
EURASIAN JOURNAL OF ECONOMICS AND FINANCE

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GENDER BIAS AND CHILD LABOR: SPAIN, LATIN AMERICA AND DEVELOPING COUNTRIES FROM A LONG-TERM COMPARATIVE PERSPECTIVE^{*}

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Abstract

In this paper, several historical scenarios are compared, each very different to the each other in both institutional and geographical terms. What they have in common is the relative poverty of part of the population. This approach allows combining micro historical analysis (in the Catalan case) with a macro comparative approach in developing countries. Through these micro historical and macro regression analyses we obtain the result that adult women's skills and real wages are a key factor when we wish to explain the patterns of child labor. While female real wages increased sharply in 19th century Catalonia, we obtain very different results in the case of developing countries. This gender bias is identified as one of the very significant effects of human capital which held by women and 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.

Keywords: Child Labor, Women's Work, Human Capital, Fertility, Income Inequality

JEL Codes: J22, J24, J13, J16, O1, N36

1. Introduction: The Human Capital Transition

Working families, on the side of labor supply, and firms' 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, child labor represented a very flexible asset providing stability in an unstable world (Basu and Hoang Ban, 1998). It allowed their parents to confront adverse economic situations caused by the business cycle (like the rise in unemployment in the formal economy) or the family cycle (as was the case when aging parents had to rely on their children as the main source of family income).

On the side of the demand for child labor, in underdeveloped societies, such as 19th century Spain or the developing countries today, firms had (and have) a preference for cheap

^{*} This article was supported by the Ministry of Economy and Competitiveness, project HAR 2012-3952-CO-01; HAR2015-58183-P(MINECO/FEDER) and a Barcelona Graduate School of Economics Seed Grant. The author is also most grateful to Thomas Woiczky and Ana Rodríguez-González for their excellent research assistance.

(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/is the alternative to formal education that factories provide(d) needed to acquire the skills to perform factory or farm work. By means of the apprenticeship system, children learnt the knowhow of industrious factory skills, dexterity and discipline and adaptation to firm hierarchy. On the other hand children, like women, were less conflictive than adult men. In the Catalan context, riots and strikes by trade unions fighting against low wages intensified the use of women and children instead of adult men. This choice came together with the change in the location of the industries themselves that moved from urban ports such as Barcelona (points of arrival of British coal) to rural settings that could make use of the free energy of water and where there were no male trade unions (Camps, 2011; Garcia Balana, 2004; Casanovas, 2004).

While during the 19th century the geography of industry has been considered highly dependent on natural resources and coal, at the beginning of the 20th century the spread of the second technological revolution brought with it increasing demands for 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 many levels of labor productivity.

In underdeveloped societies, the beginnings of the human capital century (Goldin and Katz, 2008) gave rise to several shocks that affected family size and make-up and also the rationale of laboring families. More expensive education and training of children who postponed the age of entry to the labor market affected the family budget and there was a "trade off" between "quantity (i.e., fertility rates) and quality (i.e., levels of education)" of children. Fertility rates decreased 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, in other words, in the new situation fewer children attained higher levels of education. This may have had very clear effects on productivity levels. It was an engine stimulating the growth of per capita GDP as a consequence of human capital accumulation and also a result of lower demographic pressure on economic resources relative to the situation where fertility rates were very high (Camps and Engerman, 2014). The question seeking to answer here is how this process began.

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 tradeoff between the "quantity and quality" of children. In the Spanish case, Baizan, Camps (2007), by means of a longitudinal analysis of the vital events of women from the cohorts of birth 1900-1950, identify that the education level of the mother had a very significant impact on the education level of their children and also on that 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 is that 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 the social and demographic reproduction of the household. Therefore, assuming here that the education level of mothers (rather than the education level of the fathers) affected the education of the children, since they were responsible for bearing and rearing them and also for their education as a complement of school. Clearly, recent developments of the distribution of household tasks between husband and wife who begin to share all experiences from both of the two major sources of work of the household, production (remunerated labor) and reproduction (rearing and educating children) do not apply to the past. This is an empirical result obtained from all censuses or demographic lists available.

Another of the very important results of Baizan and Camps (2007) is that the most significant variable explaining fertility rates was the mother's education. According to the coefficients and levels of statistical significance, this variable is more important than economic

variables commonly used in the literature, such as the difference between urban and rural or sector of employment. The SSS does not provide any information on religious beliefs, which have been identified by Sen (1990) as being very important information to explain women's activity both in economic production and demographic reproduction. But, during most of the period considered in this study, Spain was under a National Catholic political regime and most of the people, as in Latin America, were practicing Catholics.

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

$$F_i = f(H_{m_i}) \quad (1)$$

and

$$H_i = f(H_{m_i}) \quad (2)$$

where F_i are the Fertility rates at year i ; H_i are the number of years spent at school by children at year i ; and H_{m_i} 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 do not improve and therefore demographic growth is a function only of the evolution of the fertility rate, even if this hypothesis, as we will see, does not apply to the developing world of the 20th century.

$$Y_i = f(K_i, L_i, T_i, H_i, P_i) \quad (3)$$

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 rates, the growth of the labor force depends on increased fertility rates:

$$P_i = F_i \quad (4)$$

and

$$L_i = L_0 (1 + F_i) \quad (5)$$

From what our assumptions in (1), (2) (4) and (5) we can reformulate (3) as follows:

$$Y_i = f(K_i, H_{m_i}, L_0, T_0) \quad (6)$$

where L_0 (labor at the starting point) and T_0 (land) are constants. Therefore we assume in the model arising 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 among adult women while labor and land are constant.

