Globalisation, gender and child work

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This paper evaluates the impact of globalisation on two sorts of child work: child labour and household chores. Using newly available survey data on gender-specific participation rates in child labour and household chores, I estimate results separately for boys and girls to determine whether globalisation affects the activities of these children differently. I find a negative and robust impact of FDI and trade openness on child labour, but no evidence that this relationship varies by gender. I also find FDI inflows to be correlated with lower participation by children in household chores, even after controlling for endogeneity.

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1. Introduction

The existing child labour literature overwhelmingly finds a negative relationship between child labour and various measures of economic globalisation, namely, trade openness and foreign direct investment (FDI).[1] These results give rise to new questions over how, if at all, the effect of globalisation on child work varies for different groups of children, in particular boys and girls. A thorough analysis of the gender component of child labour would, however, be incomplete without acknowledging the differences that exist in the types of activities typically undertaken by boy and girl children. Until recently, existing child labour data were not gender specific, and failed to differentiate between the 'economic' and 'noneconomic' activities of children—an important distinction, particularly in the context of gender.

A child's labour activities are classified as 'economic' if he or she works for pay (in cash or in kind) outside the home. This type of employment is also referred to as market-based work or child labour. 'Noneconomic' activities are by definition unpaid work, typically chores performed within the child's own home. The types of activities that fall under the umbrella of household chores include cooking, cleaning, fetching firewood and water, and providing childcare for siblings. Household chores are often viewed as less harmful or damaging than market-based work but, as argued by Edmonds (2008), that is not necessarily the case. The rigour and duration of chores is often just as demanding as paid work. Micro studies in Peru, Mexico and Egypt have found household chores to be at least as likely as child labour to interfere with a child's schooling (Levison and Moe, 1998; Levison et al., 2001; Assaad et al., 2003). This is an important result, because one of the greatest concerns surrounding child labour is that it interferes with education and the accumulation of human capital.

As the quality and availability of child labour data increases, a clearer picture of these types of activities and how they vary by gender has emerged. For example, we now know that female children are 18 per cent more likely to participate in domestic chores, and male children are up to 30 per cent more likely to be employed in paid market work (Edmonds, 2008). Further, girls are significantly more likely to participate in labour and chores concurrently and tend to work longer hours than boys (Edmonds and Pavcnik, 2005). These facts lend weight to the assumption that an influx of international trade or foreign investment might affect boys differently from girls.

This paper presents an empirical analysis of the gender component of the impact of globalisation on both the economic and noneconomic activities of children. In line with the existing literature, I find a negative correlation between globalisation and child labour (economic activities) when globalisation is measured using FDI and trade openness and both variables together. I also find a negative correlation between FDI and participation in household chores. These correlations may be the result of an income effect as the significance of each globalisation coefficient disappears with the inclusion of per capita income. These relationships are robust to endogeneity corrections using two-stage least squares. Interestingly, I find no evidence that the impact of globalisation, whether measured by FDI or trade openness, varies by gender.

2. Theoretical framework

2.1. Economic activity

Basu and Van (1998) argue that households send their children to work not out of greed but out of necessity. Once family income exceeds some subsistence threshold the child's contribution to income will no longer be required to feed and clothe the family and he or she

will subsequently stop working. This theory is supported by the empirical finding of Edmonds and Pavcnik (2006) of an income effect in the impact of trade openness on child labour and by Davies and Voy (2009) who find a similar income effect with FDI. The Basu and Van subsistence theory suggests that, theoretically, there would be no significant gender difference in the effect of trade liberalisation on child labour if households sent their children to work solely for subsistence. Once household income exceeds this threshold the family withdraws its children from work, regardless of gender.

It is possible that, in families with multiple children, household income will surpass the subsistence threshold, allowing some but not all of the children to stop working. If this is the case and there are gender biases that lead households to be more inclined to withdraw a child of one sex from the labour market before the other, then the potential exists for a small gender differential. For example, if boys can earn a higher market wage than girls, perhaps in jobs where their relative strength is an advantage, households may pull female children from labour markets first.[2] On the other hand, there are a number of complexities stemming from deeply rooted cultural and religious beliefs and biases about gender roles that might have an impact on household decisions. For example, in Mexico, Reggio (2011) finds that increases in mothers' bargaining power within the household leads to fewer hours of labour for her female children, but not for male children. Conversely, if households perceive the return on education to be higher for males than females, then in response to a rise in income, they may be more likely to enrol their boys in school while the female children continue to work.

2.2. Noneconomic activity

The impact of globalisation on household chores (if any) would be through a different mechanism from that on child labour. First, chores are non-tradable, so it is not immediately

obvious that trade liberalisation would have an impact on noneconomic activities at all. Further, since household chores are by definition unpaid, a child's participation in these activities might not be expected to be affected by an income effect arising from trade. However, to the extent that a child's participation in household chores allows his or her parents to work, an income effect of FDI or trade may have an impact on noneconomic activities such as domestic chores. If globalisation increases per capita income—as documented by Irwin and Tervio (2002) for trade and Feenstra and Hanson (1997) for FDI—a household may decrease its reliance on the domestic support provided by children either by decreasing the parents' hours of employment or by hiring outside help (for example, child care providers). Levison and Moe (1998) find evidence of an income effect on chores in Peru, where family income is negatively correlated with adolescent girls' participation in household chores.

Whether the overall impact on chores is different for boys and girls depends on several factors, similar to those for child labour. These factors include perceived or real productivity differences, the opportunity cost of the child's time (How much could the child make if he or she were working? What are the returns to education? Is this different for boys and girls?), and cultural and religious beliefs about gender.

