

# The “Marriage Gap” and the Well-Being of Households and Children

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## Abstract

The distribution of the Colombian population according to marital status has changed dramatically during the past decades, and this has happened in different ways across the income distribution. When in marital unions, people in lower income groups tend to prefer cohabitation over marriage more often than people in the upper part of the income distribution. If differences in well-being exist between married and cohabiting households, these trends have potentially adverse feedback effects on the income distribution. In this paper we evaluate whether there are, in fact, differences in adult and child outcomes between cohabiting and married households, once differences in demographics and other observable characteristics are controlled for and possible endogeneity biases due to selection issues are taken into account. We find that cohabiting households are in fact worse-off in various dimensions including home ownership, ownership of durable goods, earnings, and child outcomes such as schooling and cognitive and non-cognitive tests. In addition, we attempt to understand the reason why these differences arise and find evidence that cohabiting households exhibit less stable and forward looking behaviors and are characterized by less income sharing and specialization within the household.

## 1. Introduction

The distribution of the Colombian population by marital status has changed significantly over the past two decades. Consistent with what has happened in most parts of the world, the fraction of married individuals has declined while the fraction of divorced or single has increased. For example, the fraction of married individuals between the ages of 25 and 45 declined from 57.3% in 1982 to 28.8% in 2006, while the fraction of divorced in the same age range increased from 6.5% to 11.5%. In addition, while marriage has been declining, the fraction of cohabiting couples has been increasing dramatically going from 12% in 1982 to 30.5% in 2006. Perhaps more interesting are the differences in these trends across the income distribution and by education level.

In Figure 1 we show the distribution of households by marital status and income quintile from 1982 to 2006. As can be observed, marriage has declined while cohabitation and divorce have increased for all groups. However, it is clear that the way in which this has happened differs significantly across the income distribution. The decline in marriage rates has been more noticeable among the poorest. While marriage rates declined 54% among households in the lowest income quintile from 1982 to 2006, this decline was around 32% among households in the highest income quintile. This difference is stronger among households with children younger than 18. In particular, the fraction of married households with children declined 58% among the poorest from 1982 to 2006 while it fell only about 20% among the richest.

Two-parent households (with children), both married and cohabiting, have decreased significantly more in the lower part of the distribution than in the upper part, while one-parent households have increased disproportionately more among the poorest than among the richest. For example, the fraction of two-parent households in the lowest income quintile decreased by 21% between 1982 and 2006 while this reduction was only about 4.4% among households in the highest income quintile. On the other hand, the fraction of one-parent households (divorced, single and widowed) increased 140% among the poorest households while it increased 15% among households in the fourth income quintile and 41% among households in the highest income quintile between 1982 and 2006.

Notably, households in the middle portion of the distribution (third and fourth quintile) have moved from looking like the top quintile to looking more like the bottom quintile, in terms of significantly lower fractions of married households, and significantly higher proportions of cohabiting and divorced households. Something similar happens in the case of households with children under 18 (see Figure 2).

Note that by 2006, the highest fraction of households with children by marital status in the lowest income quintile were those cohabiting (39%), followed by married (29%) and divorced (22%). Something similar happens in the second and third income quintiles of the distribution. For example, among households in the third quintile, the fraction of both,

cohabiting and married households is around 40%, and about 11% are divorced. On the other hand, most households with children in the highest income quintile are married (67%), while 19% are cohabiting and only about 9% divorced. It is clear then that there is a widening gap between how the poorest and richest approach marriage and child-rearing. Most importantly, households in the middle of the distribution now resemble more the bottom part of the distribution than the upper part of the distribution.

This matters to the extent that marital status is correlated with measures of well-being of households and/or their children. This is clear if we compare, for example, two-parent households with one-parent households. It is well documented that individuals and children are significantly better off living in two-parent households than in one-parent households simply because two-parent households are composed by two potential wage earners as opposed to only one. Thus, household income and household income per capita are both lower in one-parent households. This, in turn, is associated with higher probabilities of hardship. Evidence suggests that children born and raised in two-parent households do better in school, get better jobs and have higher probabilities of creating intact families of their own. This would imply that those born near the top distribution will stay there.

On the other hand, it is less clear whether the relative increase in the number of cohabiting households at the bottom and middle of the distribution with respect to married households should be a matter of concern. The fraction of two-parent households, whether it is married or cohabiting, in the third quintile is around 77% while this fraction is 86% at the top of the distribution. Although there is still a significant difference, it is not as dramatic as if one compared only the fraction of legally married households (38% vs. 68%).

In principle, if two-parent households have an advantage over one-parent households due to the presence of two potential wage earners, then the distinction between cohabitation and marriage should not have a significant impact on the well-being of individuals and children in these two types of households. In Table 1 we show differences between households by marital status in terms of size, number of children and income per capita. As it can be observed, household size appears to be smaller among cohabiting households along the entire income distribution with the exception of the poorest, although the difference between one and the other is not statistically significant at the aggregate level (being around 4 household members). In addition, married households have fewer children under 18 than cohabiting households although this difference is not statistically significant in the upper part of the income distribution.

On the other hand, income per capita (by income quintile) does not seem to be significantly different between cohabiting and married households (see panel c. in Table 1) with the exception of households in the fourth and fifth income quintiles, although the latter difference does not turn out to be statistically significant. In sum, although cohabiting and married households seem to be different in terms of size there does not appear to be a significant difference in income per capita which would imply that the distinction between

cohabitation and marriage might not have a significant impact on the well-being of household members and children.

In this paper, we assess whether there exist significant differences in adult and child outcomes between married and cohabiting households in Colombia. There is some evidence<sup>1</sup> that in spite of the fact that both types of households are composed by two potential wage earners there are important differences in economic well-being and children's outcomes in favor of married families. We then attempt to understand the reasons why this is the case. This is relevant in the sense that if cohabiting households are worse-off than married households, then the recent trends in marital status by income are a reason for concern as this might feedback into a worsening of the income distribution.

The results indicate that, in fact, cohabiting households are worse-off than married households in various dimensions including home ownership, ownership of durable goods, earnings, and child outcomes such as schooling and cognitive and non-cognitive tests. In particular, after controlling by the fact that cohabiting households are systematically different from married households in observed characteristics such as education and income, there still exist significant differences in detriment of cohabiting households. This conditional difference might be biased because cohabiting individuals might be different from married individuals in ways that we cannot measure or observe such as attitudes, abilities or circumstances.

It is possible, for example, that people with characteristics associated with higher well-being are also those who tend to marry and stay married, such as, planning for the future, good interpersonal skills, less risk aversion, more commitment and perseverance, etc. That would imply that the impact of marriage on outcomes might be upwardly biased due to the selection issue. It is also possible, however, that the bias goes in the opposite direction. In other words, it is possible that people who choose to live together before marriage are more cautious, less risk-taking, less impulsive, more career-oriented than family-oriented, care more about themselves than other people and other characteristics that might be associated with higher well-being. In this case, the effect of marriage would be downwardly biased. For this reason, we attempt to estimate a causal effect by using instrumental variables and estimating a selection-correction model in which the marital status decision is estimated jointly with the outcome equation (e.g. adult and child outcomes).

The results indicate that there are important differences between married households and cohabiting households in detriment of the latter along various dimensions of well-being. These correspond to outcomes at the household level such as durable good ownership and also, adult and child outcomes, such as non-labor income, average hourly wage rates and schooling and health child outcomes. Some of these differences persist even after conditioning by household income and/or educational attainment of the head of the

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<sup>1</sup> Both international and national (see Ribero, 2001 and Flórez, 2004).

household. In addition, we find that most of the unconditional differences between married households and cohabiting households persist even after controlling for observed characteristics of the household such as age and schooling of the head of household, household income and size, labor status of the head of the households and city fixed effects, and unobserved characteristics of the household, by using instrumental variables. In particular, we have shown that there are important differences in durable goods ownership, male and female hourly wages, non-labor income, children's schooling, cognitive development and socio-emotional development. Some other differences, such as children's health and nutrition, can be accounted for by differences in household income, education of the head of the household and other differences in observed characteristics between cohabiting households and married households.

In exercises that explore the reasons why these differences might emerge we find that it is plausible to think that cohabiting relationships are less stable than marriages and thus entail a more uncertain environment in which participants have lower incentives to invest in their partner, their children and the future in general. In the U.S., for example, cohabiting relationships last about two years on average, only about half of them end in marriage and individuals who live together before marriage are more likely to divorce. We provide evidence that men and women in cohabiting households exhibit less stable and forward looking behavior and that income sharing and specialization within the household are less likely in cohabiting relationships than within marriage.

This paper is organized as follows. In Section 2 we present a theoretical discussion of the reasons why one should expect individuals and children to be better off in two-parent households than in one-parent households and discuss the theoretical reasons why marriage would be associated with higher welfare than cohabitation. In addition, we present a brief review of the literature. In Section 3 we present some descriptive evidence that cohabiting households are worse-off than married households in various dimensions. In Section 4 we estimate the marital status decision jointly with the outcome equation and make use of instrumental variables in order to estimate a causal effect that corrects by the fact that people that decide to marry are systematically different from individuals that decide to live together without legally marrying in unobserved ways. In Section 5 we assess the existence of heterogeneous effects of marriage and in Section 6 we explore empirically some of the potential explanations why cohabitation exhibits a negative effect compared to marriage on several adult and child outcomes. Finally, in Section 7 we conclude.

## **2. Literature Review**

A vast line of literature starting with Becker (1981) has outlined the reasons why individuals and children in particular might be better-off in two-parent households than in one-parent households. The arguments can be easily summarized as follows.

First, there are obvious economies of scale in two-parent households vs. one-parent households (Becker, 1981). This means that two adults can live more cheaply than if they lived in two separate households. In Figure 3 we show average household expenses by number of adults in households with one child. The numbers presented indicate that as the number of adults increases, average household expenditures do not increase proportionally (blue line). In other words, average household expenses are proportionally lower as the number of adults increases with respect to a scenario in which each adult would cost the average equivalent of one adult in one-child households (pink line).

Second, marriage encourages saving and investment since each partner provides the other partner with a form of insurance against contingencies such as losing a job, unexpected changes in wages, falling sick, changes in demand for various occupations, etc. (Waite, 1995 and Oppenheimer, 2000). Third, marriage encourages the division of labor (Becker, 1981), and when each household member specializes in the activity in which they have a comparative advantage, there might be gains from trade and specialization. In addition, one might expect economies of scale in household production (besides economies of scale in consumption) that make marriage more effective than single-parenthood. Fourth, there is some evidence that marriage affects the way people behave. For example, married men work more hours than unmarried men, have healthier habits, exhibit more responsibility, etc. (see Lerman, 2002b). Due to lack of longitudinal data in Colombia, it is hard to show whether this is in fact the case. However, international evidence points in that direction.