3. The Data

Conclusions for Spain taken from the Socio Demographic Survey of 1991 and data on female real wages and fertility are published by Camps (1995), Casanovas (2004) and Cabré (1999). The data used for international comparisons are taken from several data sources. Data on women's and child labor, infant mortality and life expectancy can be found in World Bank datasets. Data on females' income, the gender gap and women's empowerment are taken from the United Nations (2005): Human Development Report. Data on religious beliefs and ethnic diversity are taken from the dataset on economic fractionalization by Alesina *et al.* (2003). Data

on income inequality are taken from Klaus Deininger and Squire (1996): A New Data Set Measuring Income Inequality”, World Bank Economic Review, 10:3. Data on per capita GDP are taken from the World Penn Tables and data on education from Barro and Lee (2013).

4. The Historical Evidence from Catalonia as a Spanish Case Study

During the first third of the 20th century, and contemporary with 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 the Catalan population rose from 24 per cent to 82 per cent and the educational gender gap (calculated as the difference between illiteracy among women and men) fell from 28 to 12 per cent for the same dates. Together with this set of events women’s real wages in the textile mills more than doubled in the same period (see Figure 1).

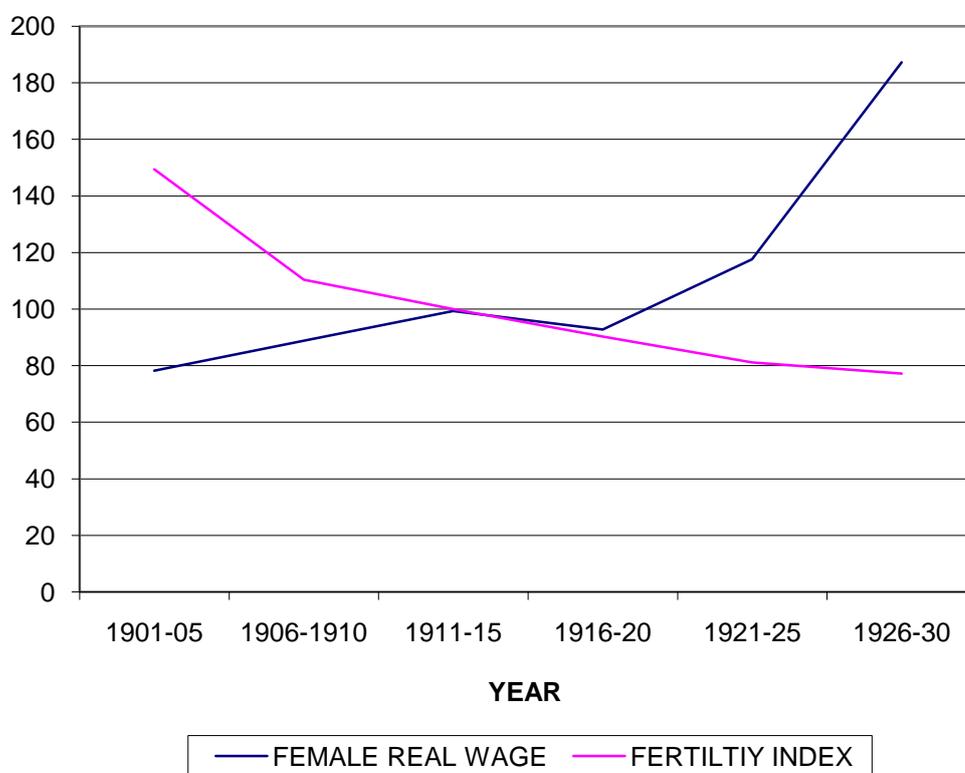


Figure 1. Women’s real wages and fertility evolution: the Catalan case, 1900-1935
 Source: Baizan and Camps, 2007

