The gender bias and children's work: Spain, Latin America and Developing countries in a long run comparative perspective.

Enriqueta Camps-Cura

(Economics and Business Department, Pompeu Fabra University.
 Barcelona Graduate School of Economics)

Abstract: In this paper we compare several historical scenarios very different one to each other both in institutional and geographical terms. What they have in common is the situation of relative poverty of part of the population. This approach allows us to combine the micro historical analysis (in the Catalan case) with the macro comparative approach in current developing countries. By means of both, the micro historical analysis and the macro regression analysis we obtain the result that adult women's skills and real wages are a key factor when we want to explain the patterns of children work. While female real wages increased at a sharp rate in 19th century Catalonia we obtain very different results in the case of developing countries. We identify this gender bias as some of the very significant effect of human capital held by women that helps to explain why in some cases children continue to work and also why some parts of the world continue to be poor according to our regression analysis.

1. INTRODUCTION: THE HUMAN CAPITAL TRASITION.

Laboring families, on the side of labor supply, and firm's labor preferences on the side of labor demand can explain the reasons why children work in different scenarios. On the side of the family, and during the demographic transition, children's work represented a very flexible asset providing security in unstable worlds (Basu, Hoan Ban, 1998). They allowed their parents to confront adverse economic situations caused by the business cycle (like the rise of unemployment in the formal economy) or the family cycle (this was the case when parents were growing old and they had to rely on their children as the main source of income of the family economy).

On the side of the demand for children's labor, in backward societies, such as 19th century Spain or current developing countries, firms had a preference for cheap (in absolute terms) economic resources and production factors without making the economic calculation of their opportunity cost and productivity yields. Training children through the apprenticeship system was the alternative that the factory provided to formal education necessary to acquire the skills to deal with factory or farm work. By means of the apprenticeship system children learnt the know how of industrious factory skills, dexterity and discipline and adaptation to the firm hierarchy. On the other hand children, the same as women, were less conflictive than adult men. In the Catalan context riots and strikes caused by trade unions to fight against low wages intensified the use of women and children instead of adult men. This choice came together with the change of location of the industries themselves that moved from urban ports such as Barcelona (points of arrival of the British coal) to rural settings that could make use of the free energy of water and where male trade unions were absent (Camps, 2011; García Balañà, 2005; Llonch 2004).

While during the 19th century geography of industry has been considered very dependent on natural resources and coal, at the beginnings of 20th century the spread of the second technological revolution brought with it increasing demands of education and human capital both on the side of employers and employees. Endogenous theories of growth began to apply in the sense that labor ceased to be a production factor per se, but also owned capital, human capital, which in turn increased al lot levels of labor productivity.

In backward societies the beginnings of the human capital century (Goldin, Katz, 2008) put into operation several shocks that affected the family size and composition and also the rationale of laboring families. More expensive education and training of children who postponed the age of entry into the labor market affected the family budget restriction and a "trade of" between "quantity (that is fertility levels) and quality (that is levels of education)" of children was put into operation. Fertility levels diminished while children who in the Catalan scenarios of the 19th century began to work at the age of 7 postponed this vital event to the age of 12 at the beginnings of the 20th century when they had completed mandatory primary school. Or to put it in other words, in the new situation there were less children that had attained higher levels of education. This may have had very clear effects on productivity levels. It was an engine stimulating growth of capita GDP as a consequence of human capital accumulation and also a result of lower demographic pressure on economic resources relative to the situation when fertility levels were very high (Camps, Engerman, 2014). The question we want to answer here is how this process begins.

2. A MODEL OF THE TRANSITION TO THE HUMAN CAPITAL CENTURY IN SPAIN.

Recent research on developing countries has stressed the role of literate and skilled working mothers in this trade of between the "quantity and quality" of children. In the Spanish case Baizan, Camps (2007) could identify, by means of a longitudinal analysis of the vital events of women from the cohorts of birth 1900-1950, that the education levels of the mother had a very significant impact on the education levels of their children and also on the education levels of their grandchildren. The data source, the Spanish Socio Demographic Survey of 1991 (SSS) did not allow us to identify the role of the father in this process. We know that the marriage market in historical Spain was very homogamic and a normal outcome of this fact is that and educated women married educated men. But in historical Spain the gender roles of men and women were very clearly identified and while the role of men was considered to be breadwinning, the primary role of the women was de social and demographic reproduction of the household. Therefore we are assuming here that the education levels of mothers (more

than the education levels of the fathers) affected the education of the children since they were the responsible persons for rearing and bearing them and also for their education as a complement of school. Of course we imply here that recent developments of household work distribution between husband and wife that begin to share all experiences from both of the two big sources of work of the household, production (paid labor for an income) and reproduction (rearing and educating children) did not apply to the past. This is an empirical result we obtain from all censuses or demographic lists available.

Another of the very important result by Baizan; Camps (2007) is that the most significant variable explaining fertility levels was the education of the mother. According to the coefficients and levels of statistical significance this variable is more important than commonly used economic variables used by the literature, such as the difference between urban and rural or sector of employment. SSS does not provide information on religious beliefs which have been identified by Dreze and Sen and Sen as a very important information to explain women's activity both in economic production and demographic reproduction. But during most of the period considered in this essay Spain was under a National Catholic political regime and most of the people were practicing Catholicism the same as in Latin America.

From results obtained in the Spanish case we can conclude that fertility and the education of the children are endogenous to the education levels of the mother:

(1) $Fi = f(Hmi)$ and   (2) $Hi = f(Hmi)$

Where Fi are the Fertility levels at year i; Hi are the number of years spent at school by children at year i; and Hmi are the education levels of mothers at year i.
We can also express economic growth as a function of production factors, human capital accumulation and the rate of demographic growth. In the aforementioned context of backwardness and in order to simplify the model we also assume that mortality conditions don't improve and therefore demographic growth is a function only of fertility levels evolution even if this hypotheses, as we will see, does not apply to the developing world of the 20th century.

(3) $Yi = f(Ki, Li, Ti, Hi, Pi)$

Where levels of per capita GDP (Y_i) are a function of levels of industrial capital (K_i), labor (L_i), land (T_i), human capital (H_i) and demographic growth $P(i)$. Since in order to simplify the model we assume that demographic growth only depends on fertility levels, growth of the labor force depends on growth of fertility levels:

(4) $P_i = F_i$

       i

(5) $L_i = L_o (1+F_i)$

From what we have assumed at (1), (2) (4) and (5) we can reformulate (3) as follows:

(6) $Y_i = f (K_i, H_{mi}, L_o, T_o)$;

  Where L_o (labor in the starting point) and T_o (land) are constants.