Finally, it is possible that the kind of people that marry are simply different than the kind of people that do not marry in ways that also affect earnings and other outcomes. For example, it is possible that people that marry are the types that plan more for the future, save and invest more, have certain interpersonal skills also correlated with labor market performance, are less risk averse, etc. In other words, there is the possibility of self-selection into marriage which might make it very difficult to evaluate the causal effect of marriage on outcomes.

Given this, one might think that the advantages of marriage associated to economies of scale in household production, with the division of labor and risk sharing among adults should, in principle, also characterize other family forms such as cohabitation. That would imply that the economic benefits of marriage could be modest relative to cohabitation.

However, national and international evidence suggests a robust positive effect of marriage with respect to cohabitation on household and child outcomes such as children schooling and the level and stability of living standards of women and children. A comprehensive review of this literature can be found in Lerman (2002a). Lerman (2002b) finds a positive effect of marriage vs. cohabitation on the level and stability of living standards experienced by mothers and their children measured by the propensity to experience economic hardship (ratio of income to needs) by using a variety of methods including propensity score

matching, fixed effects models, and comparing women who married and women who did not marry after an unexpected childbearing event.

In addition, Lerman (2002a) reports that married couples in the U.S. have incomes nearly four times their basic needs, a ratio that is about 30 percent higher than what cohabiting couples report (and 63% higher than what single parents experience).

Lichter, Graefe and Brown (2001) report that marriage significantly reduces the likelihood of poverty compared to unwed parenting, holding constant for family background characteristics including race, education and marital vs. non-marital childbearing. In addition, the authors report that this effect was stronger among women at a high risk of poverty than among women at a lower risk of poverty.

Hao (1996) used the National Survey of Families and Households in 1987 and 1988 to examine the net worth of families as a function of marital status and other observed characteristics. The author reports a positive and significant effect of marriage relative to cohabitation. The study also presents evidence that a longer duration in an intact family significantly increases family wealth with respect to longer durations in cohabitation and/or single parenthood. Finally, the author documents that married couple families generally received more in the form of private transfers from both, friends and family, relative to other groups (including cohabiting couples), and indicates this as a potential reason for higher well-being.

Manning and Lichter (1996) estimated the effect of family type on the income-to-needs ratios (income divided by the household's poverty threshold) of children controlling for other observed characteristics such as race, parental education and age, and households size. The conditional effects indicate that cohabiting couples have income-to-needs ratios that are 0.43 points lower than those of married couples.

The literature is scarce in the Colombian case. Ribero (2000) reports that children's school achievement is higher in married households than in cohabiting households even after controlling for observed characteristics and dealing with the potential endogeneity of marital status choices by estimating these decisions jointly with the outcome equation. However, the author does not explore the reasons why this might be the case.

As we have discussed, marriage-induced economies of scale and risk sharing strategies could apply, in principle, to cohabiting couples as well. So it is less clear why outcomes in the latter appear to be consistently worse than outcomes in the former even after controlling for observed characteristics of the household. There are several reasons why this might be the case. First, given that marriage is a more stable living arrangement than cohabitation then planning over the long-term can be more difficult in cohabiting arrangements. Cohabitation might usually entail a sense of transition towards a next stage, indicative in some cases of an exploratory period in response to uncertainties about the desirability of a

particular match. Reduced stability and increased uncertainty can induce couples to invest less in the long term, in each other and in household production (including children).

Second, less stability and more uncertainty about the quality of the match might induce less specialization and lower risk sharing with respect to marriage. For example, it might be more likely that married couples adjust to income shocks to one partner with adjustments by the other partner (e.g. in labor supply) relative to cohabiting couples. This would, in turn, imply that cohabiting couples benefit less from economies of scale and risk sharing.

Third, if not only the couple itself perceives the relationship within cohabitation as less stable but also the market, then formal and informal forms of insurance (including transfers from family and friends) and credit might be less accessible for cohabiting couples than for formally married couples. In fact, Hao (1996) documents that married couple families generally received more in the form of private transfers from both, friends and family.

Fourth, a more stable environment within marriage might also induce more stable behaviors in other dimensions. For example, stable routines and what can be perceived as a more persistent emotional support in the household might translate into more committed behaviors at work. Waite and Gallagher (2000) report that there is an apparent marriage advantage in emotional health for men and women, which might carry over into jobs and earnings capacity.

Finally, it is simply possible that people who choose to marry might be systematically different from those who decide to live together in unobserved ways that are also correlated with outcomes such as earnings. For example, the former might be more stable, less risk averse, more likely to plan for the long-term, etc.

Some prior studies have sought to provide evidence for one or more of these hypotheses regarding the advantages of marriage over cohabitation. Bauman (1999) examined how the experience of material hardship would respond to income received by cohabiting partners vs. income received by married heads of household. The results indicate that, in fact, income linked to cohabitators did significantly less than income linked to married spouses to reduce hardship after controlling for a wide array of observed characteristics. These results might also hint to the fact that there might be much less income sharing within cohabiting couples than among married couples.

Results reported by Winkler (1997) indicate that female cohabiting partners reduce more their hours of work in response to their own non-wage income than in response to the earnings of a cohabiting partner, while hours of work of married females respond to their own non-wage income as much as they do to their husbands' non-wage income. This too, suggests that income sharing is more prevalent among married couples than among cohabiting couples.



Note that most of these studies report conditional differences which might provide evidence for a marriage effect, but not indicate the true marriage effect as all of these are subject to possible selectivity bias. In this paper, we report conditional differences as well but include several exercises in which we attempt to correct for selection.

### **3. Preliminary Evidence of the Effects of Marriage**

In this section we present evidence that married couples seem to have better outcomes (adult and children outcomes in various dimensions) than cohabiting couples, even after controlling for observed differences between the two groups such as income, education, age, household size, etc.

In Table 2 we show differences in durable goods ownership by marital status. The results indicate that married households are more likely to own durable goods in every single case, including telephone, internet, car and home. In all cases, the differences are statistically significant and the differences are quantitatively important. For example, 21.7% of married households have internet while only 6% of cohabiting households do. Similarly, 61% of married couples own a home while only about 30% of cohabiting couples do.

In Table 3 we show mean hourly wages of working men and women by marital status. Male wages for married men are more than twice the ones of cohabiting men on average. Large differences between them remain once we condition on educational attainment, although these are statistically significant only for college graduates, high school graduates with no tertiary education and high school drop outs. Differences between cohabiting and married women are important too. Nevertheless, they are significant only for some educational groups, such as college graduates and high school drop outs.

In Table 4 we show how average non-labor income of married men is significantly higher than that of cohabiting men and this difference remains statistically significant across the income distribution. Note that these differences are quantitatively important with non-labor income of cohabiting males being around a third of non-labor income of married men.

In Table 5 we turn to child outcomes and show two different measures of children's schooling in households with children under age 18 by marital status of the head of the household. In addition, we also condition on income quintile. The results presented indicate that average years of schooling of children under 18 are lower in cohabiting households than in married households especially at the lower end of the income distribution. For example, children under 18 residing in households in the lowest income quintile where the head of the household is married have on average 4.9 years of schooling while children residing in households in the same income quintile where the head of the household is cohabitating with his/her partner have on average 3.7 years of schooling. Similar differences show when one measures schooling by the propensity to be lagged at school conditional on age (see bottom panel in Table 5). Children of cohabiting couples in the

lowest income quintile have a 45% likelihood of being lagged at school conditional on their age; on the other hand, children of married couples in the same income bracket have a 19% chance of being lagged at school.

Table 6 shows health and nutrition measures of children by marital status of the head of the household. The incidence of acute respiratory infection (ARI), acute diarrheic disease (ADD) and fever is higher among children residing in cohabiting households than among children in married households. However, the difference is only statistically different in the case of ADD. In this case, the incidence rate is 14.1% among cohabiting households and 11.2% among married households. The lower panel in Table 6 shows differences in anthropometric measures by marital status of the head of the household. Both, acute and chronic malnutrition are less prevalent among children residing in married households compared to cohabiting households. Only the latter is statistically significant. While 13.4% of children in cohabiting households experience chronic malnutrition, this rate is about 10.6% among children in married households.

In Table 7 we show differences in a set of cognitive and non-cognitive child outcomes by marital status of the head of household. In panel a, we look at the Peabody Picture Vocabulary Test scores and the Woodcock-Muñoz scales at ages 3 through 6. The Peabody is a vocabulary test for standard Spanish and provides a quick estimate of verbal ability and scholastic aptitude. The Woodcock-Muñoz is the Spanish version for the Woodcock-Johnson battery of cognitive tests. This is a standardized battery used for evaluation of the child's intellectual ability and learning capacity. We focus on five of its subscales: intellectual ability, verbal skills, mathematical reasoning, academic knowledge and verbal comprehension.

The results indicate that average cognitive scores are consistently higher for children in married households than for children in cohabiting households. All of the differences are statistically significant and quantitatively important (around a third of a standard deviation in almost all cases), except for the Brief Intellectual Ability Test of the W-M battery. In panel b we show a couple of cognitive and socio-emotional development indices, which correspond to the mother's perception about her child's progress. The socio-emotional index is a scale from 1 to 3 where 3 is the highest perception of the mother about her child's socio-emotional behavior and the cognitive index is a scale from 0 to 1 with 1 being the highest perception. Both are significantly better for children residing in married households than children who live in cohabiting ones. Besides these differences, the proportion of mothers rating their children's development as "very good" along several dimensions of development is also smaller when the head of household is in cohabitation rather than married (see panel c in Table 7).

In sum, we have reported several dimensions along which married households seem to be better off than cohabiting households. These correspond to outcomes at the household level such as durable good ownership and also, adult and child outcomes, such as non-labor

income, average hourly wage rates and schooling and health child outcomes. Some of these differences persist even after conditioning by household income and/or educational attainment of the head of the household.

#### **4. Conditional Effects of Marriage and the Possibility of Endogeneity**

As we have mentioned, individuals who marry might be systematically different from individuals who choose to cohabitate in observed characteristics such as education and income. In addition, it is also possible that these two groups are different in ways that we cannot measure or observe such as attitudes, abilities or circumstances. In other words, the impact of marriage on outcomes might be biased due to the selection issue. For this reason, in this section we explore conditional differences in outcomes and also attempt to estimate a causal effect by using instrumental variables and estimating a selection-correction model in which the marital status decision is estimated jointly with the outcome equation (e.g. adult and child outcomes).