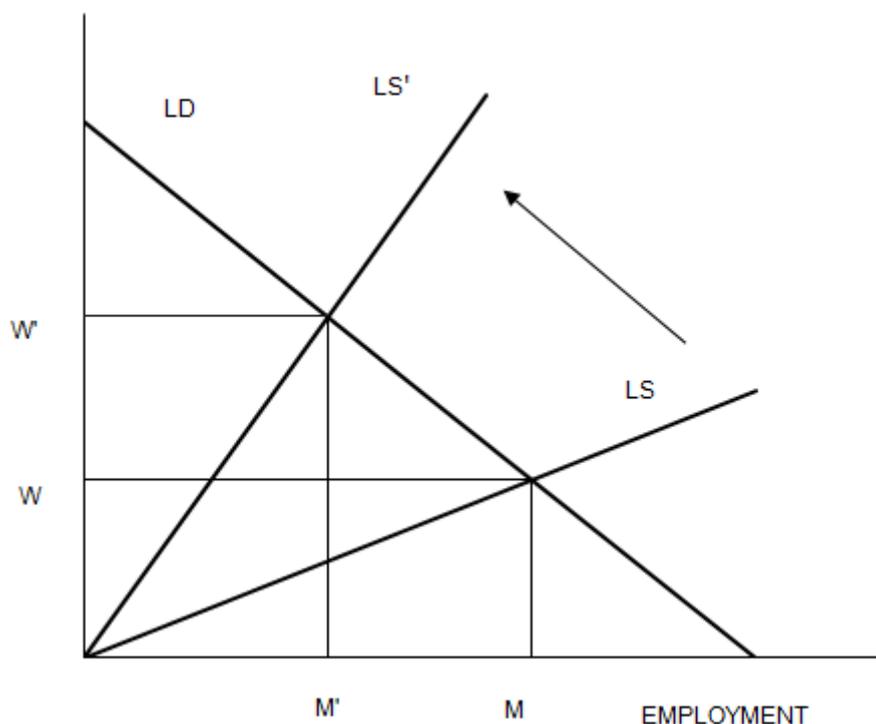


Figure 2. The human capital transition and labor market dynamics

Source: Baizan and Camps, 2007

According to Casanovas (2004) female human capital was acquired at trade schools (Escola Industrial) that offered vocational training specially adapted to the Catalan textile mills, which moved from towns to the countryside to use the free energy provided by water and avoid labor conflicts caused by anarchist trade unions. Between 1920 and 1930 women's hourly wages increased by 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 labor demands. The consequence of this was the sharp reduction in fertility which attained its minimum of 1.9 (below replacement) as early as in the 1930s (legitimate fertility of women of the 1910-1914 birth cohort (Cabr , 1999)) –see figure 1 and 2-. As already mentioned, the improvement of the education of mothers following the model of Baizan and Camps (2007) was instrumental in improving the education levels of their children. But this was not the only effect. The significant improvement in women's real wages gave the family some of the financial bases to remove children from the labor force. As stated above, this 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 mothers' education levels on child labor, education, and fertility and therefore on human capital formation. What is not so clear is the role of this education on improvements in economic growth. According to all estimations, the Spanish economy only began to grow vibrantly after 1960. The main reason that explains why Spain did not significantly grow before is the social conflicts of this period. The opposing and conflicting interests between landowners and owners in general, the clergy and religious institutions, old policy makers and the army among other social groups and the new enlightened and educated working class, liberal professionals, new educative institutions brought in by the republican governments and new republican politicians led to 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 to the 1960s caused a regression in economic growth measured by per capita GDP (Prados de la Escosura and Ros s, 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 Child Labor in Current Developing Countries

One of the most positive consequences of the second era of globalization since the 1970s to the present has been the improvement of the human capital stock of poor countries, particularly in Latin America and South and East Asia (see Camps and Engerman, 2014). Many authors committed to world economic development have dealt with these transformations that are more visible if we search the results in variables that affect the quality of life rather than in variables related to wealth and income. When wishing to understand the origins of this current transformation, as opposed to the model we built when 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 tendency to diverge at country level increased during the first part of the 20th century (Sala-i-Martin, 2006). In contrast the second era of globalization places us in a new context in which a new trend towards convergence started (Sala-i-Martin, 2006). However, it is important to stress the fact that some of the outcomes of economic openness during the second era of globalization have had a clearer effect on human capital spheres of ordinary people’s lives including health and life expectancy, infant mortality, scientific knowledge, educational infrastructure and services, more than levels of wealth and income (Camps and Engerman, 2014)

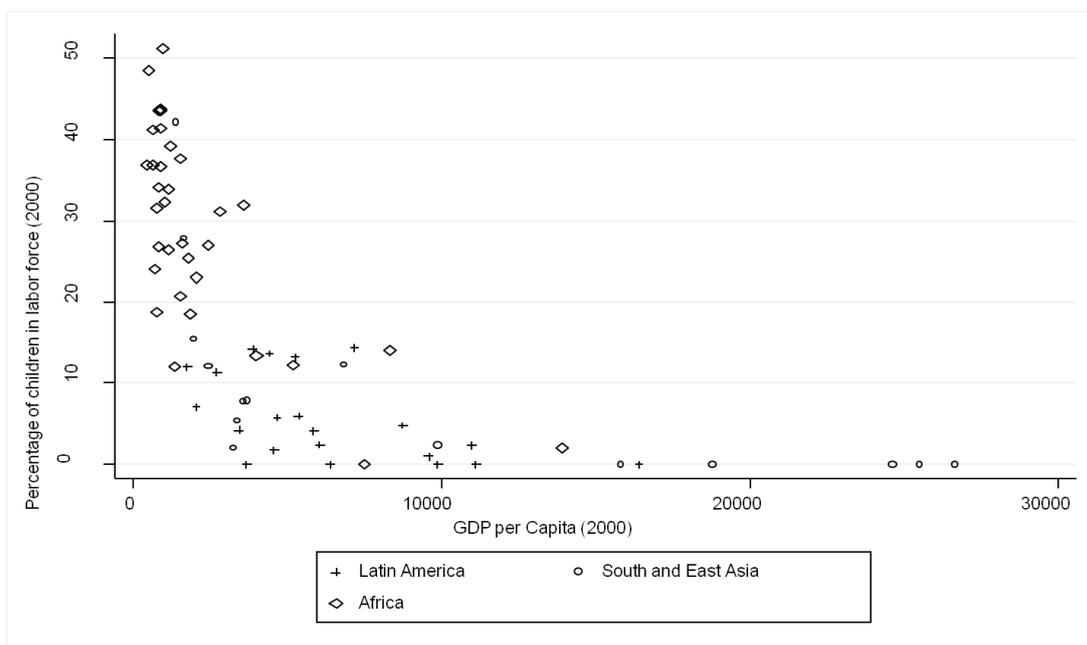


Figure 3. Child Labor and GDP per Capita in the Developing World
 Source: World Bank (2005), The Center for International Data (2005)

One of the better explored aspects of these achievements has been the improvement in life expectancy (Becker, 2005) and infant mortality (Bloom and Williamson, 1998) (See Figure 4). In the years 1960-2000 in many poor countries this transformation was outstanding indeed and this is the reason why the world population grew 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 conducted in the first part of the paper).

In poor countries today, just 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 (see Figures 3 and 5).