Therefore we assume in the model born from the Spanish experience that levels of growth of per capita GDP finally depend on the levels of growth of industrial capital and levels of growth of the education adult women while labor and land are constant.

3. THE DATA.

Conclusions for Spain come from the Socio Demographic Survey of 1991 and data on female real wages and fertility have been published in by Camps (1995) Llonch (2004) and Cabré (1999). The data used for the international comparisons have been taken from several data sources. Data on women's and children's work, infant mortality and life expectancies can be found in World Bank datasets. Data on females income, gender gap and women empowerment come from United Nations (2005): Human Development Report. Data on religious beliefs and ethnic diversity come from the dataset on economic fractionalization by Alesina et alt. (2003). Data on income inequality come from Klaus Deininger and Lyn Squire (1996): A New Data Set Measuring Income Inequality", World Bank Economic Review, 10:3. Data on per capita GDP come from the World Penn Tables and data on education from Barro and Lee.

4. THE HISTORICAL EVIDENCE FROM CATALONIA AS A SPANISH CASE STUDY.

During the first third of the 20th century, and contemporary to the diffusion of the second industrial revolution, physical and human capital shocks sharply transformed Catalan family economies. Between 1860 and 1930 the literacy rates of Catalan population rose from 24 per cent to 82 per cent and the educational gender gap (calculated as the difference between illiteracy of women and men) diminished from 28 to 12 per cent among the same dates. Together with this set of events women's real wages in the textile mills more that doubled in the same period (see Figure 1).

INSERT FIGURES 1 AND 2 AT ABOUT HERE.

According to Montserrat Llonch (2004) women's human capital was acquired in trade schools (Escola Industrial) that offered vocational training specially adapted to the Catalan textile mills, which moved from town to the countryside using the free energy of water and avoiding labor conflicts caused by anarchist trade unions. Between 1920 and 1930 women's hourly wages increased in an absolute percentage of 70 per cent. The sharp increase of the price of women's time (real wage) increased the opportunity cost of time devoted to unpaid household demands for labor. This had as a consequence the sharp reduction of fertility which attained its minimum of 1,9 (below replacement) as soon as in the years 1930s (legitimate fertility of women of the birth cohort 1910-1914 (Cabré, 1999) –see figure 1-. The improvement of the education of mothers as we have exposed following the model by Baizan, Camps (2007) was an engine improving the education levels of the children. But this was not the single effect. The important improvement of women's real wages gave the family some of the

financial bases to remove children from the labor force. As we stated above it allowed children to postpone the age of entrance to the labor market from 7 to 12.

Therefore in the Catalan case we can clearly identify the effect of the mother's education levels on children's work, education, and fertility and therefore on human capital formation. What is not so clear is the role of this education on improvements on economic growth. According to all estimations Spanish economy only began to grow with vibrancy after 1960. The main reason that explains why Spain did not significantly grew before, are the social conflicts of this period. The opposite and conflicting interests between land owners and owners in general, the clergy and religious institutions, old policy makers and the army among others social groups and the new enlighten and educated working class, liberal professions, new educative institutions brought by the republican governments and new republican politicians caused an armed confrontation during the years of the civil war (1936-1939) that was responsible for negative rates of growth of per capita GDP and was followed by a decade of economic autarchy and virtual economic isolation. Therefore social tensions and political confrontation in the years 1936-39 till the years 1960s caused a draught back in economic growth measured by per capita GDP (Prados de la Escosura, Rosés, 2009). In spite of the achievements attained in the fields of human capital and fertility evolution other historical factors did not allow Spain to grow according to the human capital transformation that the country was experiencing.

5. HUMAN CAPITAL AND CHILDREN'S WORK IN CURRENT DEVELOPING COUNTRIES.

One of the most positive consequences of the second globalization era in the years from 1970s to the present has been the improvement of the human capital stock of poor countries, particularly in countries of Latin America and South and East Asia (see Camps, Engerman, 2014). Many authors committed with world's economic development have been dealing with these transformations that are more visible if we search the results in variables that affect the quality of life than in variables related to wealth and income. When we want to grasp on the origins of this current transformation, as opposed to the model we built when we were trying to analyze the

lessons from the past in Spain, it is important to stress the fact that during the 19th century, and as a result of industrial revolution and the first global era levels of per capita GDP between countries (between countries inequality) began to diverge –see Williamson (2008)- but this trend to diverge at the country level increased during the first part of the 20th century (Sala-i-Martin, 2006). In contrast the second globalization era places us in a new context in which a new trend towards convergence started (Sala-i-Martin, 2006). But it is important to stress the fact that some of the outcomes of economic openness during the second globalization era have been affecting more clearly human capital spheres of ordinary people's life including health and life expectancies, infant mortality, scientific knowledge, educational infrastructure and services, more than levels of wealth and income (Camps and Engerman, 2014).

One of the better explored aspects of these achievements has been the improvement of life expectancies (Becker, 2005) and infant mortality (Bloom, Williamson, 1998). In the years 1960-2000 in many poor countries this transformation has been very outstanding and this is the reason why world population has been growing during the last part of the 20th century. But what we want to stress here are the remaining problems that obscure a positive feedback of human capital accumulation on economic growth (the same as in the micro historical analysis we made in the first part of the paper).

In current poor countries the same as in the Spanish historical scenarios presented in the first part of the paper we observe that the activity rates of women and children are high, sometimes very high. But it is important to stress that the nature of this labor is very different from what we were trying to describe when we analyzed the Spanish (Catalan) case.

INSERT FIGURE 3 AROUND HERE.

It is possible to report using the time budgets built by the Human Development Report (2003) of current poor countries that the number of hours women can allocate to paid production per day is lower or equal than 4 while domestic chores imply a dedication of 6 and 7 hours per day. Housework technologies are very difficult to globalize since they affect family formation patterns which in turn can be partly explained by social capital variables such as religion and culture. In many countries of Africa, Latin America and South Asia competing demands of women's time for paid

and unpaid work do not allow them to fully develop their human capital capabilities and those of their children. The very different nature of women's work in poor countries has further implications, because in this case their paid activity is positively correlated with infant mortality and illness. In turn these poor countries where women and children are still working in the informal sector of the economy are the countries showing higher levels of within the country inequality of income distribution.