We use as instrumental variables a set of local labor and marriage market variables, including the sex ratio, mean wages for men and women, unemployment rate, female participation rate, and city size in the place of residence of the head of the household. These variables are viewed as a proxy for the value of marriage (or the value of the outside option of marriage). For example, a tight local labor market might imply that it is difficult for women to find a job, thus increasing the value of marriage with respect to singlehood or cohabitation. A favorable sex ratio might also be correlated with the likelihood of marital status. On the other hand, however, it is plausible to argue that these local conditions are not correlated with unobserved individual characteristics such as attitudes, abilities or circumstances that could determine outcome variables as children's schooling, nutrition and health.

In Tables 8a and 8b we report the predictive power of these instruments and some first stage results. The data reported in this paper come from various sources including the Continuous National Household Survey, the *Hogares Comunitarios de Bienestar Familiar* Survey and the Living Standards Survey. Thus, first stage regressions and statistics for the predictive power of the instruments vary across these<sup>2</sup>. We report only some of them although the remaining ones are available upon request. In Table 8a we show measures of the correlation between the endogenous variable (i.e., marriage vs. cohabitation dummy variable) and the instruments. In particular, we show the Shea partial  $R^2$ , the incremental  $R^2$  (i.e., the difference between the unrestricted first-stage  $R^2$  and the restricted  $R^2$ ) and the F-statistic along with its corresponding p-value. The Shea partial  $R^2$ 's range from 0.01 to 0.04, incremental  $R^2$ 's are high, around 0.02 depending on the sample, and F-statistics

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<sup>2</sup> They also vary within survey because the simple changes depending on the outcome variable. For example, child outcomes have a different sample than adult outcomes.

exceed 10 by far in all cases. This implies that the instruments are quite powerful predictors of marital status in various samples.

The first-stage results reported in Table 8b show that local labor markets that are more favorable for women tend to increase the probability of cohabitation vs. marriage. For example, if female labor participation and the fraction of the work force in the services sector (typically female-oriented) are high then the value of marriage decreases in favor of other forms of household formation such as cohabitation.

In each table reported in this section we present conditional differences in a given outcome between married and cohabiting households in the first column, followed by the IV estimates using the instrumental variables described above in the second column, and finally, a selection model in which the marital status variable (married vs. cohabitation) is estimated jointly with the outcome equation using the same instruments as exclusion restrictions to identify the key effects in the third column.

In Table 9 we present results for household ownership of durable goods and services. The number reported in each case is the marginal effect of cohabiting with respect to marriage. The first column indicates differences after conditioning for observed characteristics of the households such as household income and size, educational attainment, age and gender of the head of the household, employment status of the head of the household and city fixed effects. The results confirm the effects reported in the previous section. In particular, the probability of durable goods ownership is lower for cohabiting households with respect to married households in every case. The effects are as low as 1.5 percentage points in the case of TV ownership and as high as 15 percentage points for home ownership.

After controlling for possible endogeneity to unobserved characteristics of households by using instrumental variables to predict marital status or jointly estimating the decision equation with the outcome equation, the effects are accentuated. In particular, the negative effect of cohabitation on durable goods ownership increases once one controls for the possibility that cohabiting households are different from married households in ways we cannot measure or observe. For example, the negative effect of cohabitation on TV ownership increases from 1.5 percentage points to 4.5 percentage points by using IV and 6.8 percentage points in the selection model. We observe the same pattern in most cases, including refrigerator, sound system, internet connection and home ownership. These results indicate that the effect of marriage estimated by OLS is downwardly biased, which would, in turn, imply that people who choose to live together before marriage are characterized by unobserved/unmeasured attitudes or circumstances that are associated with higher well-being (such as more caution, less risk-taking, less impulsiveness, more career-oriented than family-oriented, etc.).

In Table 10 we show results for differences in hourly wages by gender. The difference in log hourly wages by marital status is about 0.15, or 15% of hourly wages once one

conditions on observable characteristics such as household income and size, educational attainment, age and gender of the head of the household, employment status of the head of the household and city fixed effects. In other words, married men earn about 15% more than men who are cohabitating with their partners and married women earn around 11% more than cohabiting women.

Yet again, these differences are accentuated once one controls by unobserved characteristics either by using instrumental variables or estimating the selection model. In particular, hourly wages of married men are now about 40% higher than cohabiting men, and the difference between married women's wages and cohabiting women's wages is at least 16%. The marital status effect estimated by the selection model is quantitatively big. It turns out that there are important regional differences in this estimate. In particular, the effect is much smaller in Bogotá than in other areas of the country. For example, the effect of cohabitation on male hourly wages is about -23% in Bogotá and close to -56% elsewhere. The effect of cohabitation vs. marriage on female hourly wages is about -9% in Bogotá and -44% elsewhere. The effects of schooling and work experience show the expected signs and magnitudes.

This result is interesting in the sense that if cohabitation has an adverse effect on wages after controlling for observed and unobserved characteristics, then there is reason to believe that the recent trends in marriage in the country might feedback into a worsening of the income distribution. If wages of individuals who cohabit are lower than wages of individuals who marry, then the fact that individuals at the lower end of the distribution tend to cohabit more than individuals at the upper end has important effects on how wealth is distributed, and there might be scope for policy that encourages marriage such as tax credits.

In Table 11 we explore further the difference in child outcomes by parents' marital status. We had reported that some differences emerge in the raw data in terms of schooling, cognitive and non-cognitive development, health and nutrition. In Table 11 we present estimates for this difference after controlling for observed and unobserved characteristics of households. The number reported in each case is the effect of cohabiting with respect to marriage. Children's average schooling is consistently lower in cohabiting households than in married households. The conditional difference in years of schooling is around 0.22, that is, after controlling for variables like age and schooling of the head of household, household income and size, labor status of the head of the households and city fixed effects. This difference is bigger once one controls for unobserved characteristics. In particular, it increases to 0.4 years either by IV or estimation of the selection model. Something similar happens with the likelihood of being lagged at school. This probability is higher among children in cohabiting households than children in married households by about 0.14 (14 percentage points) or 27 percentage points once one instruments marital status using local labor market and local marriage market conditions.

Table 11 also includes measures of cognitive and non-cognitive development. In particular, we include the Early Development Index (Janus & Offord, 2000) which as a mother-reported scale that measures weaknesses and strengths in child's development. The non-cognitive index is a scale from 1 to 3 where 1 is the best perception of the mother of her child's socio-emotional development as it indicates lower presence of behavioral problems. The cognitive index corresponds to a scale from 0 to 1 where 1 indicates the highest (best) perception of the mother about her child's cognitive development.

The conditional difference in socio-emotional development is positive, which means that the scale is higher (worse) for children in cohabiting households than in married households. In particular, the index is 0.04 points higher in the former indicating worse non-cognitive development. This difference is statistically significant even after conditioning for observed characteristics of the household such as age and schooling of the head of household, household income and size, labor status of the head of the households and city fixed effects. The difference against children in cohabiting households remains significant after correcting for selection bias but the magnitude is significantly bigger. For example, after using instrumental variables this effect is 0.25 points of the EDI non-cognitive scale (approximately one standard deviation). In terms of children's aggressiveness and isolation as measured by the PIPPS index, the results indicate that the difference disappears once one conditions on observed characteristics of the household in the case of aggressiveness but the effect is significant (against children in cohabiting households) and quantitatively important in the case of isolation, once one instruments marital status.<sup>3</sup>

In terms of cognitive development, something similar happens. In particular, the conditional difference indicates that children in cohabiting households exhibit lower cognitive development than children in married households even after controlling for observed characteristics of the household. This difference is around 0.02 points in a 0-to-1 scale. Yet again, this difference is accentuated once endogeneity is controlled for by instrumental variables or estimating the selection model. The effect increases to about 0.25 points in the scale, which is about one standard deviation. When the Peabody Vocabulary Picture Test is used as a measure of scholastic aptitude, we observe that the difference against children in cohabiting households is fully accounted for by observed characteristics of the household such as age and educational attainment of the head of the household.

Finally we show some of the nutrition and health indicators reported earlier in Table 6, including chronic malnutrition and incidence of ADD and ARI. The results in this case indicate that the difference against children in cohabiting households does not hold up after controlling for observed characteristics of the household. That means that differences in health and nutrition between children in cohabiting and children in married households can

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<sup>3</sup> A higher value of the isolation index indicates more behavioral problems of this type. Thus a positive sign indicates an effect against children that live in cohabiting households vs. children in married households.

be accounted for by differences in household income, education and age of the head of the household and other characteristics including labor status.

In sum, we have documented that there are important differences in household, adult and child outcomes between cohabiting households and married households. Most of these differences persist even after controlling for observed characteristics of the household such as age and schooling of the head of household, household income and size, labor status of the head of the households and city fixed effects, and unobserved characteristics of the household by using instrumental variables. In particular, we have shown that there are important differences in durable goods ownership, male and female hourly wages, non-labor income, children's schooling, cognitive development and socio-emotional development. Some other differences, such as children's health and nutrition, can be accounted for by differences in household income, education of the head of the household and other differences in observed characteristics between cohabiting households and married households.

These results are interesting in the sense that if cohabitation has an adverse effect on households and children in particular, then there is reason to believe that the recent trends in marriage in the country might feedback into a worsening of the income distribution. If outcomes of individuals who cohabit (and children in these households) are worse than outcomes of individuals who marry, then the fact that individuals at the lower end of the distribution tend to cohabit more than individuals at the upper end has important effects on how wealth is distributed, and there might be scope for policy that encourages marriage.

## **5. Heterogeneous Effects of Cohabitation vs. Marriage**

In this section we explore whether the effect of cohabitation vs. marriage on adult and child outcomes reported in the previous section varies depending on observed characteristics of individuals. In particular, we assess whether these effects change by household income. In Table 12 we report OLS estimates of the interacted model in which we allow the effect of cohabitation to vary this characteristic.

The results indicate that for some of the outcomes evaluated, the negative effect of cohabitation with respect to marriage tends to be even stronger among households in the poorest income quintile. For example, effects on children's years of schooling and hourly wages are significantly higher among the poorest. Effects on durable goods ownership are lower but not statistically significant. This means that the effect of cohabitation might have a multiplier effect on the distribution of income since marital status trends indicate that cohabitation has become more prevalent among the poorest and, in addition, there the marriage effect is stronger among the same group of households.

## 6. Exploring the Reasons for the Existence of a Marriage Premium

In Section 5 we documented that there are important differences in household, adult and child outcomes between cohabiting households and married households. Most of these differences persist even after controlling for observed characteristics of the household such as age and schooling of the head of household, household income and size, labor status of the head of the households and city fixed effects, and unobserved characteristics of the household by using instrumental variables. In this section, we explore further some of the reasons why these persistent differences might arise.

