	29.17	28.60	26.83	29.00
Avg. Western Europe	**30.78**	**35.45**	**34.59**	**30.13**	**34.82**	**33.60**	**35.73**	**35.88**
Norway*	32.75	35.09	35.77	36.27	36.27	32.73	15.27	34.03
Sweden	32.51	33.75	34.70	25.00	34.85	30.19	36.27	31.25
Finland*	36.44	35.79	36.92	37.19	37.19	32.69	11.77	32.53
Avg. Scandinavia	**33.90**	**34.88**	**35.80**	**32.82**	**36.10**	**31.87**	**21.10**	**32.60**
Russia	47.45	46.01	48.25	55.22	48.41	46.81	21.68	47.55
Poland*	27.45	25.42	27.52	27.58	27.58	27.44	24.35	27.91
Hungary	37.98	35.65	37.64	37.02	37.89	36.48	19.81	35.86
Avg. Eastern Europe	**37.63**	**35.70**	**37.80**	**39.94**	**37.96**	**36.91**	**21.95**	**37.11**
Thailand*	55.67	58.06	56.60	57.06	57.06	53.94	68.93	58.48
Australia	29.41	35.00	33.03	28.22	33.05	31.91	18.87	36.78
Taiwan	28.85	28.86	31.02	32.97	31.08	29.70	49.86	41.96
Avg. Asia	**37.98**	**40.64**	**40.22**	**39.42**	**40.40**	**38.52**	**45.89**	**45.74**
Correlation with Ghh:								
Latin American Countries	0.82	0.75	0.81	0.81	0.76	0.79	0.63	0.81
Other Countries	0.70	0.66	0.69	0.77	0.68	0.76	0.49	0.79

Source: Authors'calculations from household survey data

*Information on hours worked is not available for this survey.