Insert figures 5, 6, 7, 8 around here.

In figure 9 we plot the Gini coefficients of income distribution by Deininger and Squire (1996) data for years 1990-1995 and its relation with the gender gap and we obtain a slight negative correlation. The effect of the Ginis of income inequality of the economy on the gender gap is nearly constant. On the other hand the relationship between Gini and children's participation in the labor force is positive and if we exclude countries where children don't work is U shaped. Children's work is more intense in very unequal countries and in countries that are too poor to exhibit very high Ginis. Several authors have stressed that economic inequality achieve lower values in open economies and in countries where women are more visible in public and professional decision making (women empowerment). All these events occur more easily in egalitarian societies than in extremely unequal ones were most women have low access to human capital services for them and also for their children.

Insert figures 9 and 10 around here.

The results from the regression analysis are consistent with the model we made explicit in part 2 of the paper. In table 1 we see that children's work continues to exist in extremely gendered societies were the human capital of women is very low in absolute and in relative (to men) terms, and fertility levels are high. In table 1 we can see that the intensity of children's work is negatively correlated with the human capital of women and this variable (also human capital of women/human capital of men) has a high coefficient and a statistically significant result. On the other hand the sign of the coefficient of fertility is positive and this fact implies that the countries with the highest

size of the offspring in average terms are also those exhibiting highest rates of children's work. According to table 2 this has further implications on economic growth. The rate of participation of children in the labor force has negative effects on the level of per capita GDP while religious beliefs have a much lower impact on economic growth than the gender bias.

Insert tables 1 and 2 around here.

In a comparative framework the poorest countries from Africa are those with more severe mortality conditions, highest fertility levels (Camps and Engeman, 2014) and also highest income inequality and gender gap. But notice also that the levels of the gender gap are high in some of the Latin American countries in contrast with countries of South and East Asia. We also see in figure 5 that Latin America a the continent with high variance in life expectancies, with results between 50 and 75 years at the end of the 20th century. But in richer countries where the gender bias is low and the participation of children in the labor force is also low both infant mortality and life expectancies have improved. In figures 11 and 12 we present the evolution of female years of schooling and children participation levels in the labor force in Latin American countries in the period 1960-2000. Notice the trend of female years of education to increase and the trend of children levels of labor participation to decrease in all countries. Therefore the human capital century has also reached Latin American countries and better levels of education both for men and women have implied the improvement of living conditions. On the other hand these achievements, specially the removal of children from the labor force have stimulated economic growth by means of the improvement of education levels (Reimers, 2006). But the same as in the Spanish case other economic factors have fostered low levels of economic achievement. After the ISI period, during the 1980s the foreign debt payments problems implied serious adjustment measures that sacrificed levels of consumption and investment and economic development in some of the Latin American countries.

6. CONCLUSION

The 20th century has significantly been labeled as the human capital century. In this paper we have reported some key features of human capital in developing countries and more specifically in Latin America by focusing on key aspects of women and children labor market participation levels in a comparative framework. While in Catalonia and parts of Spain the increase of the levels of education of women and children was a process that began in the 19th century and took place during the all the 20th century, in developing countries and more precisely in Latin America the process of educational reform was slow and began in the 20th century (Reimers, 2006). Uneducated mothers with low levels of income conceived uneducated children that were soon part of the labor force. During the 20th century this process has a higher intensity in the poorest countries of the world that exhibit high female and child participation levels in unskilled occupations of the informal sector of the economy. But at least in the Latin American case we have proved the trend towards the improvement of women's and children's laboring condition during the recent past. The increase of levels of education of women brought with it the decline of levels of participation by children and the improvement of demographic conditions ((infant mortality and fertility) Camps and Engerman (2014)). This has further implications for the acceleration of economic growth in the 21st century but this is not part of our history.

FIGURE 1. Women's real wages and fertility evolution: the Catalan case, 1900-1935.