First, it is simply possible that people who choose to marry might be systematically different from those who decide to live together in unobserved ways that are also correlated with outcomes such as earnings. We have explored this hypothesis by evaluating the effect of cohabitation after controlling for unmeasured and/or unobserved characteristics by using instrumental variables. These results suggest that, in fact, there is a systematic unobserved difference between the two types of households. The results indicate that the effect of marriage estimated by OLS is downwardly biased, which implies that people who choose to live together before marriage are characterized by unobserved/unmeasured attitudes or circumstances that are associated with higher well-being (such as more caution, less risk-taking, less impulsiveness, more career-oriented than family-oriented, etc.).

Second, we argue that given that marriage is a more stable living arrangement than cohabitation then planning over the long-term can be more difficult in latter than in the former. Cohabitation usually entails a sense of transition towards a next stage, indicative in some cases of an exploratory period in response to uncertainties about the desirability of a particular match. Reduced stability and increased uncertainty can induce couples to invest less in the long term, in each other and in household production (including children).

A symptom of this could be that there is actually less specialization and income pooling in cohabiting households than in married households even though they both have an advantage over single-parent households due to the presence of two potential wage-earners. Since a cohabiting relationship might be perceived as less stable because there is still some uncertainty about the quality of the match, then less specialization and lower risk sharing occurs with respect to marriage.

Third, if not only the couple itself perceives the relationship within cohabitation as less stable but also the market, then there might be an intended differential treatment for the two types of households which might impose additional constraints on cohabiting households. For example, it can be more difficult to have access to formal and informal forms of insurance (including transfers from family and friends) and credit might be less accessible for cohabiting couples than for formally married couples. In fact, Hao (1996) documents that married couple families generally received more in the form of private transfers from both, friends and family.



Finally, a more stable environment within marriage might also induce more stable behaviors in other dimensions. For example, stable routines and what can be perceived as a more persistent emotional support in the household might translate into more committed behaviors at work. Waite and Gallagher (2000) report that there is an apparent marriage advantage in emotional health for men and women, which might carry over into jobs and earnings capacity.

In sum, the underlying hypothesis is that cohabiting relationships are (or are perceived) as less stable than marriage and this has consequences on the way in which others act upon cohabiting couples and on the way in which members of cohabiting couples act in terms of household investments and planning for the future. As a result, individuals invest less in the future, specialization and income pooling are less prevalent (as a form of insurance for likely separation) thus reducing the advantages of economies of scale, and others are less likely to transfer income, provide credit or insurance, etc. to cohabiting households than to married households. In this section we try to assess whether some of these arguments can be validated in the data.

First, in Table 13 we present the effects of marriage for different durations of the cohabiting relationship. The negative effect of cohabitation is consistently higher, the lower the duration of the relationship. In particular, we show the effects on durable goods ownership, labor earnings and children's schooling attainment (conditional on child's age). For example, the likelihood of owning a durable good (except for a home) is always significantly lower for cohabiting couples with respect to married couples in cases in which the former relationship is shorter than 2 years than in cases in which it has lasted longer than that. The fact that shorter relationships exhibit stronger effects might reveal to some extent that, in fact, a plausible mechanism for this effect is that one type of relationship is perceived as less stable than the other, thus inducing certain behaviors within and outside the couple which imply less investments, less long-term planning and less benefits associated with economies of scale.

In addition, the fact that negative effects are prevalent even among cohabiting couples that have been together for a long time, rules out the existence of a binding contract and the fact that cohabiting relationships might be shorter as possible explanations for the marriage effect reported.

In regards to our second hypothesis, according to which, specialization and risk-sharing are lower among cohabiting households due to a more uncertain investing environment, we provide some evidence in Tables 14 and 15. First, in Table 14 we present several exercises in which we assess whether or not there is less specialization among cohabiting couples. Theory and empirical evidence suggest that among two-parent households some specialization occurs in the sense that one member of the couple specializes in the labor market and the other one in household production. Due to obvious competitive advantages, it is usually observed that men work more than women and women participate more

actively in household production than men. The results presented in Table 14 suggest that this is less obvious among cohabiting couples than married couples.

In panel A, we show a regression of weekly hours worked on marital status and an array of observed characteristics including household income and educational attainment of the head of the household. The results confirm that, in fact, cohabiting men work fewer hours than married men while cohabiting women work more than married women. In other words, less specialization takes place among cohabiting couples. Furthermore, in panel B we show a regression of the woman's share of hours worked by the couple on marital status and other controls. According to the results, even after conditioning for each member's labor income, females' share of total hours is higher among cohabiting households than married households. Yet again, this evidence points in the direction of more specialization among married households than cohabiting households.

In Table 15 we present a regression of women's hours of work on the household wage gap, i.e., her husband's hourly wage divided by her own hourly wage, and an array of other observable characteristics. If the hypothesis about less risk-sharing and lower income pooling holds true then cohabiting women's hours of work would respond less to the wage gap than married women. The results indicate that the higher the wage gap, the higher is the wife's labor supply. However, once one introduces an interaction with the marital status dummy, there does not seem to be a difference between the response of cohabiting women and the response of married women. Thus, the exercise does not lend support to the hypothesis that there is less income pooling in one type of households than in the other. One could also possibly regress female hours of work on male and female non-wage income; if the cohabiting partner fully shares his income, then increases in his non-wage income would reduce his partner's hours by as much as increases in her own non-wage income. However, there is a serious problem of missing data on non-labor income in the household survey so the results in this regression render meaningless.

In sum, there is partial evidence in favor of the hypothesis according to which cohabiting couples take less advantage of economies of scale present in two-parent households. In particular, we have shown evidence that there is less specialization in the sense that it is not clear that cohabiting women are relative more devoted to household production than cohabiting men, and these to market work with respect to comparable married couples. However, we find no evidence that there is less risk-sharing among cohabiting couples.

The lack of appropriate data precludes us from testing our third hypothesis according to which the perception of third parties about the cohabiting couple might be different than the perception about married couples in the sense of lower long-run stability. Thus, for instance, it is possible that cohabiting couples have less access to formal credit and insurance markets.

Finally, we speculate that a more stable environment within marriage might also induce more stable and healthy behaviors in other dimensions. For example, stable routines and what can be perceived as a more persistent emotional support in the household might translate into healthier behaviors at work, within the couple and with other people. In Table 16 we report differences in reported health status and preventive care regarding one's health. The results indicate that, in fact, married individuals seem to practice healthy habits more often than their cohabiting counterparts. In particular, the probability of a preventive medical visit (both medical and dental) significantly decreases for cohabiting adults. Cohabiting adults also perceive their own health to be worse than married individuals but this difference does not turn out to be statistically significant.

In Table 17 we show women's healthy behavior regarding reproductive behavior in particular. The results show evidence of healthier behaviors among married women with respect to cohabiting women. In particular, the risk of unplanned pregnancy is significantly higher among cohabiting couples (around 9 percentage points higher). The probability of unhealthy behaviors during pregnancy such as alcohol intake and smoking are higher among cohabiting women although only the former is statistically significant around five percentage points. Finally, the number of prenatal controls is lower among cohabiting women although not statistically significant.

Finally, in Table 18 we show additional evidence of healthier, more stable, behaviors among married couples with respect to cohabiting couples. We report the conditional difference between the two types of households in the risk of female domestic violence. The results indicate that conditional on a wide set of observable characteristics of households, domestic violence is significantly more prevalent among cohabiting households than married households by around 6 percentage points.

In sum, these exercises suggest that married households are, in fact, characterized by healthier (more stable) behaviors that might translate into healthier behaviors at work, within the couple and with other people.

## **7. Conclusions**

In this paper, we assess whether there exist significant differences in adult and child outcomes between married and cohabiting households in Colombia. There is some evidence that in spite of the fact that both types of households are composed by two potential wage earners there are important differences in economic well-being and children's outcomes in favor of married families. We then attempt to understand the reasons why this is the case. This is relevant in the sense that if cohabiting households are worse-off than married households, then the recent trends in marital status by income are a reason for concern as this might feedback into a worsening of the income distribution. In particular, households in the middle portion of the distribution (third and fourth quintile) have significantly changed in terms of marital status between 1982 and 2006. These households look less like

the top quintile and more like the bottom quintile, in terms of significantly lower fractions of married households, and significantly higher proportions of cohabiting and divorced households.

Some descriptive evidence suggests important differences between married households and cohabiting households in detriment of the latter along various dimensions of well-being. These correspond to outcomes at the household level such as durable good ownership and also, adult and child outcomes, such as non-labor income, average hourly wage rates and schooling and health child outcomes. Some of these differences persist even after conditioning by household income and/or educational attainment of the head of the household.

However, these descriptive statistics might be biased in the sense that individuals who marry might be systematically different from individuals who choose to cohabit in observed characteristics such as education and income. In addition, it is also possible that these two groups are different in ways that we cannot measure or observe such as attitudes, abilities or circumstances. In other words, the impact of marriage on outcomes might be biased due to the selection issue. For this reason, we also explore conditional differences in outcomes and also estimate a causal effect by using instrumental variables and estimating a selection-correction model in which the marital status decision is estimated jointly with the outcome equation (e.g. adult and child outcomes).

We use as instrumental variables a set of local labor and marriage market variables, including the sex ratio, mean wages for men and women, unemployment rate, female participation rate, and city size in the place of residence of the head of the household. These variables are viewed as a proxy for the value of marriage (or the value of the outside option of marriage). For example, a tight local labor market might imply that it is difficult for women to find a job, thus increasing the value of marriage with respect to single-hood or cohabitation. A favorable sex ratio might also be correlated with the likelihood of marital status. On the other hand, however, it is plausible to argue that these local conditions are not correlated with unobserved individual characteristics such as attitudes, abilities or circumstances that could determine outcome variables as children's schooling, nutrition and health.

The results indicate that most of the unconditional differences between married households and cohabiting households persist even after controlling for observed characteristics of the household such as age and schooling of the head of household, household income and size, labor status of the head of the households and city fixed effects, and unobserved characteristics of the household, by using instrumental variables. In particular, we have shown that there are important differences in durable goods ownership, male and female hourly wages, non-labor income, children's schooling, cognitive development and socio-emotional development. Some other differences, such as children's health and nutrition, can be accounted for by differences in household income, education of the head of the

household and other differences in observed characteristics between cohabiting households and married households.

These results are interesting in the sense that if cohabitation has an adverse effect on households and children in particular, then there is reason to believe that the recent trends in marriage in the country might feedback into a worsening of the income distribution. If outcomes of individuals who cohabit (and children in these households) are worse than outcomes of individuals who marry, then the fact that individuals at the lower end of the distribution tend to cohabit more than individuals at the upper end has important effects on how wealth is distributed, and there might be scope for policy that encourages marriage.