Table 3

Gini Index in the Process of Endogenous Family Formation

Country	Gini All Sources All Earners (Gy) **(4)**	Mating Effect: Match all spouses with income (Ghs,Ys>0) **(5a)**	Mating Effect: Match all spouses (Ghs) **(5b)**	Fertility Effect: Match couples with Working Children (Ghsc,Yc>0) **(6a)**	Fertility Effect: All Couples w/Children (Nuclear) (Ghsc) **(6b)**	Extended Family Effect: Match Nuclear Family with working adults (Ghsca, Ya>0) **(7a)**	Extended Family Effect: All Nuclear w/ any Adult (Ghsca) **(7b)**	Elderly Effect: Extended Family w/working Elderly (Ghscae,Ye>0) **(8a)**	Elderly Effect: Extended Family with all Elderly (Ghscae) **(8b)**	Household Income Effect (Ghh) **(9)**
Brazil	58.47	56.99	57.63	56.04	61.64	59.11	59.35	59.08	59.07	
Bolivia	57.03	55.28	56.82	56.32	61.31	59.28	58.88	58.82	58.77	
Colombia	54.69	53.67	55.76	54.66	60.88	57.98	57.84	57.78	57.58	
Panama	57.00	55.74	56.22	55.37	61.41	57.89	57.76	57.59	57.55	
Paraguay	54.03	52.87	56.01	52.72	59.51	56.88	57.19	56.97	56.92	
Nicaragua	57.36	56.39	58.65	56.88	62.68	59.07	58.93	58.78	58.68	56.47
Ecuador	59.89	57.76	58.15	55.05	59.07	56.07	56.23	56.18	56.21	56.00
Chile	61.28	59.41	58.76	57.56	61.18	56.30	56.25	55.89	55.85	56.02
Guatemala	61.74	58.97	56.69	56.51	60.77	57.99	58.12	57.62	57.58	55.68
Honduras	50.70	49.32	51.51	50.09	55.61	53.06	52.97	52.95	52.84	
Mexico	55.54	52.87	53.20	51.41	57.11	53.92	53.69	53.63	53.61	52.76
El Salvador	50.60	48.90	51.70	48.90	55.86	51.84	51.78	51.54	51.39	50.48
Peru	53.08	51.56	51.74	51.26	56.54	53.60	53.13	53.06	53.01	50.55
Dominican Rep.	49.88	47.92	49.67	46.68	52.77	48.24	48.20	48.14	48.10	
Argentina	45.68	44.53	45.87	44.20	51.73	47.95	48.05	47.69	47.71	
Venezuela	45.06	43.99	44.11	43.75	51.45	47.05	46.76	46.71	47.03	
Costa Rica	46.10	44.82	46.65	44.37	48.81	45.84	45.86	45.71	45.70	
Uruguay	47.84	44.60	43.81	42.77	47.24	43.62	43.88	43.18	43.16	42.09
Avg. LAC	**53.66**	**51.98**	**52.94**	**51.36**	**56.98**	**53.65**	**53.60**	**53.41**	**53.38**	**53.66**