FERTILITY AND WOMEN'S REAL WAGE. THE CATALAN MODEL
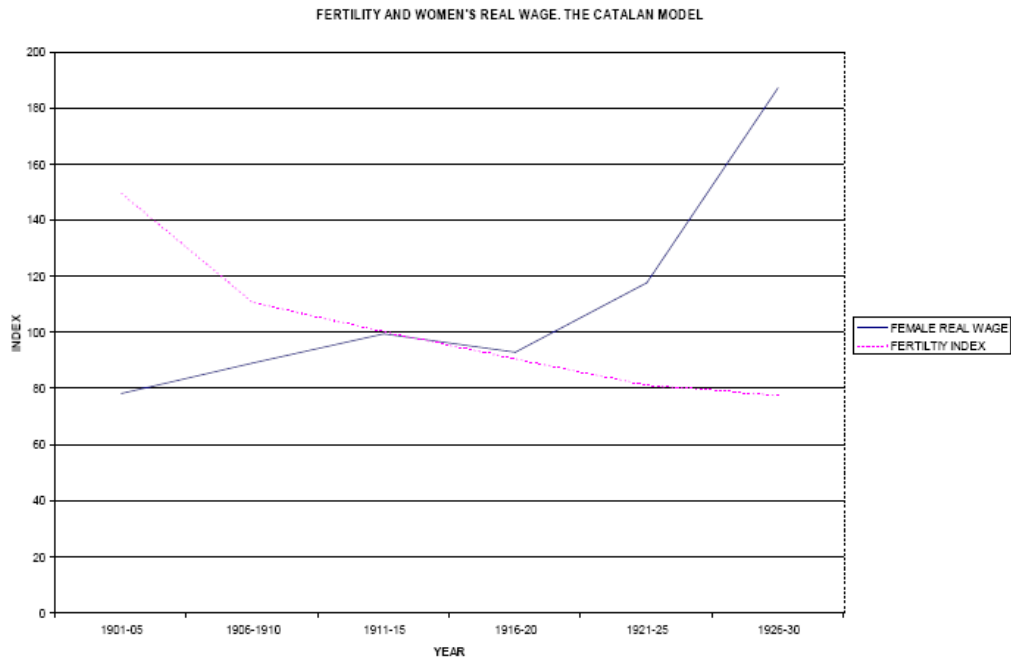
FIGURE 2. THE HUMAN CAPITAL TRANSITION AND LABOR MARKET DYNAMICS