Finally, we explore some of the reasons why this marriage premium might arise. The findings indicate that there is evidence that there is less specialization among cohabiting couples than among married couples and, thus, the former take less advantage of economies of scale prevalent among two-parent households (relative to one-parent households). We did not find consistent evidence that there is less risk sharing (or less income pooling) among cohabiting households. In addition, we show that married households are characterized by healthier behaviors such as preventive medical care, better prenatal care and less incidence of domestic violence. This might suggest that a more stable environment within marriage might also induce more stable and healthy behaviors in other dimensions.

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**Table 1**

<b>a. Total household members. By income quintile.</b>					
Marital status (head of household)	Quintile				
	1	2	3	4	5
Cohabiting	4,780	<b>4,255</b>	<b>3,884</b>	<b>3,536</b>	<b>3,076</b>
Separated/ divorced	4,044	3,519	3,019	2,406	1,990
Widowed	4,279	4,037	3,559	3,048	2,474
Single	3,270	2,883	2,797	1,951	1,607
Married	4,739	<b>4,530</b>	<b>4,276</b>	<b>3,892</b>	<b>3,501</b>
Total	4,439	4,088	3,775	3,212	2,775

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

<b>b. Household members under 18. By income quintile.</b>					
Marital status (head of household)	Quintile				
	1	2	3	4	5
Cohabiting	<b>2,343</b>	<b>1,838</b>	<b>1,409</b>	1,089	0,806
Separated/ divorced	2,068	1,477	0,939	0,514	0,330
Widowed	1,507	1,263	0,847	0,516	0,267
Single	1,308	0,950	0,620	0,258	0,091
Married	<b>1,873</b>	<b>1,596</b>	<b>1,303</b>	1,007	0,799
Total	1,980	1,573	1,174	0,788	0,552

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

<b>c. Per capita Household income. By income quintile.</b>					
Marital status (head of household)	Quintile				
	1	2	3	4	5
Cohabiting	88137	190088	318064	<b>516843</b>	1636836
Separated/ divorced	77744	192648	316839	532588	1881392
Widowed	77435	197327	317156	534866	1706638
Single	78385	196844	320147	529163	2027883
Married	86057	193568	318889	<b>536857</b>	1977670
Total	83427	192960	318317	530526	1906843

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level



Table 2

Durable goods & services by marital status									
Marital status	Good or service								
	Telephone	Internet	Refrigerator	Water heater	Sound system	PC	Car	TV	Home
Cohabiting	<b>60,35%</b>	<b>6,09%</b>	<b>76,55%</b>	<b>15,97%</b>	<b>52,25%</b>	<b>15,11%</b>	<b>10,25%</b>	<b>94,49%</b>	<b>29,91%</b>
Separated/ divorced	69,75%	11,54%	76,18%	24,09%	51,03%	22,57%	9,39%	92,69%	43,58%
Widowed	82,29%	11,05%	87,03%	33,03%	50,75%	21,48%	12,64%	94,28%	71,80%
Single	70,73%	14,41%	71,66%	31,24%	46,49%	25,61%	11,55%	89,50%	36,03%
Married	<b>85,14%</b>	<b>21,72%</b>	<b>92,94%</b>	<b>36,07%</b>	<b>68,66%</b>	<b>40,04%</b>	<b>26,80%</b>	<b>98,22%</b>	<b>61,12%</b>
Total	74,22%	14,09%	82,72%	28,08%	56,98%	27,16%	16,36%	94,86%	48,24%

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

**Table 3**

<b>Mean hourly wage by educational level. Working men.</b>								
	Educational level							Total
	None	Primary (incomplete)	Primary (complete)	Some highschool	Highschool graduate	Some college	College/University graduate	
Cohabiting	<b>1490,4</b>	2713,2	2874,3	<b>2481,1</b>	<b>2963,6</b>	4656,6	<b>8094,8</b>	<b>3257,8</b>
Sep/ divorced	1632,3	1449,8	1859,1	2139,5	3024,6	5595,9	10478,3	3822,6
Widowed	2649,5	1537,5	1566,2	2368,8	3692,1	8070,6	4577,4	2826,2
Single	1205,0	1426,6	1853,2	2355,2	2529,0	4075,5	7912,6	3489,2
Married	<b>1161,9</b>	2550,1	2655,6	<b>3013,0</b>	<b>4237,3</b>	5476,9	<b>14099,6</b>	<b>6019,1</b>
Total	1381,8	2320,1	2512,5	2558,7	3186,2	4728,4	11099,3	4255,6

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

<b>Mean hourly wage by educational level. Working women.</b>								
	Educational level							Total
	None	Primary (incomplete)	Primary (complete)	Some highschool	Highschool graduate	Some college	College/University graduate	
Cohabiting	1073,9	1360,7	1799,4	<b>1764,8</b>	2831,7	10837,5	<b>6545,6</b>	3437,5
Sep/ divorced	1762,6	1637,7	1786,8	1972,4	2546,6	4386,8	9624,7	3368,4
Widowed	1286,2	1460,2	2411,1	2498,5	4049,0	6638,7	9924,6	3139,9
Single	1554,9	1979,0	1913,9	1791,2	2270,3	3908,6	6845,2	3358,0
Married	1188,5	1376,7	1857,1	<b>2159,7</b>	3260,2	4485,5	<b>9447,8</b>	4505,6
Total	1402,5	1578,3	1882,6	1931,3	2705,7	5278,7	8226,1	3643,6

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

<b>Per capita Household income. By educational level (head of household)</b>								
Marital status (head of household)	Educational level							Total
	None	Primary (incomplete)	Primary (complete)	Some highschool	Highschool graduate	Some college	College/University graduate	
Cohabiting	<b>175061</b>	<b>219122</b>	<b>250511</b>	<b>269840</b>	<b>365063</b>	<b>544220</b>	<b>894676</b>	<b>387349</b>
Sep./ divorced	214829	222091	274327	301342	354010	647942	1275485	585438
Widowed	208569	294432	391022	435006	740432	969959	1117646	542121
Single	231845	254917	278693	322924	471798	783737	1375723	792358
Married	<b>257282</b>	<b>306493</b>	<b>361073</b>	<b>383688</b>	<b>564385</b>	<b>625511</b>	<b>1606604</b>	<b>725294</b>
Total	219382	265560	315725	334021	474996	639395	1443082	606783

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

**Table 4**

<b>Average non-labor income (\$)</b>						
Men 18 and older						
Marital status	Income Quintile					Total
	1	2	3	4	5	
Cohabiting	<b>10054</b>	<b>23221</b>	<b>33927</b>	<b>67745</b>	<b>242430</b>	<b>49534</b>
Separated/ divorced	17879	19388	51285	70906	387305	125975
Widowed	60181	136703	254119	459278	1120352	374181
Single	1843	6792	8607	12199	82530	21732
Married	<b>34581</b>	<b>82443</b>	<b>134475</b>	<b>228937</b>	<b>720091</b>	<b>259296</b>
Total	15523	37766	63845	111081	415259	121235

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

**Table 5**

<b>Average schooling (children under 18) by income quintile</b>						
Marital status (head of household)	Income Quintile					Total
	1	2	3	4	5	
Cohabiting	<b>3,757</b>	<b>4,275</b>	<b>4,439</b>	<b>4,951</b>	<b>4,691</b>	<b>4,231</b>
Separated/ divorced	4,440	5,240	5,436	5,777	6,084	5,014
Widowed	4,535	5,170	5,290	5,563	5,585	5,089
Single	4,698	5,747	5,623	5,854	6,403	5,473
Married	<b>4,929</b>	<b>4,997</b>	<b>5,358</b>	<b>5,546</b>	<b>5,433</b>	<b>5,210</b>
Total	4,357	4,833	5,081	5,424	5,423	4,875

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

<b>% of children (16 to 20) lagged at school<sup>a</sup> by income quintile</b>						
Marital status (head of household)	Income Quintile					Total
	1	2	3	4	5	
Cohabiting	<b>45,08%</b>	<b>34,23%</b>	<b>28,92%</b>	<b>17,29%</b>	12,29%	<b>33,26%</b>
Separated/ divorced	32,30%	28,84%	27,65%	14,69%	9,18%	26,57%
Widowed	37,27%	23,00%	16,99%	17,74%	3,77%	25,33%
Single	26,09%	26,27%	20,43%	17,87%	15,70%	22,22%
Married	<b>19,12%</b>	<b>15,01%</b>	<b>12,47%</b>	<b>10,13%</b>	8,22%	<b>13,15%</b>
Total	31,96%	25,41%	19,86%	13,74%	9,13%	22,59%

<sup>a</sup> If schooling attainment is less than median schooling for age/gender group minus 1 (Gaviria & Dahan, 2001).

Source: CHS 2006

Bold= difference is statistically different from 0 at the 5% level

**Table 6**

<b>Children's health</b>			
Marital status (mother)	Children with:		
	ARI	ADD	Fever
Married	<b>36,24%</b>	<b>11,22%</b>	22,42%
Cohabiting	<b>38,91%</b>	<b>14,10%</b>	24,22%
Single	41,43%	16,86%	26,45%
Sep/divorced	44,02%	18,28%	26,66%
Widowed	32,12%	13,05%	27,86%
Total	39,09%	14,22%	24,38%

Source: Colombian DHS (2005)

ARI: Acute respiratory infection; ADD: Acute diarrheic disease

Bold= difference is statistically different from 0 at the 5% level

<b>Children under 5 with malnutrition</b>		
Marital status (mother)	Acute	Chronic
Married	0,86%	<b>10,58%</b>
Cohabiting	1,32%	<b>13,38%</b>
Single	1,68%	11,43%
Sep/divorced	1,14%	12,95%
Widowed	0,00%	13,96%
Total	1,29%	12,35%

Source: Colombian DHS (2005)

Acute malnutrition is measured as z-score of weight by age below -2.

Chronic malnutrition is measured as z-score of weight/height below -2.