USA	47.97	44.01	40.39	41.14	41.38	40.18	40.60	40.57	40.59	39.79
Canada	39.35	35.60	31.93	32.72	32.88	31.68	32.25	32.13	32.16	31.38
Avg. North America	**43.66**	**39.80**	**36.16**	**36.93**	**37.13**	**35.93**	**36.42**	**36.35**	**36.38**	**35.59**
UK	42.30	38.58	37.14	36.81	37.34	36.55	37.02	37.06	37.06	36.80
Italy	30.18	29.70	30.59	30.39	31.63	30.31	32.42	32.30	32.38	35.57
France	40.63	37.10	35.25	36.27	36.40	35.88	36.36	36.35	36.35	32.39
Netherlands	35.25	31.93	27.12	28.51	29.63	29.05	29.71	29.72	29.75	31.80
Germany	37.94	33.09	28.34	29.12	29.47	28.77	29.15	29.08	29.08	30.01
Luxembourg	29.00	26.93	25.41	24.94	27.29	26.38	26.91	26.88	26.89	26.94
Avg. Western Europe	**35.88**	**32.89**	**30.64**	**31.01**	**31.96**	**31.16**	**31.93**	**31.90**	**31.92**	**32.25**
Norway	34.03	31.06	27.31	28.43	28.36	27.59	27.89	27.88	27.89	25.67
Sweden	31.25	27.95	26.79	26.97	27.30	27.30	27.30	27.30	27.30	25.53
Finland	32.53	30.26	26.84	28.02	27.75	27.86	28.15	28.14	28.14	24.64
Avg. Scandinavia	**32.60**	**29.76**	**26.98**	**27.81**	**27.80**	**27.58**	**27.78**	**27.77**	**27.78**	**25.28**
Russia	47.55	46.13	44.12	45.01	44.84	44.05	45.29	44.90	44.94	45.22
Poland	27.91	28.43	29.34	29.14	31.23	31.15	33.14	33.68	33.92	34.62
Hungary	35.86	35.00	37.58	35.77	37.26	35.48	36.87	36.17	36.23	33.20
Avg. Eastern Europe	**37.11**	**36.52**	**37.01**	**36.64**	**37.78**	**36.89**	**38.43**	**38.25**	**38.37**	**37.68**
Thailand	58.48	56.22	57.37	55.45	59.46	55.18	54.96	54.87	54.80	51.29
Australia	36.78	34.87	32.78	33.26	34.75	33.10	33.37	33.39	33.46	33.75
Taiwan	41.96	39.99	43.32	42.26	45.49	42.48	43.04	42.94	43.22	29.87
Avg. Asia	**45.74**	**43.69**	**44.49**	**43.66**	**46.57**	**43.59**	**43.79**	**43.73**	**43.83**	**38.30**
Correlation with Ghh:										
Latin American Countries	0.84	0.89	0.94	0.95	0.97	0.98	0.98	0.99	0.99	
Other Countries	0.79	0.85	0.84	0.85	0.84	0.86	0.88	0.88	0.88	