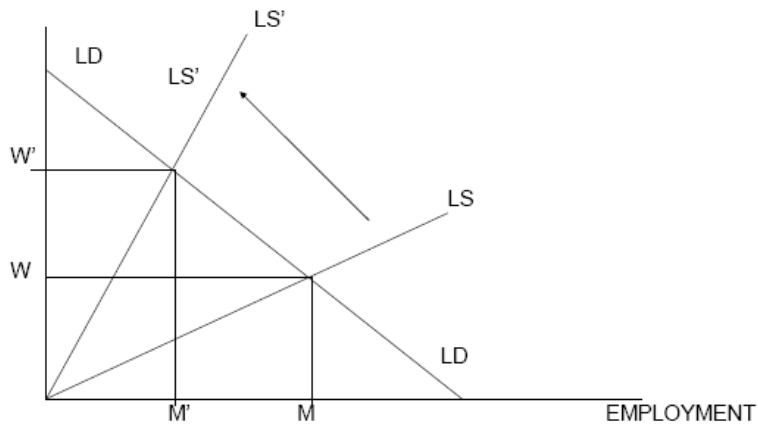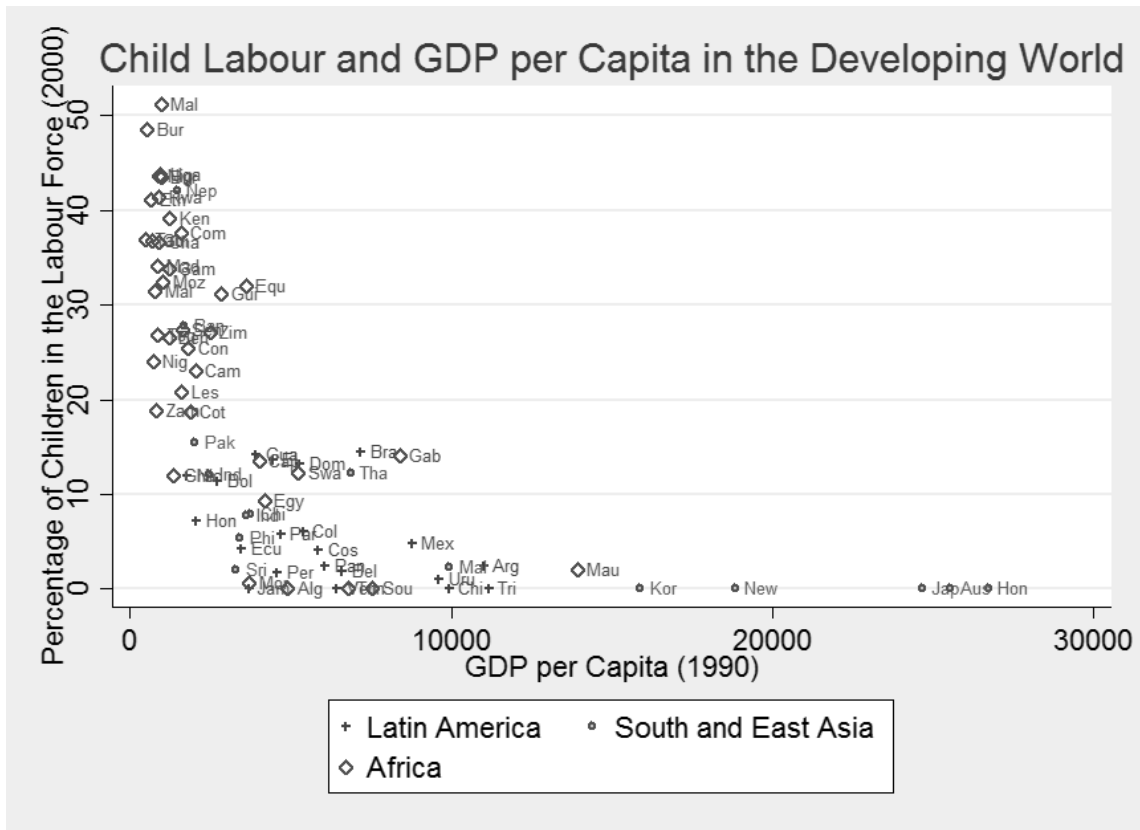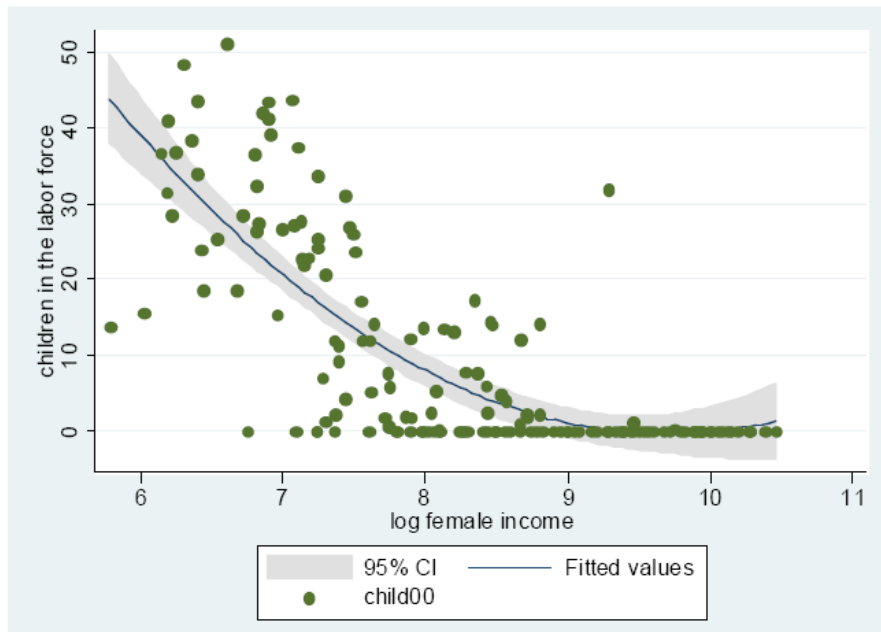
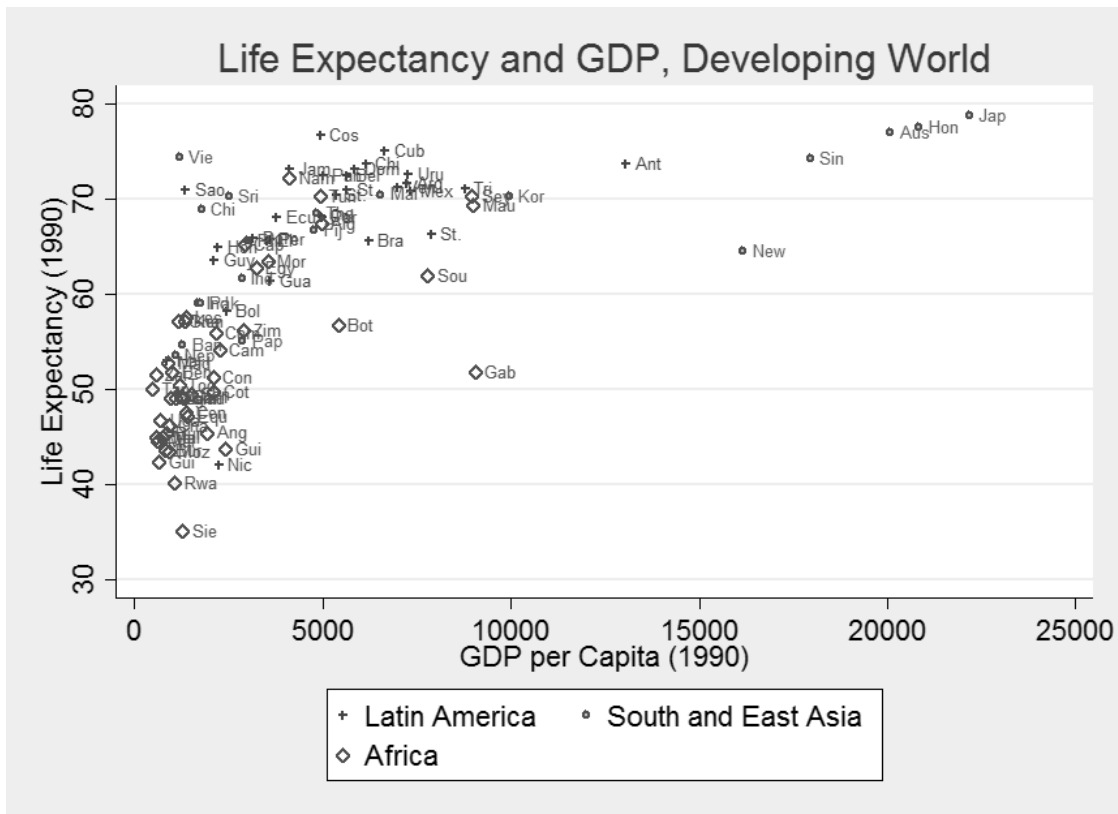FIGURE 3.