It is possible, using the time budgets built by the Human Development Report (2003) of current poor countries, to report that the number of hours women can allocate to paid production per day is lower than or equal to 4 while domestic chores require between 6 and 7 hours' dedication 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 for women's time to perform 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 that show the highest levels within the country of inequality of income distribution (see Figures 6 and 7)

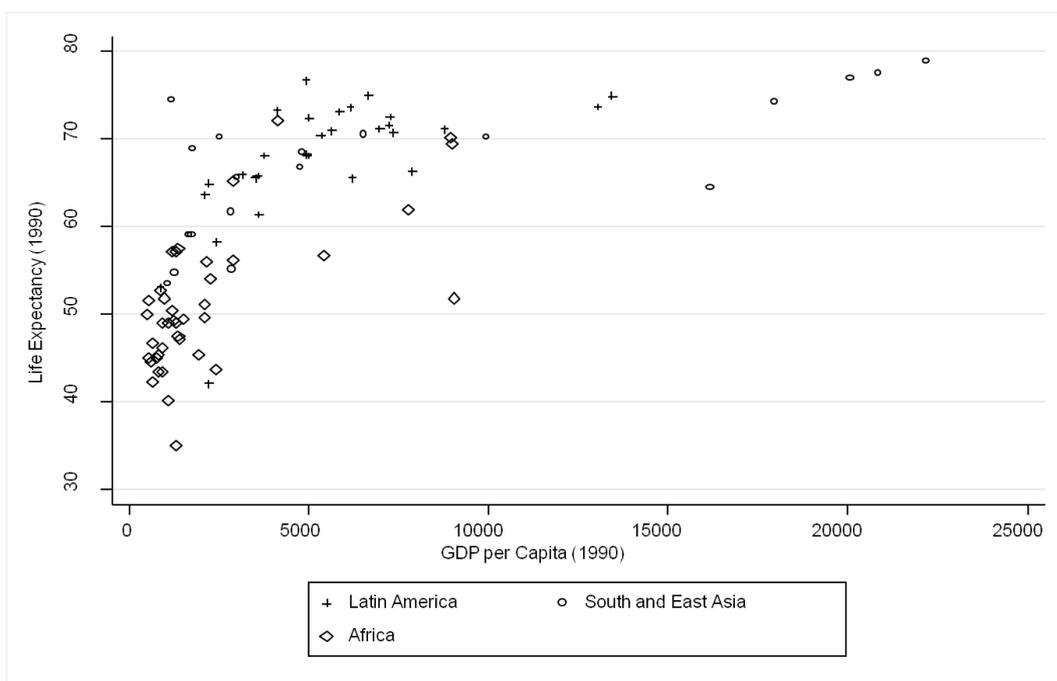


Figure 4. Life Expectancy and GDP, Developing World

Sources: World Bank (2005), The Center for International Data (2005)

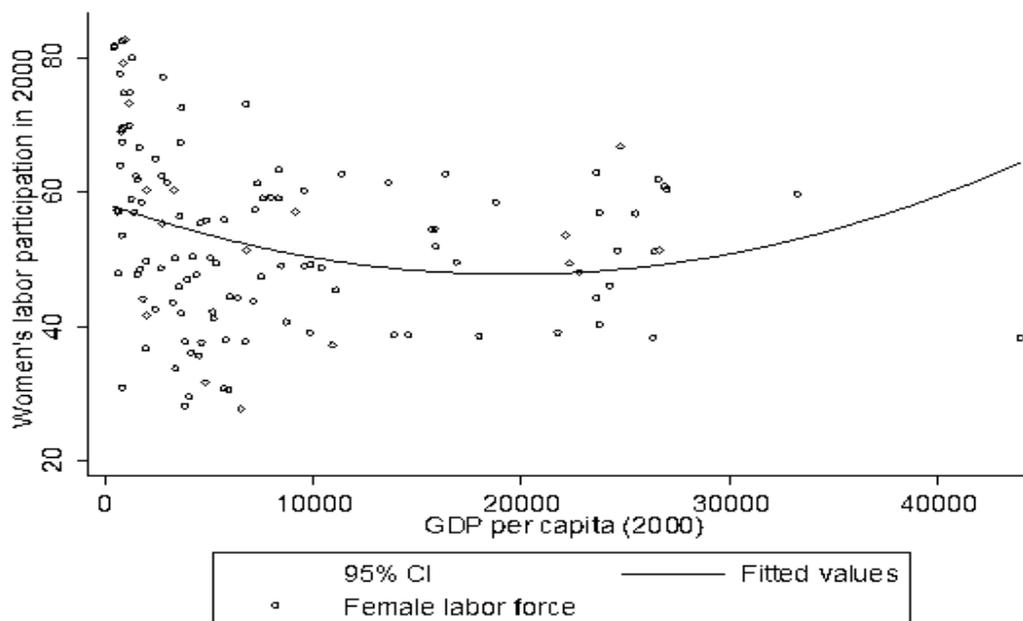


Figure 5. The U-shaped Female Labor Participation Function in Development Worldwide Sample, 2000

Sources: United Nations (2005) and The Center for International Data (2005)