Source: Authors'calculations from household survey data

Table 4

Correlation Coefficients in the Process of Endogenous Family Formation

Country	Hourly Wages & Hours	Mating Effect: Years of Schooling Head & Spouse	Mating Effect: Income Head & Spouse Earners	Mating Effect: Income Head & all Spouses	Fertility Effect: Income Head & Children Earners	Fertility Effect: Income Head & all Children (Nuclear)	Extended Family Effect: Income Head & Adult Earners	Extended Family Effect: Income Head & all Adult (Extended)	Elderly Effect: Income Head & Elderly Earners	Elderly Effect: Income Head & all Elderly
Brazil	-0.10	0.59	0.53	0.37	0.24	0.01	0.28	0.20	0.25	0.19
Bolivia	-0.16	0.68	0.35	0.27	0.10	-0.01	0.33	0.22	0.34	0.20
Colombia	-0.02	0.58	0.03	0.02	0.12	-0.01	0.01	0.14	0.34	0.20
Panama	-0.08	0.47	0.51	0.40	0.26	0.02	0.29	0.17	0.11	0.11
Paraguay	-0.08	0.27	0.36	0.29	0.18	0.02	0.12	0.19	0.42	0.20
Nicaragua	-0.04	0.57	0.50	0.36	0.26	-0.00	0.38	0.24	-0.24	-0.06
Ecuador	-0.18	0.60	0.51	0.37	0.17	-0.02	0.19	0.14	0.51	0.38
Chile	-0.12	0.60	0.27	0.08	-0.01	-0.00	0.15	0.14	0.32	0.14
Guatemala	-0.06	0.65	0.42	0.37	0.18	-0.03	0.23	0.15	0.20	0.02
Honduras	-0.16	0.58	0.45	0.27	0.08	-0.06	0.18	0.07	0.33	0.01
Mexico	-0.10	0.62	0.36	0.07	0.07	-0.04	0.21	0.11	0.26	0.05
El Salvador	-0.15	0.62	0.43	0.24	0.13	-0.04	0.17	0.05	0.39	0.08
Peru	-0.14	0.62	0.45	0.20	0.06	-0.01	0.15	0.08	0.24	-0.04
Dominican Rep.	-0.14	0.52	0.42	0.26	0.11	-0.02	0.15	0.08	0.41	0.29
Argentina	-0.19	0.44	0.46	0.29	0.16	0.03	0.20	0.05	0.08	0.13
Venezuela	-0.13	0.55	0.34	0.18	0.09	-0.03	0.27	0.16	0.22	0.03
Costa Rica	-0.16	0.50	0.47	0.24	0.00	-0.08	0.19	0.07	0.47	0.29
Uruguay	-0.11	0.46	0.34	0.20	0.14	-0.02	0.17	0.10	0.16	0.13
Avg. LAC	**-0.12**	**0.55**	**0.40**	**0.25**	**0.13**	**-0.02**	**0.20**	**0.13**	**0.27**	**0.13**
USA	0.05	0.28	0.22	0.13	-0.05	-0.01	0.03	0.06	0.27	0.22
Canada	-0.06	0.22	0.20	0.14	-0.03	-0.00	0.02	0.06	0.10	0.04
Avg. North America	**-0.00**	**0.25**	**0.21**	**0.13**	**-0.04**	**-0.01**	**0.03**	**0.06**	**0.18**	**0.13**
UK	-0.03		0.25	0.18	-0.02	0.03	0.09	0.14	0.09	0.09
Italy	-0.34	0.59	0.32	0.21	-0.06	-0.07	0.05	0.00	0.18	0.15
France	0.02	0.47	0.32	0.16	-0.09	-0.06	-0.10	-0.05	0.02	0.01
Netherlands	0.08	0.20	0.07	0.05	-0.10	-0.02	0.01	0.08	-0.03	0.08
Germany	-0.06	0.33	-0.08	-0.13	-0.11	-0.08	-0.12	-0.07	0.26	0.26
Luxembourg	-0.26	0.33	0.33	0.11	0.21	-0.09	0.08	-0.07	0.05	0.02
Avg. Western Europe	**-0.10**	**0.39**	**0.20**	**0.10**	**-0.03**	**-0.05**	**0.00**	**0.01**	**0.09**	**0.10**
Norway	0.00	0.27	0.21	0.19	-0.06	-0.04	-0.11	-0.05	0.08	0.19
Sweden	0.16	0.34	0.26	0.26	0.05	0.09	0.85	0.85	0.00	0.00
Finland	0.00	0.25	0.25	0.27	0.00	-0.00	0.16	0.18	0.29	0.29
Avg. Scandinavia	**0.05**	**0.29**	**0.24**	**0.24**	**-0.01**	**0.02**	**0.30**	**0.33**	**0.12**	**0.16**
Russia	-0.16	0.41	0.24	0.17	0.35	0.14	0.15	0.09	0.16	0.20
Poland	0.00	0.30	0.20	0.22	0.27	-0.00	0.21	0.13	0.27	0.09
Hungary	-0.16	0.43	0.44	0.38	0.05	-0.03	0.01	0.01	0.15	0.14
Avg. Eastern Europe	**-0.11**	**0.38**	**0.29**	**0.26**	**0.22**	**0.03**	**0.12**	**0.08**	**0.19**	**0.14**
Thailand	0.00	0.56	0.30	0.12	0.07	-0.01	0.17	0.04	0.44	0.06
Australia	-0.10		0.26	0.23	-0.07	-0.01	0.06	0.09	-0.03	-0.07
Taiwan	-0.25	0.46	0.33	0.28	0.05	-0.04	0.08	0.03	0.08	0.02
Avg. Asia	**-0.12**	**0.51**	**0.29**	**0.21**	**0.02**	**-0.02**	**0.10**	**0.05**	**0.16**	**0.00**