Child Labour and GDP per Capita in the Developing World

FIGURE 4. CHILDREN'S WORK AS A FUNCTION OF WOMEN'S EARNINGS. WORD WIDE SAMPLE, 2000-2003.

FIRURE 5.

Life Expectancy and GDP, Developing World

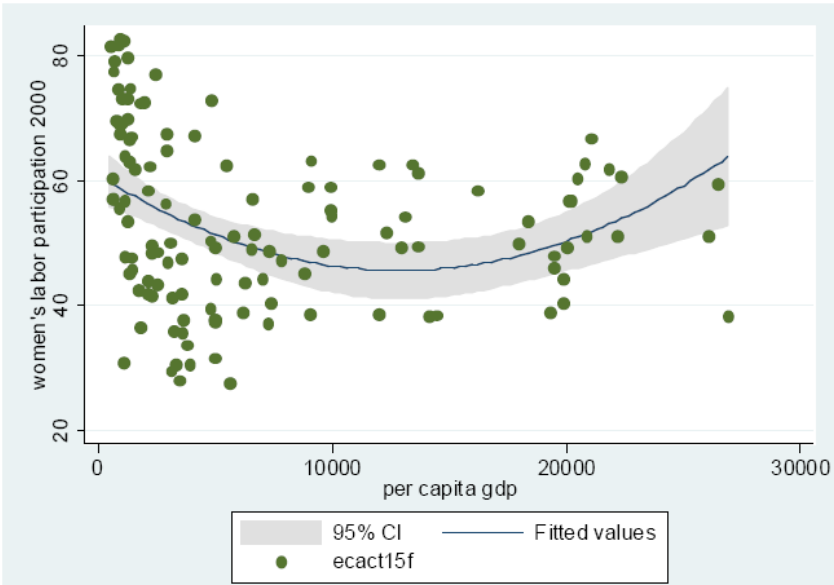**FIGURE 6. THE U SHAPED FEMALE LABOR PARTICIPATION FUNCTION IN DEVELOPMENT. WORLD WIDE SAMPLE, 2000.**
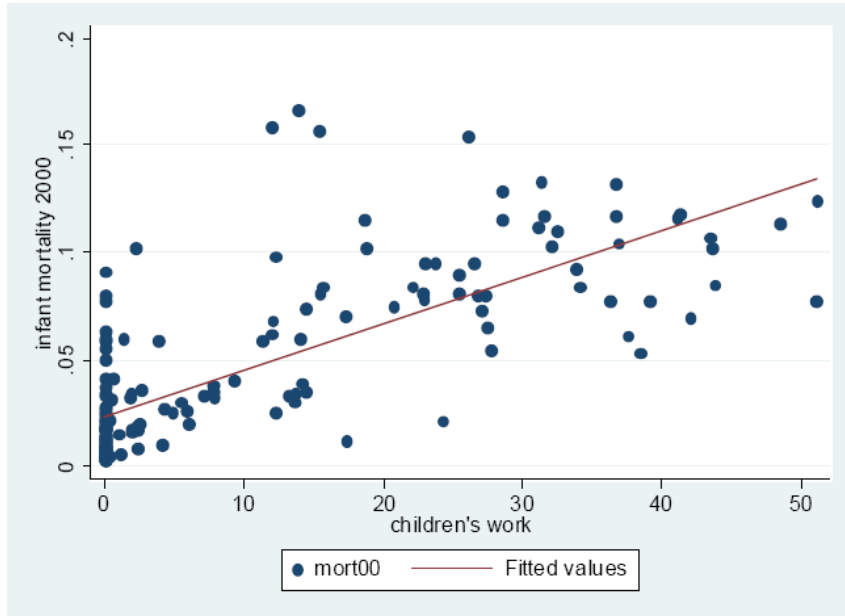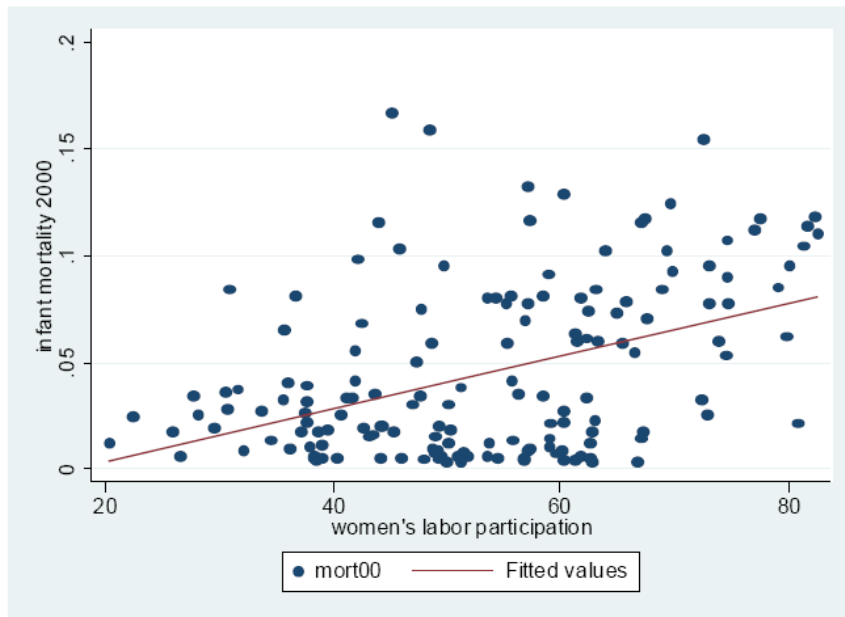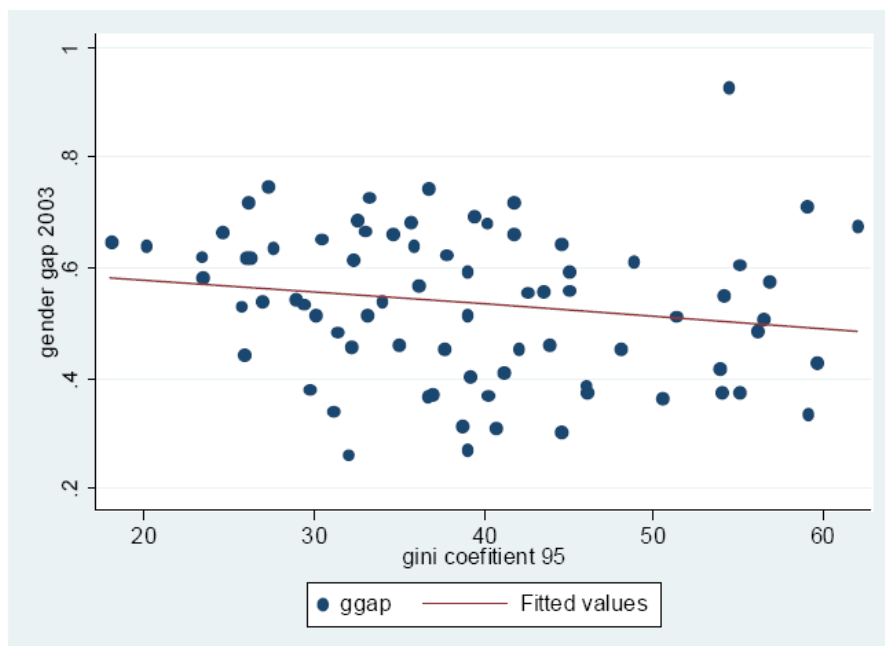
FIGURE 7. THE INFLUENCE OF CHILDREN'S WORK ON INFANT MORTALITY. WORLD WIDE SAMPLE, 2000.

FIGURE 8. THE INFLUENCE OF FEMALE LABOR PARTICIPATION IN INFANT MORTALITY. WORLD WIDE SAMPLE, 2000.

FIGURE 9. THE RELATIONSHIP BETWEEN THE GENDER GAP (income female/income male) AND ECONOMIC INEQUALITY.