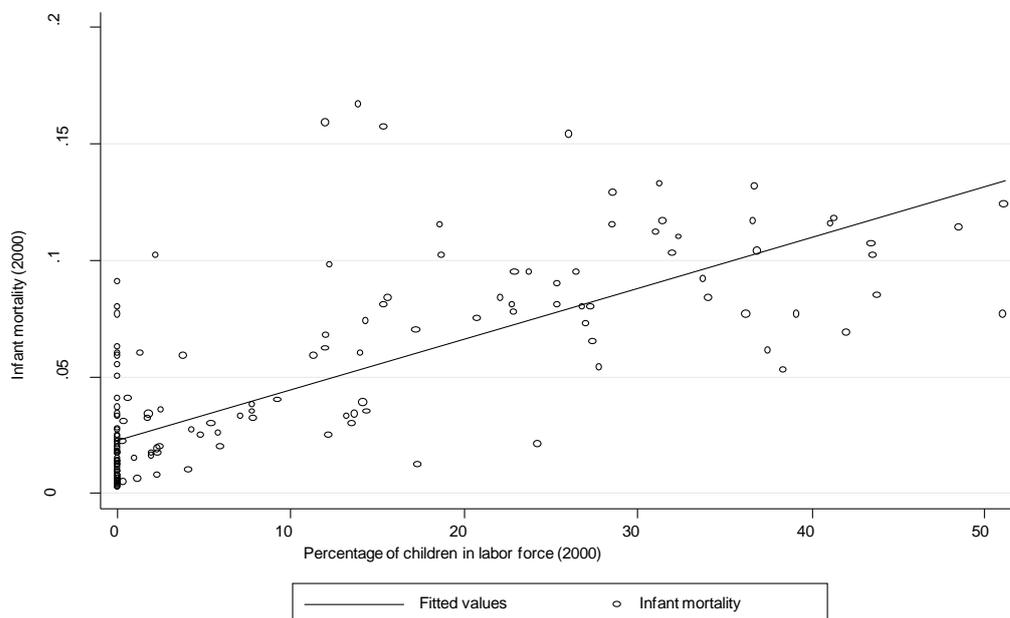


Figure 6. The Influence of Children's Work on Infant Mortality Worldwide Sample, 2000

Sources: World Bank (2005)

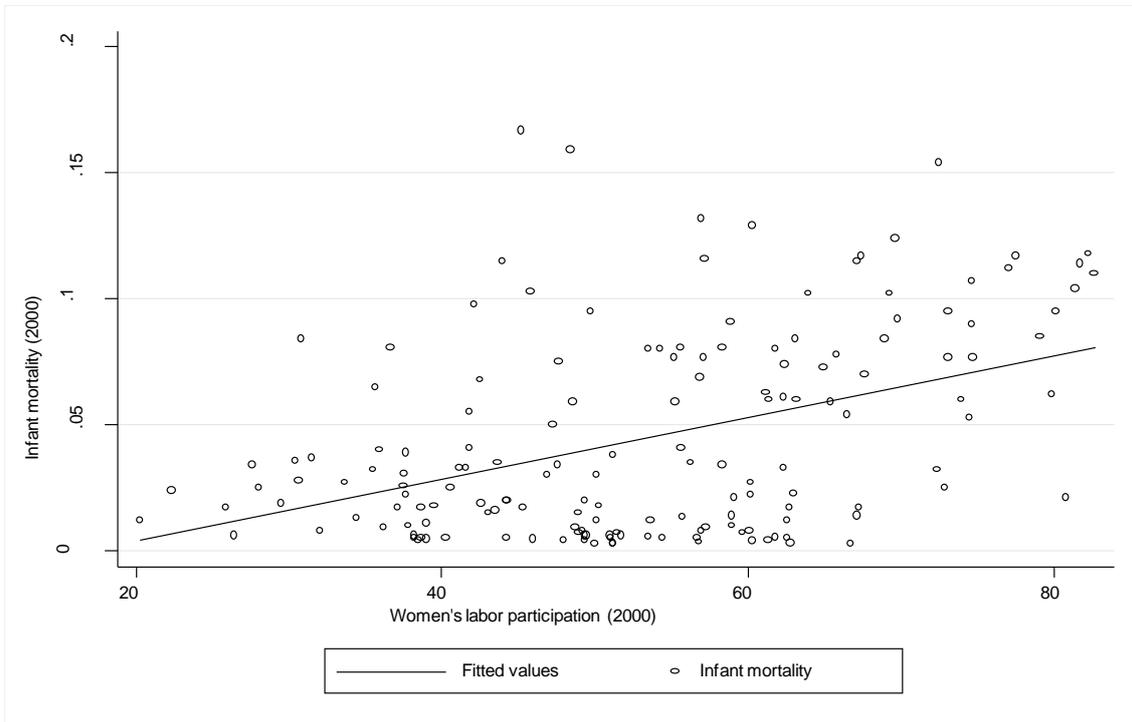


Figure 7. The Influence of Female Labor Participation in Infant Mortality Worldwide Sample, 2000
Source: World Bank (2005)