Source: Authors'calculations from household survey data

Table 5

Gini Index in the Process of Family Formation Through "pooling" & "sharing"

Country	Gini All Sources All Earners (Gy) **(4)**	Income Pooling Effect: Match Working Couples (Ghs,Ys>0)	Couples w/ Working Children (Ghsc,Yc>0)	Nuclear Family w/Working Adults (Ghsca,Ya>0	Nuclear Family w/Adults & w/Working Elderly (Ghscae,Ye>0)	Income Splitting Effect: Match all couples (Ghs)	All Couples w/Children (Nuclear) (Ghsc)	All Nuclear w/ any Adult (Ghsca)	Nuclear Family w/Adults & w/any Elderly (Ghscae)	Household Income Effect
Brazil	58.47	56.99	55.96	54.44	54.16	60.35	61.43	59.25	59.07	
Bolivia	57.03	55.45	54.64	53.36	53.27	58.01	60.35	58.97	58.77	
Colombia	54.69	53.67	53.02	51.59	51.49	59.19	60.51	57.81	57.58	
Panama	57.00	55.74	54.40	52.19	51.94	59.04	60.76	57.55	57.55	
Paraguay	54.03	52.87	51.70	50.05	49.90	58.07	58.85	57.09	56.92	
Nicaragua	57.36	56.39	55.95	54.59	54.53	62.14	63.31	58.93	58.68	56.47
Ecuador	59.89	57.76	54.72	51.74	51.52	60.38	58.98	56.23	56.21	56.00
Chile	61.28	59.41	58.07	55.78	55.47	61.77	60.93	56.11	55.85	56.02
Guatemala	61.74	58.97	56.94	55.05	54.70	61.56	60.57	57.86	57.58	55.68
Honduras	50.70	49.32	49.24	48.06	48.01	54.58	55.47	52.98	52.84	
Mexico	55.54	52.87	52.21	50.73	50.64	57.07	57.36	53.66	53.61	52.76
El Salvador	50.60	48.90	48.32	46.35	46.11	55.49	55.51	51.67	51.39	50.48
Peru	53.08	51.56	50.88	47.85	47.80	54.15	56.02	53.14	53.01	50.55
Dominican Rep.	49.88	47.92	46.85	44.22	44.05	52.76	52.59	48.10	48.10	
Argentina	45.68	44.53	43.93	42.33	41.82	48.73	51.54	47.95	47.02	
Venezuela	45.06	43.99	42.98	40.57	40.46	49.23	51.29	46.77	47.03	
Costa Rica	46.10	44.82	43.69	41.96	41.57	51.08	49.00	45.77	45.70	
Uruguay	47.84	44.60	43.55	41.11	40.32	47.98	47.75	43.78	43.16	42.09
Avg. LAC	**53.66**	**51.99**	**50.95**	**49.00**	**48.76**	**56.20**	**56.79**	**53.53**	**53.34**	
USA	47.97	43.83	41.77	40.11	39.97	42.88	43.05	40.65	40.47	39.79
Canada	39.35	35.60	33.06	31.36	31.25	34.79	34.79	32.44	32.16	31.38
Avg. North America	**43.66**	**39.71**	**37.41**	**35.74**	**35.61**	**38.84**	**38.92**	**36.55**	**36.31**	**35.59**
UK	42.30	36.78	35.98	35.35	35.31	37.29	37.00	35.76	35.54	36.80
Italy	30.18	29.70	29.58	28.68	28.62	34.10	33.93	32.56	32.38	35.57
France	40.63	37.10	36.28	34.96	34.90	37.19	37.67	36.60	36.35	32.39
Netherlands	35.25	31.93	30.31	29.64	29.65	28.61	30.03	29.73	29.75	31.80
Germany	37.94	33.33	32.52	31.34	31.30	31.37	31.99	30.11	29.83	30.01
Luxembourg	29.00	26.93	26.83	26.33	26.14	29.82	30.79	27.34	26.89	26.94
Avg. Western Europe	**35.88**	**32.63**	**31.92**	**31.05**	**30.99**	**33.06**	**33.57**	**32.02**	**31.79**	**32.25**
Norway	34.03	28.99	26.42	25.29	25.30	27.76	27.99	26.40	26.33	25.67
Sweden	31.25	27.95	26.63	26.63	26.63	26.91	27.30	27.30	27.30	25.53
Finland	32.53	30.26	27.49	27.07	27.04	28.62	29.05	28.68	28.14	24.64
Avg. Scandinavia	**32.60**	**29.07**	**26.85**	**26.33**	**26.32**	**27.76**	**28.11**	**27.46**	**27.26**	**25.28**
Russia	47.55	46.13	45.85	44.26	43.96	46.97	47.11	45.68	44.94	45.22
Poland	27.91	28.43	28.47	28.69	29.19	30.90	32.24	33.33	33.92	34.62
Hungary	35.86	33.86	33.66	39.76	38.62	36.92	36.23	39.66	36.23	33.20
Avg. Eastern Europe	**37.11**	**36.14**	**35.99**	**37.57**	**37.26**	**38.26**	**38.53**	**39.56**	**38.37**	**37.68**
Thailand	58.48	53.39	53.33	58.90	59.18	54.94	54.80	50.23	54.80	51.29
Australia	36.78	34.87	33.11	31.87	31.82	36.09	36.57	33.54	33.46	33.75
Taiwan	41.96	39.60	39.34	37.21	36.86	47.88	47.52	42.81	42.92	29.87
Avg. Asia	**45.74**	**42.62**	**41.93**	**42.66**	**42.62**	**46.30**	**46.30**	**42.19**	**43.72**	**38.30**
Correlation with Ghh:										
Latin American Countries	0.84	0.89	0.91	0.93	0.93	0.92	0.96	0.98	0.99	
Other Countries	0.79	0.86	0.88	0.88	0.89	0.80	0.81	0.84	0.87	