**FIGURE 10. THE RELATIONSHIP BETWEEN CHILDREN'S WORK AND
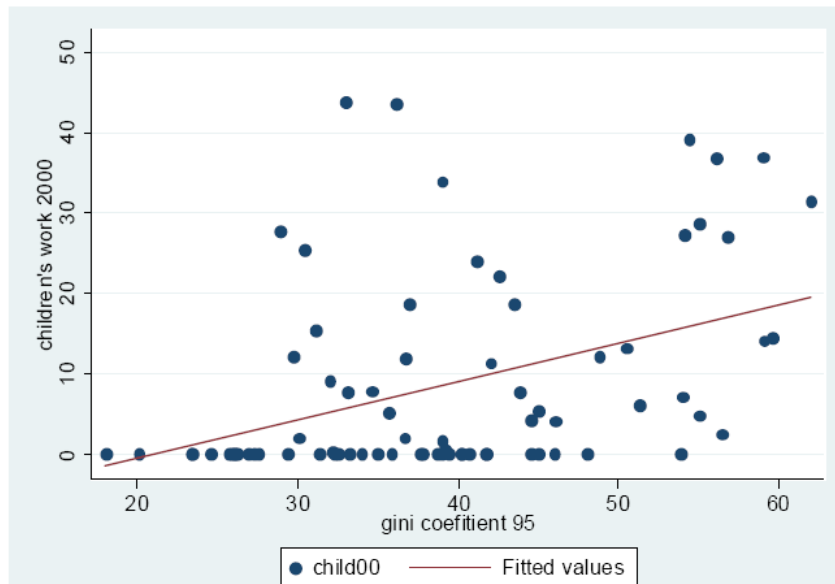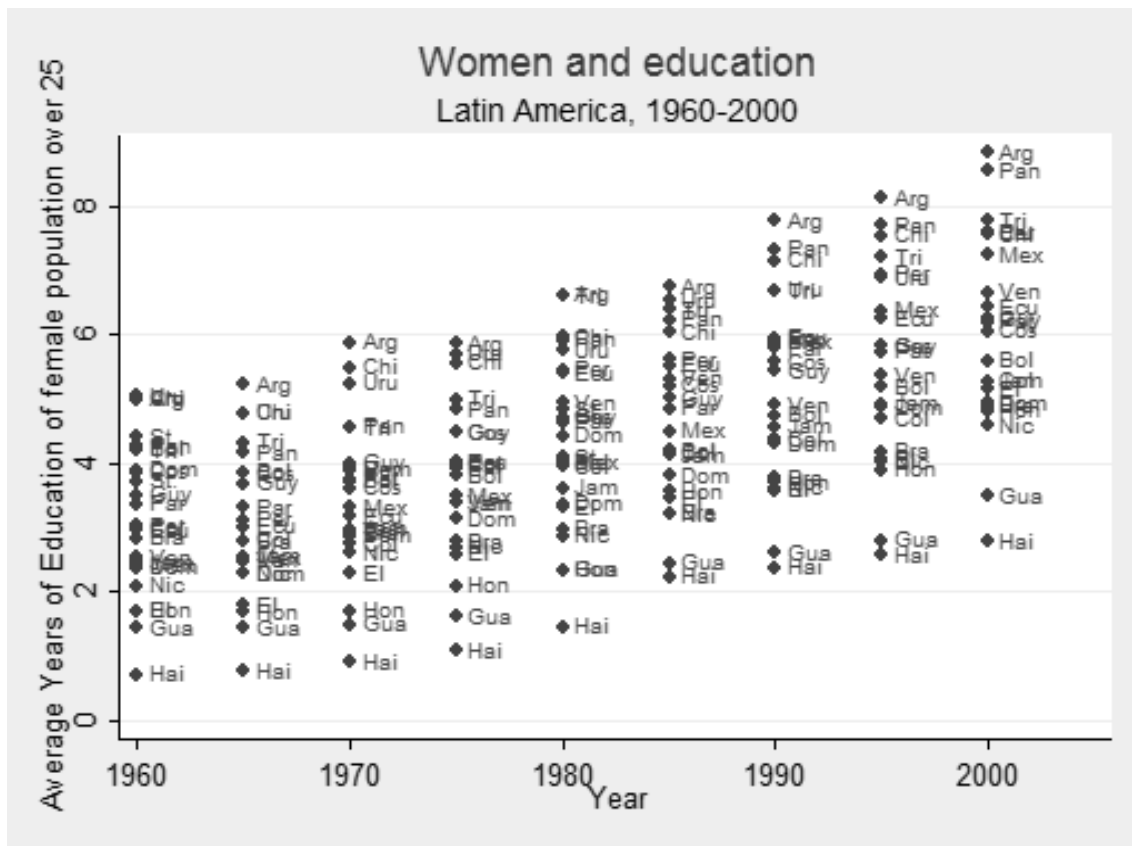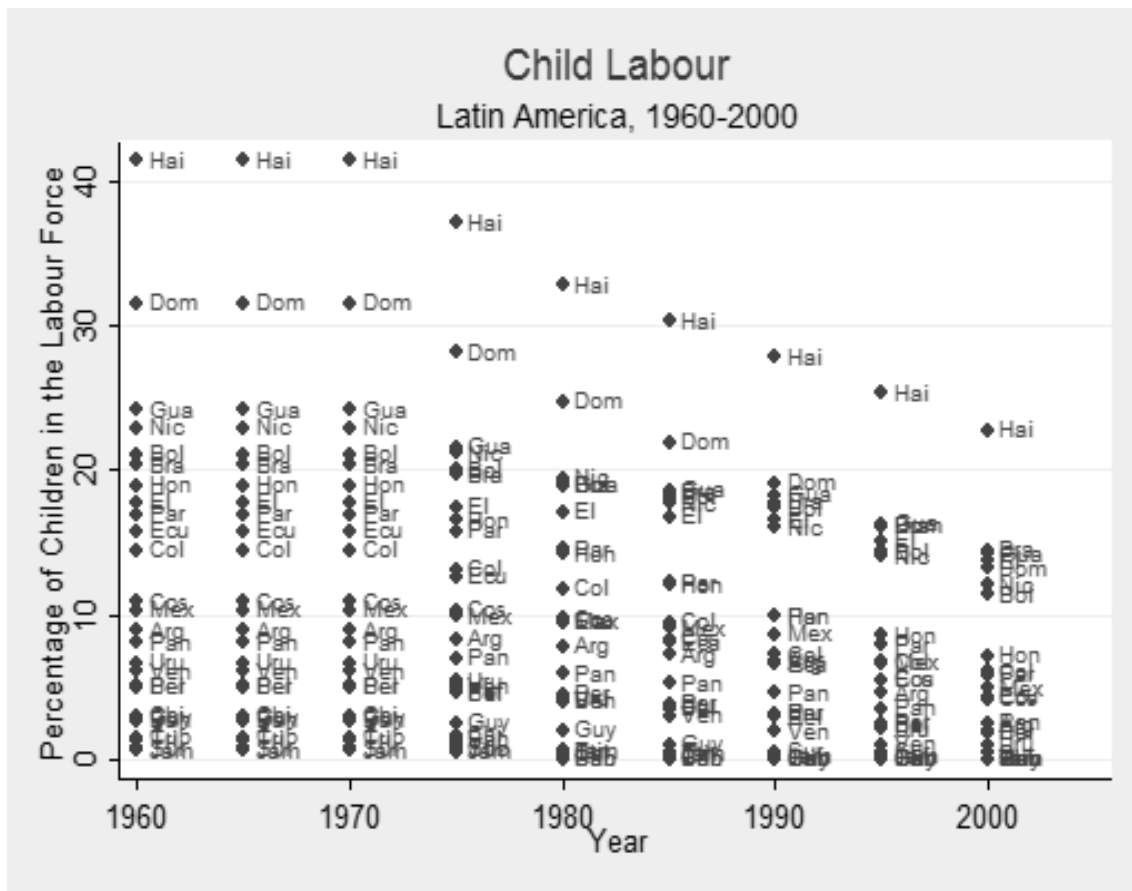ECONOMIC INEQUALITY.**

FIGURE 11.