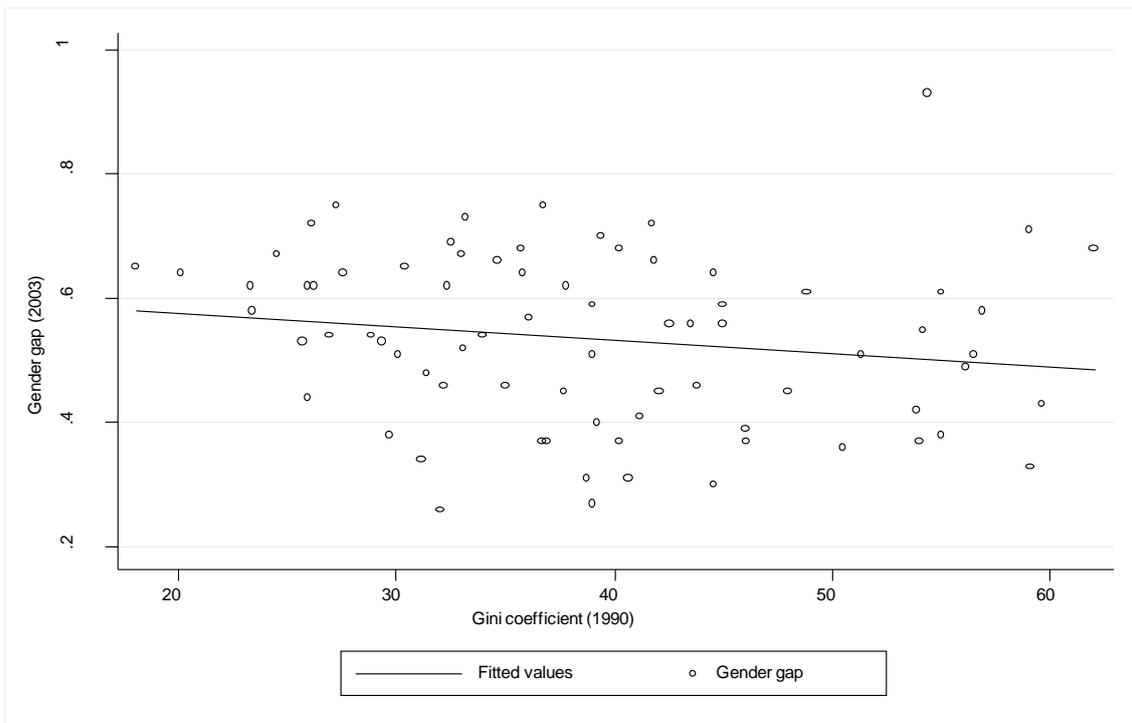


Figure 8. The Relationship between the Gender Gap (Income Female/Income Male) and Economic Inequality
Sources: Deininger and Squire (1996), United Nations (2005)

In Figure 8, we plot the Gini coefficients of income distribution by Deininger and Squire (1996) for years 1990-1995 and their relation with the gender gap and we obtain a slightly negative correlation. The effect of the Gini coefficients of income inequality of the economy on the gender gap is nearly constant (Figure 8). On the other hand, the relationship between Gini coefficients and children's participation in the labor force is positive and, if we exclude countries where children do not work, U shaped (See Figure 9). Child labor is more intense in very unequal countries and in countries that are too poor to exhibit very high Gini coefficients. Several authors have stressed that economic inequality achieves lower values in open economies and in countries where women are more visible in public and professional decision making (women's empowerment). All these events occur more easily in egalitarian societies than in extremely unequal ones where most women have little access to human capital services for themselves and for their children.

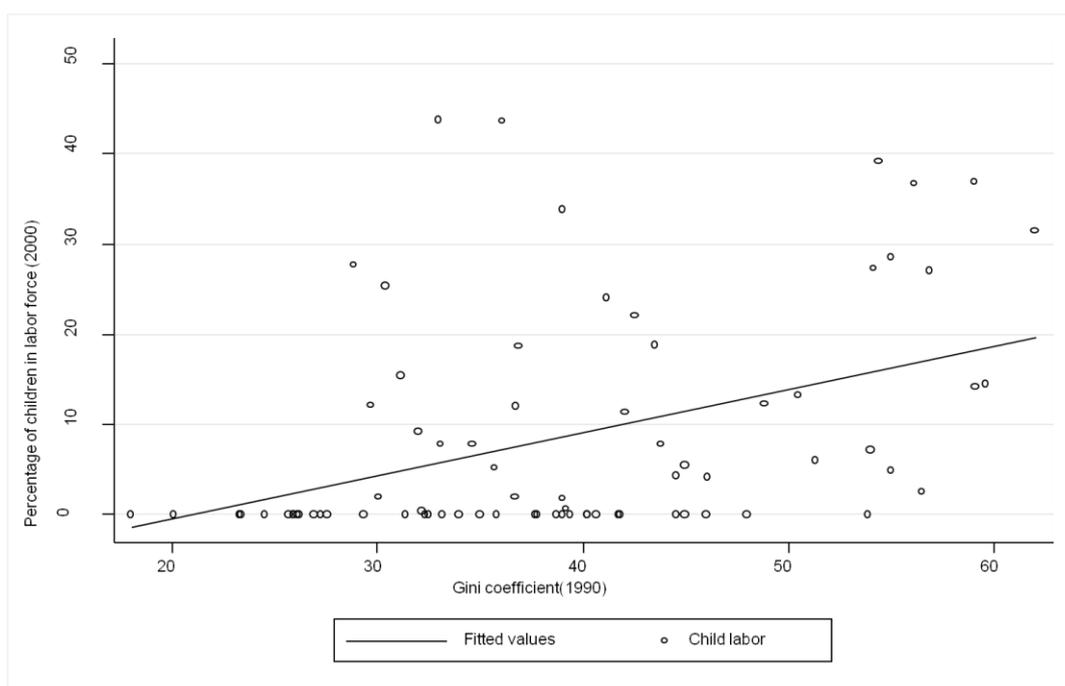


Figure 9. The Relationship between Children's Work and Economic Inequality
Sources: Deininger and Squire (1996), World Bank (2005)

The results from the regression analysis are consistent with the model we set out in part 2 of the paper. In Table 1, we see that child labor continues to exist in extremely gendered societies where the human capital of women is very low in absolute and in relative (to men) terms, and fertility rates are high. In Table 1 we can see that the intensity of child labor 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 offers a statistically significant result. On the other hand, the sign of the coefficient of fertility is positive and this implies that the countries with the highest fertility rate in average terms are also those exhibiting the highest rates of child labor. 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 gender bias.