Bold= difference is statistically different from 0 at the 5% level

**Table 7**

<b>a. Average scores on Cognitive tests</b>						
Marital Status of the mother	Peabody	Woodcock-Muñoz				
		Intellectual Ability	Verbal skills	Mathematical reasoning	Academic knowledge	Verbal comprehension
Married	<b>93,906</b>	<b>87,876</b>	<b>85,553</b>	<b>85,538</b>	<b>85,650</b>	<b>81,198</b>
Cohabiting	<b>89,280</b>	<b>85,338</b>	<b>78,627</b>	<b>80,468</b>	<b>78,676</b>	<b>77,206</b>
Div/ Separated	90,192	88,142	82,375	82,570	81,780	78,270
Widowed	93,398	87,160	80,424	83,992	80,518	81,252
Single	92,636	88,238	84,650	84,408	84,291	81,461
Total	90,551	86,454	80,911	82,023	80,848	78,468

Source: HCB database

Woodcock-Muñoz is the spanish version for the Woodcock-Johnson battery of cognitive tests

Bold= difference is statistically different from 0 at the 5% level

<b>b. Children's development</b>		
Marital status of the mother	Socio emotional <sup>1</sup>	Cognitive <sup>2</sup>
Married	<b>1,484</b>	<b>0,322</b>
Cohabiting	<b>1,576</b>	<b>0,265</b>
Sep/ divorced	1,571	0,261
Widowed	1,537	0,269
Single	1,531	0,292
Total	1,555	0,277

Source: HCB database

Mother's report of her perception of child's development

<sup>1</sup> Scale from 1 to 3, with 1 being the best.

<sup>2</sup> Scale from 0 to 1, with 1 being the best.

Bold= difference is statistically different from 0 at the 5% level

<b>c. Children's behavior</b>			
Marital status of the mother	Aggressiveness index	Isolation Index	Adequate interaction index
Married	1,8168	<b>1,3521</b>	<b>3,0488</b>
Cohabiting	1,8591	<b>1,3975</b>	<b>2,9291</b>
Sep/ divorced	1,9254	1,3977	2,9149
Widowed	1,9464	1,3694	3,0063
Single	1,8546	1,4149	2,9373
Total	1,8620	1,3912	2,9488

Source: HCB database

Aggressiveness Index (1 to 4, 1 being less aggressive)

Isolation Index (1 to 4, 1 being less isolated)

Adequate interaction Index (1 to 4, 4 being more adequate interaction)

Bold= difference is statistically different from 0 at the 5% level

**Table 8**

<b>Power of instruments</b>						
Sample	Shea Partial R2	Restricted R2	Unrestricted R2 (exogenous vars. + instruments)	Incremental R2	F - Statistic	P-value
Children under 18	0,0158	0,1042	0,1183	0,0141	58,780	0,0000
Households	0,0169	0,1944	0,2081	0,0137	49,160	0,0000
Men in WAP	0,0176	0,167	0,1817	0,0147	37,890	0,0000
Women in WAP	0,0117	0,187	0,1966	0,0096	14,590	0,0000
Children (HCB)	0,0104	0,1201	0,1292	0,0091	1,72	0,1261

Source: Colombian CHS (2006) and HCB database.

Dependant variable is 1 if individual or head of household is cohabiting and 0 if he/she is married.

Exogenous variables are income quintile, schooling level, age, household size, gender of head of household, city fixed effects and labor status fixed effects.

Instruments are local sex ratio, mean wages for men and women, unemployment rate, female participation rate, city size in the city of residence of the head of the household.

<b>First stages</b>					
Instrument	Sample				
	Children under 18	Households	Men in WAP	Women in WAP	Children (HCB)
Female participation rate	1,431*** [0,13]	1,011*** [0,14]	1,107*** [0,16]	0,592*** [0,21]	0,496** [0,195]
% Occupied in service sector	1,128*** [0,085]	0,786*** [0,088]	1,073*** [0,096]	0,745*** [0,14]	2,129* [1,271]
Unemployment rate	-1,501*** [0,14]	-0,535*** [0,15]	-1,023*** [0,16]	-0,611*** [0,22]	
Mean hourly wage for women	0,0633*** [0,0099]	-0,847*** [0,12]	-0,571*** [0,14]	-0,539*** [0,19]	
Mean hourly wage for men	-0,101*** [0,012]	0,0289*** [0,010]	1,041*** [0,40]	0,78 [0,51]	
Sex ratio	-0,695*** [0,11]	-0,0799*** [0,013]	0,0442*** [0,011]	0,0141 [0,015]	
City size	-0,0928 [0,32]	0,5 [0,34]	-0,104*** [0,014]	-0,0620*** [0,019]	
Unemployment rate (rural)					-0,581 [0,363]
Unemployment rate (urban)					-1,578 [0,981]
Average # of children in household					0,030 [-0,105]

Source: Colombian CHS (2006) and HCB database.

Dependant variable is 1 if individual or head of household is cohabiting and 0 if he/she is married.

Exogenous variables are income quintile, schooling level, age, household size, gender of head of household, city fixed effects and labor status fixed effects.

**Table 9**

<b>Goods and services ownership</b>			
Marginal effect of cohabiting with respect to marriage			
Good/Service	Conditional difference 1	IV 2	Joint ML Estimation 3
TV	-0,015 *** (0,003)	-0,045 ** (0,022)	-0,068 (0,049)
Refrigerator	-0,068 *** (0,007)	-0,460 *** (0,038)	-0,302 *** (0,029)
Sound System	-0,092 *** (0,012)	-0,343 *** (0,050)	-0,283 *** (0,048)
Telephone	-0,117 *** (0,009)	-0,698 *** (0,010)	-0,545 *** (0,009)
Water Heating	-0,093 *** (0,012)	-0,378 *** (0,039)	-0,519 *** (0,008)
Internet Connection	-0,055 *** (0,007)	-0,197 *** (0,039)	-0,176 *** (0,032)
PC	-0,140 *** (0,011)	-0,365 *** (0,041)	-0,368 *** (0,039)
Car	-0,052 *** (0,009)	-0,042 (0,047)	-0,039 (0,055)
Home	-0,153 *** (0,012)	-0,457 *** (0,043)	-0,452 *** (0,037)

Robust standard errors in parentheses. \*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

Source:Colombian CHS (2006). Sample is head of households who are either married or cohabiting.

Instruments are local labor and marriage market variables (table 8)

1: Probit marginal effects estimates

2: instrument is the probability of cohabiting, predicted through a probit including the instruments from table 8.

3: Exclusion restrictions are the same instruments from column 2.

Other covariates include income quintile, schooling level, age, household size, gender of head of household, and city fixed and labor status fixed effects.

Individual variables are head of household's. Income quintiles are based on monthly household income per capita.



**Table 10**

<b>Log hourly labor income.</b>						
Panel A: Mincer equation						
Variable	Men			Women		
	Conditional difference <sup>1</sup>	IV	Joint ML Estimation <sup>2</sup>	Conditional difference <sup>1</sup>	IV	Joint ML Estimation <sup>2</sup>
Cohabiting	-0,156*** [0,020]	-0,400*** [0,120]	-0,567*** [0,11]	-0,112*** [0,025]	-0,158 [0,230]	-0,448*** [0,067]
Bogotá x cohabiting			0,333*** [0,069]			0,351*** [0,047]
<i>Schooling</i>						
Years	0,0626*** [0,005]	0,0557*** [0,006]	0,0526*** [0,006]	0,071*** [0,007]	0,069*** [0,012]	0,060*** [0,007]
College premium	0,625*** [0,047]	0,605*** [0,049]	0,603*** [0,047]	0,551*** [0,050]	0,550*** [0,051]	0,564*** [0,050]
Highschool premium	0,0827*** [0,030]	0,0674** [0,032]	0,0620** [0,031]	0,0186 [0,045]	0,0175 [0,046]	0,0464 [0,046]
Experience	0,0306*** [0,002]	0,0255*** [0,004]	0,0263*** [0,003]	0,024*** [0,003]	0,024*** [0,006]	0,022*** [0,003]
Experience squared	-0,0004*** [0,000]	-0,0004*** [0,000]	-0,0004*** [0,000]	-0,0004*** [0,000]	-0,0004*** [0,000]	-0,0004*** [0,000]
Constant	6,609*** [0,130]	7,166*** [0,230]	7,055*** [0,180]	6,312*** [0,170]	6,368*** [0,330]	6,597*** [0,180]
Observations	18700	18700	18700	10749	10749	10749
R-squared	0,420	0,410		0,380	0,380	

Robust standard errors in brackets

\* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level

Source:Colombian CHS (2006)

Sample is men in the WAP who declare labor income different from 0, and who are either married or cohabiting.

Dependent variable is log hourly labor income

1 OLS estimates

2 Exclusion restrictions are the same instruments from column 2.

Experience is potential experience ( max[0,age-schooling years -6])

Occupation fixed effects included but not reported.

Instruments are local labor and marriage market variables (sex ratio, mean wages for men and women, unemployment rate, female participation rate, city size in the city of residence of the head of the household)

**Table 11**

<b>Children outcomes</b>			
Marginal effect of cohabiting with respect to marriage			
Outcome	Conditional difference	IV 1	Joint ML Estimation 2
Years of schooling	-0.221*** [0.026]	-0.395*** [0.15]	-0.405*** [0.14]
Lagged at school	0.142*** [0.017]	0.270*** [0.089]	0.410*** [0.084]
Socio-emotional development 3	0.0397*** [0.012]	0.257** [0.11]	0.184*** [0.064]
Cognitive development 4	-0.0190** [0.0090]	-0.271*** [0.081]	-0.259*** [0.033]
Peabody test 5	-0.975 [0.99]	-7.132 [10.5]	-2.788 [5.87]
Aggresivenes index 5	0.0318 [0.028]	0.288 [0.44]	0.153 [0.17]
Isolation index 5	0.0256 [0.017]	0.545* [0.31]	0.167*** [0.056]
Acute diarrheic disease	-0.001 [0.010]	0,021 [0,097]	0,089 [0,156]
Acute respiratory infection	0.003 [0.016]	0,011 [0,157]	0,305 [0,210]
Chronic malnutrition	0.001 [0.011]	-0,170 [0,191]	-0,150 [0,191]

Robust standard errors in parentheses. \*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

Source: Colombian CHS (2006), Colombian DHS (2005) and HCB database. Sample is children whose parents are either married or cohabiting.

Instruments are local labor and marriage market variables (table 8)

1 : instrument is the probability of cohabiting, predicted through a probit including the above instruments.

2: Exclusion restrictions are the same instruments from column 2.

3: 1 to 3 index, where a lower number is better

4: 0 to 1 index, where a higher number is better

5: Instruments are county level instead of metropolitan area. F statistic was never above 2 in these cases.

Other covariates include income quintile, schooling level, age, household size, gender of head of household, and city and labor status fixed effects.