Women and education
Latin America, 1960-2000

FIGURE 12.

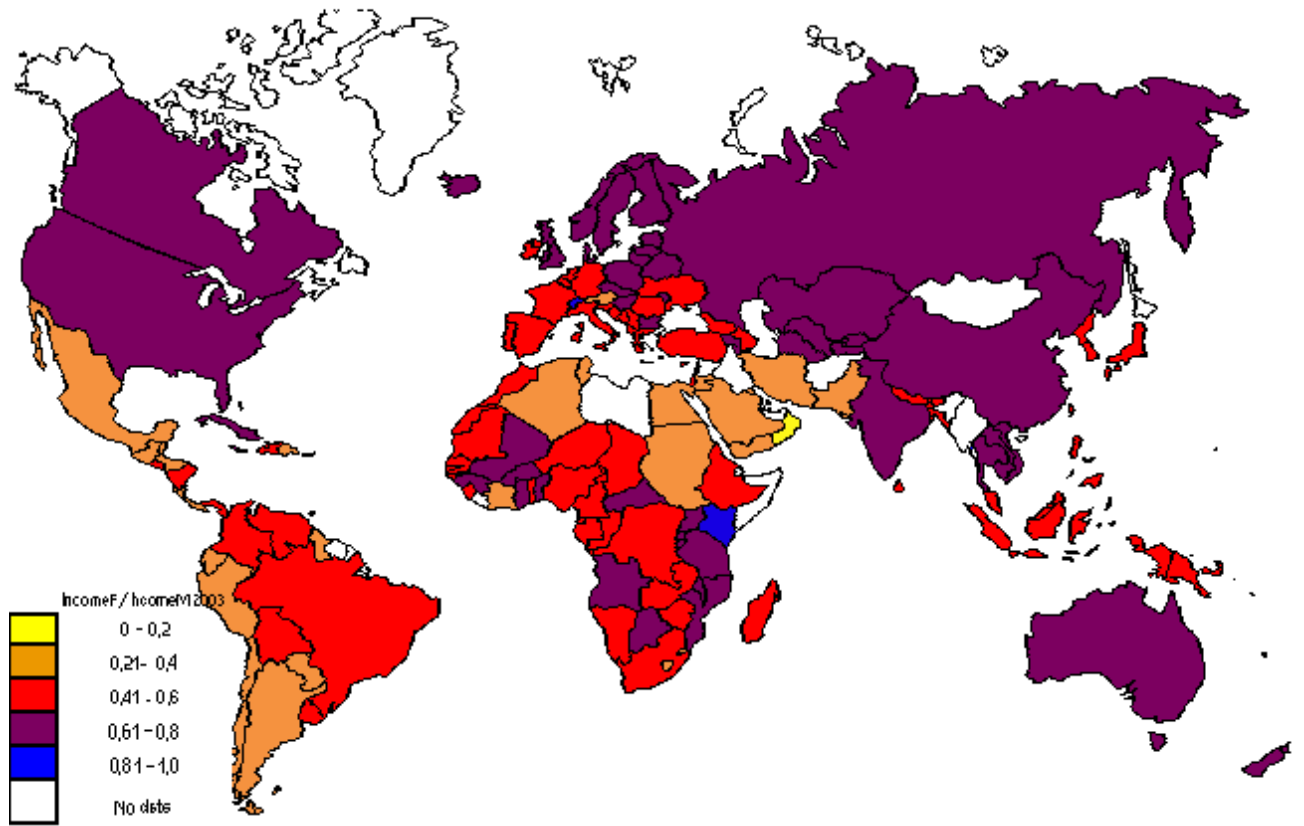Child Labour
Latin America, 1960-2000

Table 1: Explaining Children's work in nowadays developing countries. An across country panel linear regression, 1960-2000.

Dependent Variable: Percentage of children aged 10-14 in the labor force	
Log per capita GDP	-0.273 (0.231)
Years in school women/men	-0.740 (0.007)***
Years in school women	-0.885 (0.152)***
Mother's mortality at birth	-0.001 (0.0002)***
Fertility	1.257 (0.166)***
Constant	18.638 (2.973)***
(standard error in brackets); *p<.1,**p<.05,***p<.01	
N=833; R²=0.7194 [within: 0.4985, between: 0.7365]	
Wald Chi² (5) = 849.25	

Table 2: **The Influence of Social Capital in Per Capita GDP**

Dependent Variable	Whole Sample log(GDPPerCapita)	Developing	S/E Asia/LA
Percentage of children labor	-0.049 (0.005)***	-0.035 (0.005)***	-0.03 (0.024)
measure for openness	3.437 (0.917)***	0.281 (1.445)	2.378 (3.161)
Catholic	0.002 (0.003)	0.012 (0.004)***	0.003 (0.006)
Other Christian	0.007 (0.004)*	0.016 (0.008)**	0.031 (0.019)
Muslim	-0.003 (0.003)	0.007 (0.004)*	0.00 (0.007)
Jewish	0.758 (0.199)***	-0.131 (0.580)	0.208 (0.883)
Hindu	0.005 (0.009)	0.025 (0.009)***	0.00 (0.036)
Buddhist	0.013 (0.005)**	0.016 (0.005)***	0.015 (0.008)*
Measure for political instability	-0.819 (0.233)***	-0.395 (0.271)	-1.167 (0.663)*
women in gov [%]	0.01 (0.006)*	-0.008 (0.009)	0.001 (0.002)
Constant	7.482 (0.341)***	7.227 (0.369)***	7.43 (0.767)***
Observations	68	46	26
R-Squared	0.85	0.79	0.65
(Standard Errors in Brackets)			
*p<.1,**p<.05,***p<.01			

Income Female / Income Male 2003

IncomeF / IncomeM 2003

⬛ (yellow)	0 - 0,2
⬛ (orange)	0,21 - 0,4
⬛ (red)	0,41 - 0,6
⬛ (purple)	0,61 - 0,8
⬛ (blue)	0,81 - 1,0
⬜	No data

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