**Table 1. Explaining child labor in developing countries
A cross-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) ^{***}

Notes: (Standard errors in brackets); *p<.1,**p<.05,***p<.01 N=833; R²=0.7194 [within: 0.4985, between: 0.7365] Wald Chi² (5) = 849.25

Source: Barro and Lee (2013), The Center for International Data (2005)

In a comparative framework the poorest countries from Africa are those with the most severe mortality conditions, highest fertility rates (Camps and Engerman, 2014) and also biggest income inequality and gender gap. But it should also be noted 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. Figure 4 also shows that Latin America has a high variance in life expectancies, with results between 50 and 75 years at the end of the 20th century. But in richer countries where gender bias is low and the participation of children in the labor force is also low, both infant mortality and life expectancy have improved. In Tables 1 and 2 we present the evolution of female years of schooling and child participation levels in the labor force in Latin American countries for the period 1960-2000. Notice the increase in the trend of female years of education and the decrease in child levels of labor participation 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, especially the removal of children from the labor force, have stimulated economic growth by means of the improvement of education levels (Reimers, 2006) (see Figures in the Appendix). But, just as in the Spanish case, other economic factors have fostered low levels of economic achievement. After the ISI period, during the 1980s foreign debt payment problems implied serious adjustment measures that sacrificed levels of consumption and investment and economic development in some Latin American countries.

Table 2. The influence of social capital on per capita GDP

Dependent Variable	Whole Sample log (GDP per Capita)	Developing	S/E Asia/LA
Percentage of child 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

Notes: (Standard errors in brackets) *p<.1, **p<.05, ***p<.01

Source: Alesina et al (2003), World Bank (2005)

6. Conclusion

The 20th century has significantly been coined 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 levels of participation by women and children in the labor market in a comparative framework. While in Catalonia and parts of Spain the increase in the levels of education of women and children was a process that began in the 19th century and took place throughout 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). (See Figures in the Appendix) Uneducated mothers with low levels of income had undereducated children that were soon part of the labor force. During the 20th century this process was more intense 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 case of Latin American we have proved the trend towards the improvement of women's and children's labor conditions during the recent past. The increase in the levels of education of women brought with it the decline of participation in the labor market by children (see Figures in the Appendix) 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 research.

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Appendix

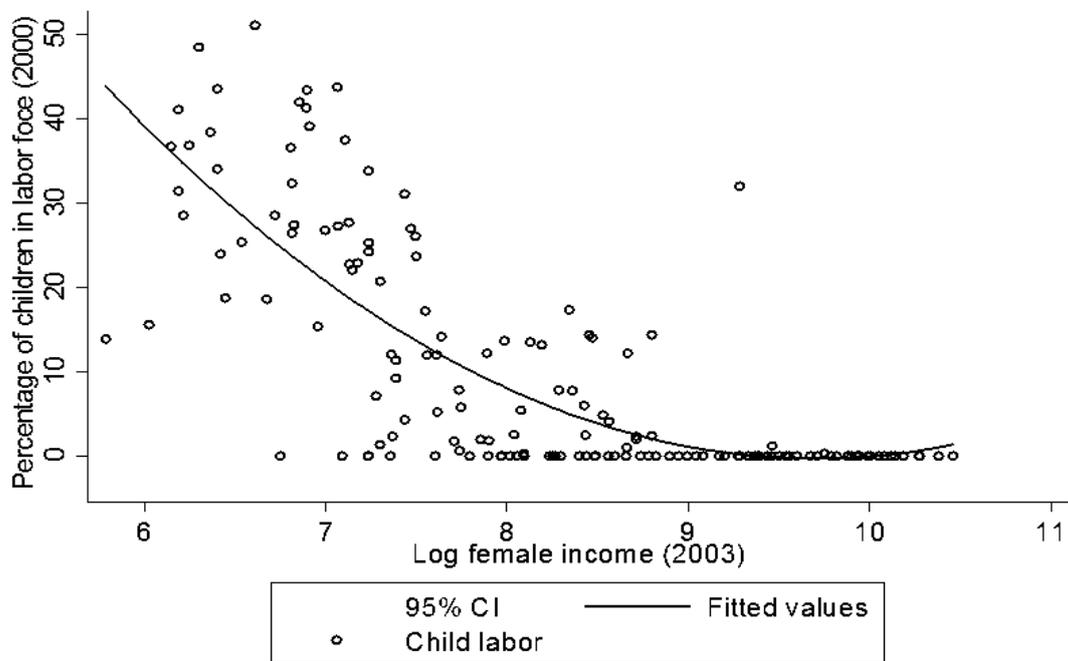


Figure A.1. Children’s work as a function of women’s earnings. Worldwide sample, 2000-2003

Source: UN (2005), World Bank (2005)