**Table 12**

<b>Heterogeneous effects</b>			
Variable	Cohabiting	Cohabiting x Quintile 1	Adjusted/Pseudo R-squared
<b>Outcome</b>			
<i>Schooling (children)</i>			
Schooling years	-0,189*** [0,030]	-0,134*** [0,052]	0,870
Lag	0,129*** [0,020]	0,0376 [0,032]	0,138
<i>Log hourly wage</i>			
Men (OLS)	-0,0418** [0,021]	-0,469*** [0,028]	0,416
Men (MLE)	-0,0790*** [0,026]	-0,477*** [0,028]	
Women (OLS)	-0,0621** [0,024]	-0,495*** [0,050]	0,388
Women (MLE)	-0,0211 [0,032]	-0,493*** [0,050]	
<i>Durable goods</i>			
TV	-0,0148*** [0,0052]	0,00322 [0,0067]	0,157
Home	-0,158*** [0,013]	-0,00102 [0,029]	0,198
Soundssystem	-0,0858*** [0,014]	-0,0104 [0,027]	0,113

Robust standard errors in brackets

\* Significant at the 10% level ; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level

Source: OLS, Probit and MLE estimates based on CHS(2006)

Income quintiles are based on monthly household income per capita.

Marital status and qualification is head of household's or individual's depending on outcome.

Other covariates are the same as tables 9-11

Table 13

Effects of Marriage by Duration of Cohabiting Relationship										
Marginal effects										
Covariate	Outcome	Durable goods ownership					Home	Men's log hr labor income	Women's log hr labor income	Schooling children <18yrs
		Telephone	Sound system	PC	Car	TV				
Cohabiting (less than 2 years)		-0,210*** [0,027]	-0,152*** [0,029]	-0,162*** [0,017]	-0,100*** [0,011]	-0,0816*** [0,013]	-0,110*** [0,026]	-0,266*** [0,033]	-0,134*** [0,044]	-0,427*** [0,092]
Cohabiting (more than 2 years)		-0,0928*** [0,0095]	-0,0694*** [0,013]	-0,132*** [0,012]	-0,0525*** [0,0096]	-0,00818*** [0,0027]	-0,139*** [0,013]	-0,138*** [0,021]	-0,0791*** [0,029]	-0,199*** [0,026]
X2/ F statisic of the difference		6,12**	12,62***	1,96	7,21***	35,51***	14,55***	0,05	1,6	8,66***
Observations		22824	22824	22824	22824	22824	22822	24688	27159	29352
Estimation Method		Probit	Probit	Probit	Probit	Probit	Probit	MLE	MLE	OLS
Adjusted/ Pseudo R2		0,2979	0,113	0,3166	0,2903	0,1402	0,2208			0,8774

Other controls include schooling, age, household characteristics, income quintile, and city and labor status/occupation fixed effects.

Controls are individual's/ head of household's depending on outcome.

Robust standard errors in brackets

\* Significant at the 10% level ; \*\* Significant at the 5% level ; \*\*\* Significant at the 1% level

Source: CHS(2006)

City and labor status (head of household) fixed effects included but not reported

Income quintiles are based on monthly household income per capita.

**Table 14**

<b>a. Weekly hours worked</b>		
	Men	Women
Cohabiting	-1.734*** [0.51]	1.201** [0.59]
Observations	26478	27609

Other controls include educational level, log hourly labor income, age,city and occupation fixed effects

total household members, hh members under 10 and under 1 and female head of hh.

Estimated by MLE (with selection bias correction).

Robust standard errors in brackets. Source: CHS (2006)

\* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level

<b>b. Woman's share of total hours worked by couple<math>\alpha</math></b>	
Covariate	
Cohabiting	0.0136** [0.0055]
Log hourly labor income	-0.0301*** [0.0041]
Husband/partner's log hourly labor income	0.0253*** [0.0053]
Observations	6582
R squared	0,14

Other controls include ed. level, log hourly labor income, age,city and occupation FE

total household members, hh members under 10 and under 1 and female head of hh.

Estimated by OLS. Robust standard errors in brackets

\* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level

Source: CHS (2006)

Table 15

Log monthly hours worked (women)	
OLS	
Covariate	
Wage gap $\alpha$	0.017** [0.008]
Wage gap x cohabiting	0.005 [0.011]
Cohabiting	0.052** [0.022]
<i>Schooling</i>	
Primary (incomplete)	0.148 [0.119]
Primary (complete)	0.077 [0.121]
Some highschool	0.045 [0.119]
Highschool graduate	0.134 [0.120]
Some college	0.093 [0.123]
College/University graduate	0.090 [0.121]
Age	0.000 [0.001]
Total household members	0.007 [0.008]
Household members under 10	-0.021 [0.015]
Household members under 1	-0.029 [0.031]
Female head of household	0.143*** [0.033]
Constant	5.201*** [0.145]
Observations	7265
R squared	0.12

Robust standard errors in brackets

\* Significant at the 10% level ; \*\* Significant at the 5% level ; \*\*\* Significant at the 1% level

Source: CHS (2006)

City and occupation fixed effects included but not reported

$\alpha$  Wage gap=husband or partner's hourly labor income/woman's hourly labor income

Sample is occupied women who are either married or cohabiting and whose husband/partner is occupied too.

Test of Hypothesis:  $H_0 = \text{wage gap} + \text{wage gap} * \text{cohabiting} = 0$

F=7,43 , p-value=0,0064.

Table 16

Adult health outcomes		
Marginal effects		
Covariate	Health status	Preventive medical appointment <sup>1</sup>
<u>Marital status</u>		
Cohabiting	-0.002 [0.011]	-0.025*** [0.009]
<u>Income Quintile</u>		
1st Quintile	0.199*** [0.020]	-0.134*** [0.012]
2nd Quintile	0.148*** [0.019]	-0.117*** [0.012]
3rd Quintile	0.110*** [0.019]	-0.076*** [0.012]
4th Quintile	0.039** [0.018]	-0.038*** [0.012]
<u>Educational level</u>		
Primary (incomplete)	-0.012 [0.018]	0.125*** [0.024]
Primary (complete)	-0.071*** [0.019]	0.181*** [0.027]
Some highschool	-0.143*** [0.018]	0.243*** [0.028]
Highschool graduate	-0.221*** [0.017]	0.305*** [0.030]
Any technical/ technological	-0.221*** [0.020]	0.382*** [0.036]
Some college	-0.274*** [0.018]	0.404*** [0.043]
College/University graduate	-0.287*** [0.014]	0.420*** [0.033]
<u>Other controls</u>		
Female	0.120*** [0.010]	0.068*** [0.008]
Age	0.009*** [0.000]	-0.002*** [0.000]
Total household members	-0.001 [0.003]	-0.002 [0.003]
Urban	-0.044*** [0.013]	0.038*** [0.011]
Observations	25530	25527
Pseudo R squared	0.1673	0.1441

Robust standard errors in brackets

\* Significant at the 10% level ; \*\* Significant at the 5% level ; \*\*\* Significant at the 1% level

Source: Probit estimates based ECV(2003) ; Sample is people 25 and older.

Quintiles are constructed upon per capita household income

Regional and ethnic fixed effects included but not reported

Health status: risk of considering one's health as good or very good

Preventive medical appointment (last year):

1 Both medical and dental preventive appointments

2 Any medical preventive appointment

Table 17

	Mother's behavior during last pregnancy				
	Marginal effects				
	Outcome				
	Pregnancy was not planned	Drank alcohol during pregnancy	Smoked during pregnancy	Newborn was not registered	# of pre-natal controls
Covariate					
<i>Marital status of the mother</i>					
Cohabiting	0,093*** [0,024]	0,051*** [0,016]	0,003 [0,008]	0,006*** [0,002]	-0,264 [0,164]
<i>Wealth Quintile</i>					
1st Quintile	0,014 [0,044]	-0,019 [0,027]	-0,007 [0,010]	0,026* [0,016]	-1,118*** [0,258]
2nd Quintile	0,011 [0,042]	-0,012 [0,025]	-0,004 [0,010]	0,02 [0,014]	-0,775*** [0,249]
3rd Quintile	-0,022 [0,041]	0,001 [0,029]	-0,012 [0,008]	0,016 [0,014]	-0,482* [0,259]
4th Quintile	0,036 [0,043]	0,026 [0,031]	-0,002 [0,011]	0,005 [0,010]	-0,465* [0,267]
<i>Educational level (mother)</i>					
Primary (incomplete)	-0,256 [0,165]	0,948*** [0,006]	0,974*** [0,024]	-0,008*** [0,003]	-2,665*** [0,924]
Primary (complete)	-0,217 [0,199]	0,968*** [0,006]	0,969*** [0,036]	-0,010*** [0,004]	-2,299** [0,920]
Some highschool	-0,222 [0,227]	0,972*** [0,015]	0,866*** [0,095]	-0,015* [0,008]	-2,173** [0,913]
Highschool graduate	-0,213 [0,237]	0,940*** [0,028]	0,677*** [0,137]	-0,022* [0,012]	-1,714* [0,915]
Some college	-0,219 [0,198]	0,975*** [0,008]	0,907*** [0,086]	-0,012*** [0,004]	-1,298 [0,941]
College/University graduate	-0,222 [0,180]	0,952*** [0,005]	0,878*** [0,119]	-0,008*** [0,002]	-1,496 [0,967]
<i>Other controls</i>					
Total household members	0,006 [0,004]	-0,003 [0,003]	0,000 [0,001]	0,001*** [0,000]	-0,090*** [0,025]
Current age of the child	0,023*** [0,006]	0,002 [0,005]	0,003 [0,002]	-0,004*** [0,001]	0,059 [0,041]
Age of mother	-0,014*** [0,002]	-0,002 [0,001]	0,000 [0,001]	-0,000* [0,000]	0,031*** [0,012]
Child is a girl	0,000 [0,020]	-0,006 [0,014]	0,000 [0,006]	0,003 [0,002]	0,106 [0,126]
Urban	0,032 [0,026]	0,009 [0,017]	0,014*** [0,005]	-0,010** [0,004]	0,11 [0,144]
Constant					9,019*** [1,034]
Observations	4136	2821	2821	4136	2707
Adjusted/Pseudo R squared	0,045	0,035	0,114	0,253	0,100

Robust standard errors in brackets. \* Significant at the 10% level ; \*\* Significant at the 5% level ; \*\*\* Significant at the 1% level

Source: Probit and OLS estimates based Colombian DHS(2005)

Income quintiles are constructed based upon household characteristics. Regional fixed effects included but not reported



**Table 18**

<b>Risk of having been victim of domestic violence<sup>1</sup> (women)</b>	
Marginal effects	
Covariate	
<i>Marital status of the mother</i>	
Cohabiting	0.057*** [0.009]
<i>Wealth Quintile</i>	
1st Quintile	0.055*** [0.016]
2nd Quintile	0.073*** [0.014]
3rd Quintile	0.044*** [0.014]
4th Quintile	0.009 [0.013]
<i>Educational level (mother)</i>	
Primary (incomplete)	-0.150*** [0.043]
Primary (complete)	-0.159*** [0.043]
Some highschool	-0.181*** [0.045]
Highschool graduate	-0.215*** [0.042]
Some college	-0.213*** [0.036]
College/University graduate	-0.264*** [0.027]
<i>Other controls</i>	
Total household members	0.002 [0.002]
Age	0.002*** [0.001]
Urban	0.027*** [0.009]
Observations	25903
Pseudo R squared	0.0270

Robust standard errors in brackets.