Source: Authors'calculations from household survey data

Appendix Table A1

Data Sources

	Country	Year	Source	Name of the survey
1	Argentina	96	LAC	Encuesta Permanente de Hogares
2	Bolivia	96	LAC	Encuesta Nacional de Empleo
3	Brazil	97	LAC	Pesquisa Nacional por Amostra de Domicilios
4	Chile	96	LAC	Encuesta de Caracterización Socioeconómica Nacional
5	Colombia	97	LAC	Encuesta Nacional de Hogares - Fuerza de Trabajo
6	Costa Rica	97	LAC	Encuesta de Hogares de Propósitos Múltiples
7	Dominican Rep.	96	LAC	Encuesta Nacional de Fuerza de Trabajo
8	Ecuador	95	LAC	Encuesta de Condiciones de Vida
9	El Salvador	97	LAC	Encuesta de Hogares de Propósitos Múltiples
10	Guatemala	98	LAC	Encuesta Nacional de Ingresos y Gastos Familiares
11	Honduras	96	LAC	Encuesta Permanente de Hogares de Propósitos Múltiples
12	Mexico	96	LAC	Encuesta Nacional de Ingreso Gasto de los Hogares
13	Nicaragua	98	LAC	Encuesta Nacional de Hogares Sobre Medicion de Niveles de Vida
14	Panama	97	LAC	Encuesta de Hogares
15	Paraguay	95	LAC	Encuesta de Hogares - Mano de Obra
16	Peru	97	LAC	Encuesta Nacional de Hogares sobre Niveles de Vida y Pobreza
17	Uruguay	97	LAC	Encuesta Continua de Hogares
18	Venezuela	97	LAC	Encuesta de Hogares por Muestra
19	Thailand	96	LAC	Socio-Economic Survey
20	Australia	94	LIS	Australian Income and Housing Survey
21	Canada	94	LIS	Survey of Consumer Finances
22	Finland	95	LIS	Income Distribution Survey
23	France	94	LIS	Family Budget Survey
24	Germany	94	LIS	German Social Economic Panel Study
25	Hungary	94	LIS	Hungarian Income Survey
26	Italy	95	LIS	The Bank of Italy Survey
27	Luxembourg	94	LIS	The Luxembourg Household Panel Study
28	Netherlands	94	LIS	Socio-Economic Panel
29	Norway	95	LIS	Income and Property Distribution Survey
30	Poland	95	LIS	Household Budget Survey
31	Taiwan	95	LIS	Survey of Personal Income Distribution Survey
32	Russia	95	LIS	Russian Longitudinal Monitoring Survey
33	Sweden	95	LIS	Income Distribution Survey
34	United Kingdom	95	LIS	The Family Expenditure Survey
35	United States	94	LIS	March Current Population Survey

LIS refers to data processed through the Luxembourg Income Study

LAC refers to data processed by Székely and Hilgert with direct access to the household survey data.