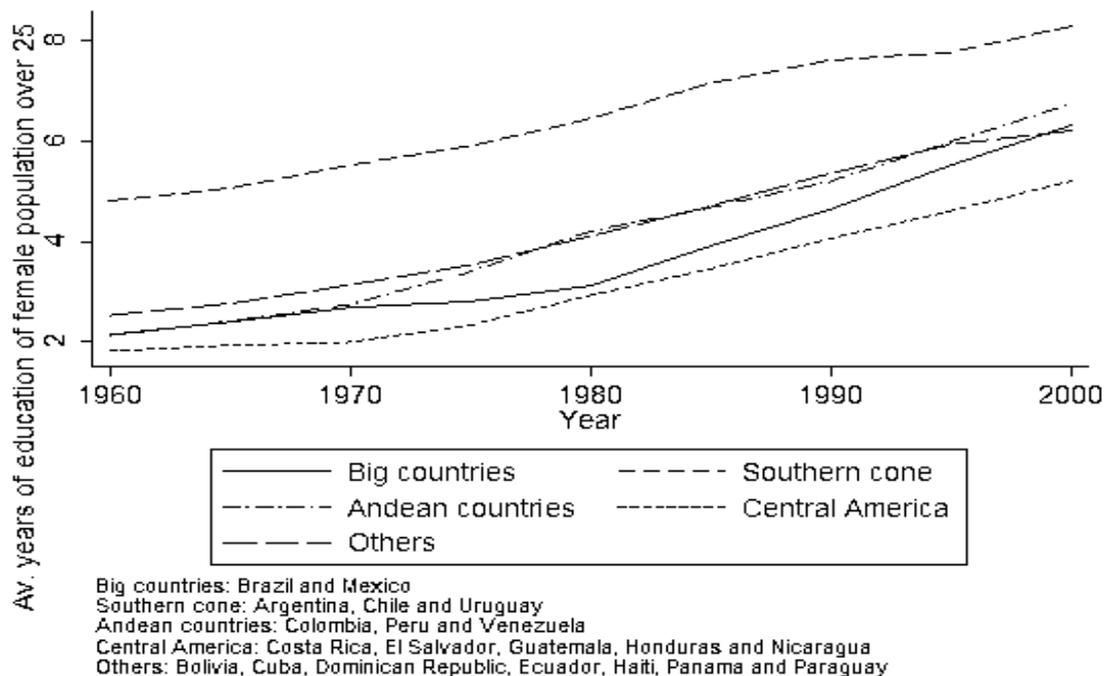
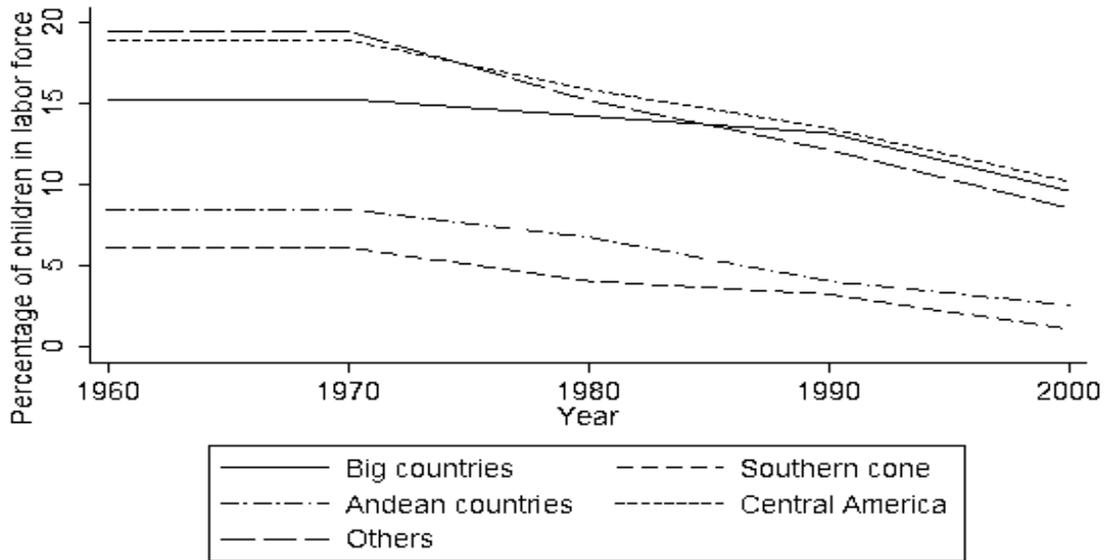


Figure A.2. Women and education, Latin America, 1960-2000

Source: Barro and Lee (2013)



Big countries: Brazil and Mexico
 Southern cone: Argentina, Chile and Uruguay
 Andean countries: Colombia, Peru and Venezuela
 Central America: Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua
 Others: Bolivia, Cuba, Dominican Republic, Ecuador, Haiti, Panama and Paraguay

Figure A.3. Child labor, Latin America, 1960-2000
 Source: World Bank (2005)

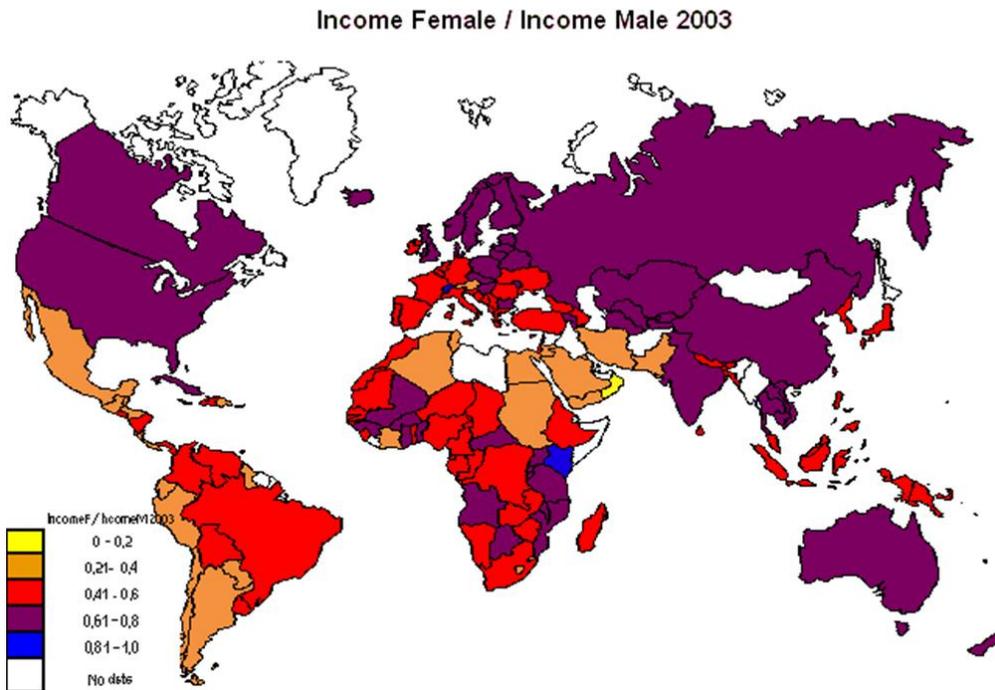


Figure A.4. Income Female/Income Male, 2003
 Source: UN (2005)