\* Significant at the 10% level ; \*\* Significant at the 5% level ; \*\*\* Significant at the 1% level

Source: Probit estimates based Colombian DHS(2005)

Income quintiles are constructed based upon household characteristics

Regional fixed effects included but not reported

<sup>1</sup> Husband/partner has pushed, dragged, hit, bit, kicked, hit with an object, threatened with a knife or gun, wounded with a knife or gun, attempted to burn or strangle, or raped her.

Figure 1

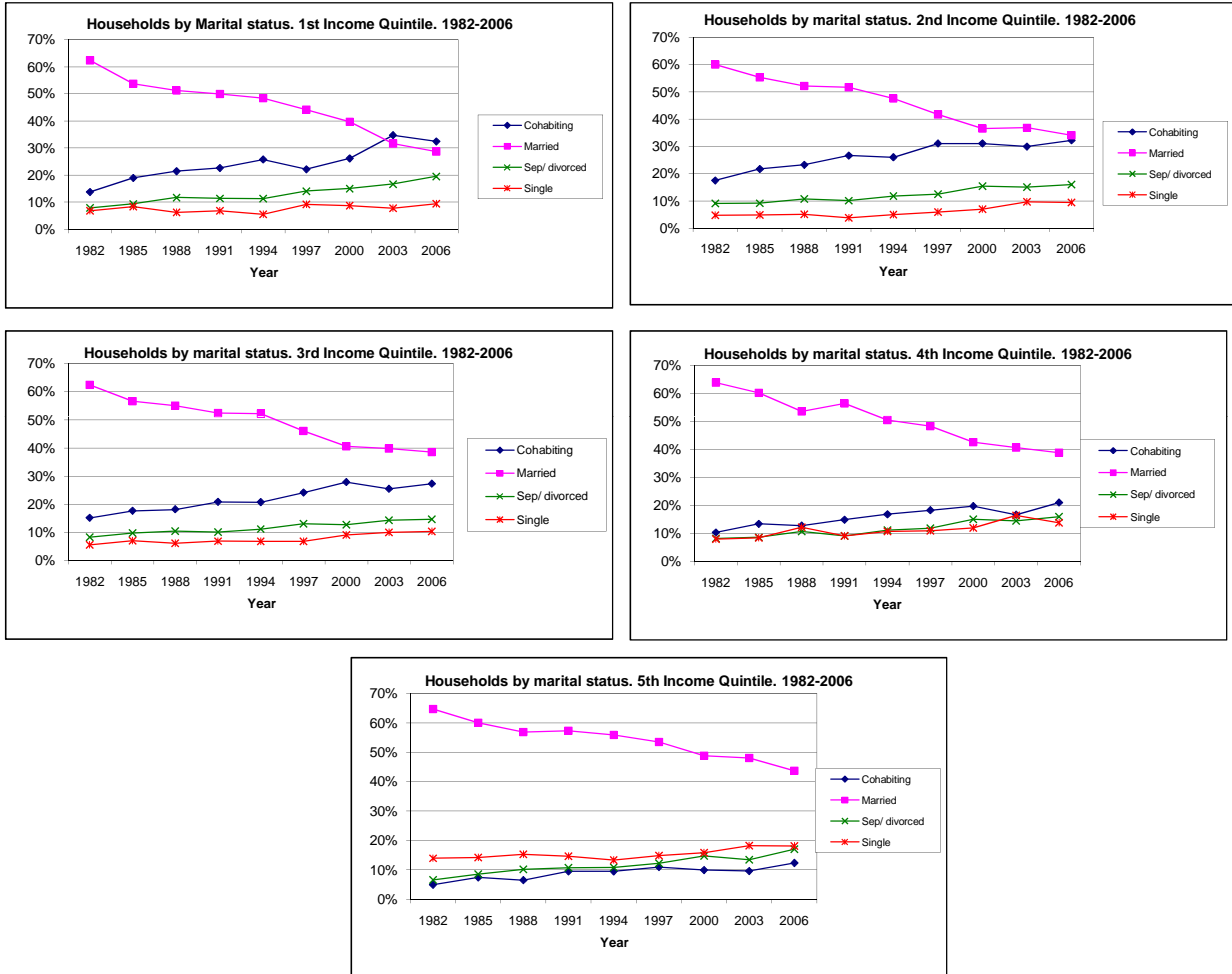


Figure 2

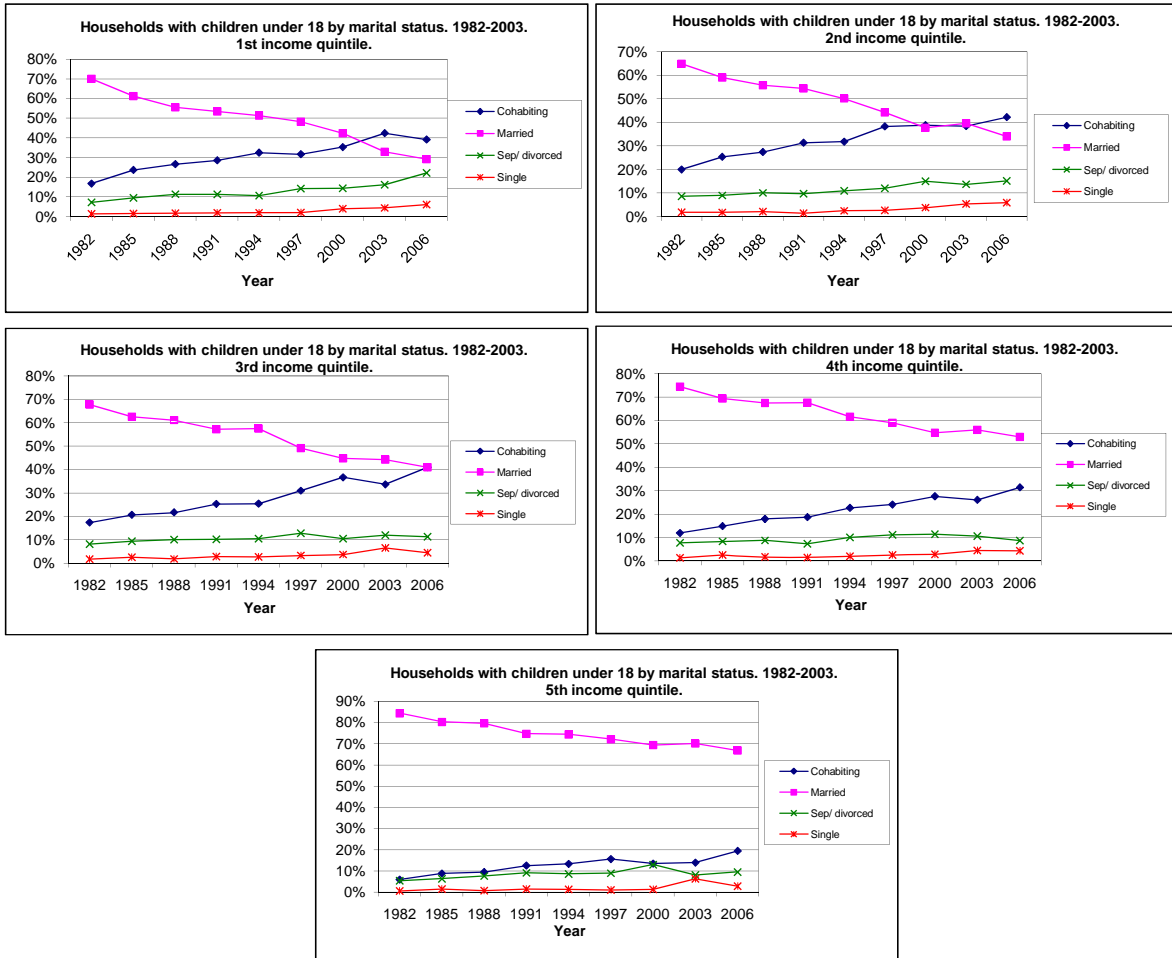
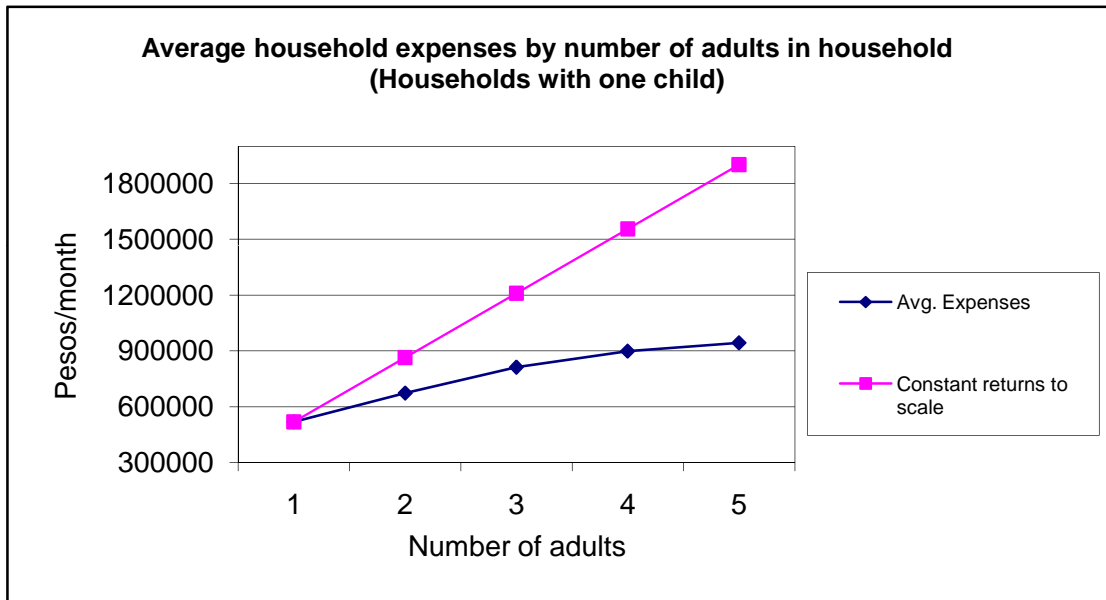


Figure 3



Source: ECV 2003