Appendix Table A2

Income Source Coveratge

Country	Individual Income Sources					Household Income Sources						
						LAC		LIS				
	Labor	Property Rent	Capital Rent	Transfers & Pensions	Unemp't Compen.	Non-Monetary	Imputed Rent	Cash property income	Other social ins. transfers	Total means tested inc.	Total private transfers	Other cash income
Argentina	X	Xb	Xb	Xb								
Bolivia	X	X	X	X								
Brazil	X	X	Xc	X								
Chile	X	X	X	X		X	X					
Colombia	X	Xa	Xa	X		X						
Costa Rica	X	Xb	Xb	Xb								
Dominican Rep.	X	X	X	X								
Ecuador	X			X		X	X	X	X			X
El Salvador	Xd	Xb	Xb	Xb		Xd	X					
Guatemala	X	X	X	X		X	X					
Honduras	X											
Mexico	X	X	X	X		X	X					
Nicaragua	X					X						
Panama	X	Xa	Xa	X								
Paraguay	X	X	X	X		Xd						
Peru	X			X		X	X	X	X		X	
Uruguay	X	X	X	X		X	X					
Venezuela	X	Xb	Xb	Xb								
Thailand	X	X	X	X		X	X					
Australia	X			X	X			X	X	X	X	X
Canada	X			X	X			X	X	X		X
Finland	X			X	X			X	X	X	X	X
France	X			X	X			X	X	X	X	X
Germany	X			X	X			X	X	X	X	
Hungary	X			X	X			X	X	X	X	X
Italy	X			X	X			X	X	X	X	X
Luxembourg	X			X	X			X	X	X	X	
Netherlands	X			X	X			X	X	X	X	X
Norway	X			X	X			X	X	X	X	X
Poland	X			X	X			X	X	X	X	X
Taiwan	X			X				X		X	X	X
Russia	X			X	X			X	X	X	X	
Sweden	X			X	X			X	X	X	X	
United Kingdom	X			X	X			X	X	X	X	X
United States	X			X	X			X	X	X	X	X

a. Can not separate between property and capital rent.

b. Can not separate between property rent, capital rent, and transfers.

c. Can not separate capital rent from other sources.

d. Can not separate nonmonetary income from labor income.

e. Nonmonetary income available only for urban areas

Appendix Table A3

Sources of Income in Each Household Survey
(% of Total Income)

Country		Income Sources for Individuals		Income Sources at the Household level	
		Labor Income	Non-Labor Income	Non-Monetary Income	Family Income
Brazil	1996	81.13	18.87		
Bolivia	1996	84.39	15.61		
Colombia	1997	85.69	14.31		
Panama	1997	74.76	25.24		
Paraguay	1998	88.47	11.53		
Nicaragua	1998	90.94		9.06	
Ecuador	1995	76.26	4.10	7.96	11.68
Chile	1996	77.92	12.31	9.92	
Guatemala	1998	72.50	12.27	15.05	
Honduras	1996	100.00			
Mexico	1996	65.43	10.55	24.02	
El Salvador	1995	88.66	7.56	3.91	
Peru	1997	69.20		13.95	16.85
Dominican Rep.	1996	81.93	18.07		
Argentina	1996	82.23	18.10		
Venezuela	1995	93.12	6.88		
Costa Rica	1995	88.30	11.70		
Uruguay	1995	58.25	24.84	16.91	
Avg. LAC		**81.07**	**14.13**		
USA	1994	75.52	13.67		10.81
Canada	1994	71.09	16.97		11.94
Avg. North America		**73.31**	**15.32**		**11.37**
UK	1995	63.98	16.73		19.29
Italy	1995	65.09	26.28		8.63
France	1994	61.14	25.54		13.32
Netherlands	1994	57.07	24.44		18.49
Germany	1994	67.08	23.57		9.36
Luxembourg	1994	68.32	19.26		12.42
Avg. Western Europe		**63.78**	**22.64**		**13.58**
Norway	1995	64.57	19.22		16.21
Sweden	1995	45.12	34.13		20.74
Finland	1995	50.27	31.43		18.30
Avg. Scandinavia		**53.32**	**28.26**		**18.42**
Russia	1995	68.84	18.62		12.54
Poland	1995	56.72	21.40		21.88
Hungary	1994	60.78	22.29		16.92
Avg. Eastern Europe		**62.11**	**20.77**		**17.11**
Thailand-RES	1996	70.99	15.70	12.88	
Australia	1994	78.98	8.50		12.52
Taiwan-RES	1995	81.59	5.89		12.52
Avg. Asia		**77.19**	**10.03**		**12.52**

Source: Authors' calculations from household survey data