3. Methodology and data

A regression of child work (both economic and noneconomic activities) on measures of economic global integration (net FDI inflows, trade openness and both variables together) will measure the correlation between globalisation and child work. Consider the following baseline equation:

$$child\ \ work_i = \beta_0 + \beta_1 globalisation_i + \beta_2 \ln\left(population_i\right) + \boldsymbol{\alpha}\mathbf{Y} + \varepsilon_i \qquad (1)$$

Child work will be quantified using two datasets: economic activity (which has traditionally been referred to as 'child labour') and noneconomic activity (domestic chores performed within the child's own home). The log of population is included to control for variations in country size and **Y** is a vector of year dummy variables. The coefficient estimates for β_1 measure the effect of globalisation on child work. Equation (1)—the baseline equation—is estimated separately for male and female children and the respective parameter estimates are compared using a standard F test to determine whether the values are statistically different from each other, indicating whether the impact of globalisation on child work is different for girls and boys.

Following a similar framework to Davies and Voy (2009), I add per capita income to the baseline equation to investigate whether the gender-specific impact of globalisation on child work is channelled through income as previously documented:

$$child\ \ work_i = \beta_0 + \beta_1 globalisation_i + \beta_2 \ln\left(income_i\right) + \beta_3 \ln\left(population_i\right) + \boldsymbol{\alpha}\mathbf{Y} + \varepsilon_i \qquad (2)$$

Endogeneity of globalisation and income is a concern as it is reasonable to assume that participation rates in child labour and chores might have an impact on levels of FDI, international trade and potentially GDP. I address these concerns using instrumental variables and two stage least squares. A description of the instruments can be found in Section 3.2.

3.1. Data

Table 1 presents the descriptive statistics of the variables used herein. The child work data are from the ILO's Statistical Information and Monitoring Programme on Child Labour (SIMPOC) and UNICEF's Multiple Indicator Cluster Survey (MICS). These datasets,

compiled by the World Development Indicators (2011) for child labour and the Understanding Children's Work Project (2010) for chores, are collected from household surveys conducted domestically. Because the surveys are commissioned independently, the years and frequency of collection vary. For many countries, particularly the lowest-income countries where child labour is of gravest concern, only one study has been completed in the past 15 years. On the other hand, there are a number of countries for which detailed child labour data are collected with relative frequency. In the event that a country has completed multiple surveys yielding more than one year of observations, the additional data are included.[3] Countries included in each dataset and years/frequency of collection are presented in Appendix A.

[Insert Table 1 about here]

The child labour (economic activity) data make up an unbalanced panel of 82 countries with between one and three years of data, yielding 133 observations for each sex. The sample for household chores represents 75 countries with between one and six years of data, yielding 103 observations per sex. Both the child labour and chores variables represent the percentage of children of gender *g* in the designated age range (7-14 years for child labour and 5-14 years for chores), participating in the qualifying activity in country *i*. For example, suppose there are 2,000,000 boys between 5-14 years of age in country *j*. If 500,000 of those boys report having participated in household chores during the previous week then *child work* is 25. The types of noneconomic activities that are considered 'household' or 'domestic chores' include cooking, cleaning, fetching water or firewood and looking after younger siblings within the child's own home. [4] If these activities are performed by the child in another family's home for pay, the work is considered 'economic activity' and would fall under the category of child labour.

FDI data are from the World Development Indicators (2011) and are measured as the log value of net investment inflows in constant 2000 U.S. dollars. [5] Household income, measured as the log of per capita GDP in constant 2000 U.S. dollars, and population data also come from the World Development Indicators (2011). Population is included to control for variations in country size. Alternatively, GDP could be included to control for country size, but since logged GDP per capita is used to measure income, I use population to reduce multicollinearity.[6] Finally, trade openness, the sum of exports and imports as a proportion of GDP, comes from the Penn World Table version 7.0 (Heston et al 2011).

Figures 1 through 4 present scatter plots of the correlation between measures of child work and globalisation. Approximate gender differentials can be observed as country codes and fitted lines representing girls' participation rates are labelled in light grey while labels and lines for boys are in darker grey. A strong negative correlation is noted between FDI and both child labour and household chores as seen in Figures 1 and 3, respectively. The relationship between child work and trade openness is less obvious. Figure 2 reveals a weak negative correlation between child labour and trade openness, but in Figure 4, the correlation between chores and openness is slightly positive. The slopes of the fitted lines differ for boys and girls in each of the four comparisons, thus the question of whether these differences are significant is justified. Burundi (labelled by its country code, BDI) is a bit of an anomaly as it has relatively low participation in child labour and low FDI, but high participation in household chores. If Burundi is excluded from the sample, an even stronger negative correlation between FDI and child labour, represented by the slope of the fitted line, would materialise in Figure 1. In general, child labour participation rates are higher for boys while chore participation rates are higher for girls.

[Insert Figures 1-4 about here]

3.2. Description of Instruments

A potential concern is that FDI, trade openness and per capita income are endogenous to child labour. These concerns were addressed using instrumental variables by Edmonds and Pavcnik (2006) for trade and income, and by Davies and Voy (2009) for FDI, trade and income. To ensure the results of this study are not driven by endogeneity, I use two-stage least squares instrumental variables for FDI, trade openness and income. Since bilateral trade and FDI flow data are unavailable for this sample of developing countries, I am unable to duplicate the Edmonds and Pavcnik (2006) geography-based trade instrument first introduced by Frankel and Romer (1999) and Frankel and Rose (2002). In its place, I create instruments for FDI and openness following the modified gravity model for FDI used by Davies and Voy (2009). The key to these instruments is the assumption that geography-based FDI and trade should be uncorrelated with child work, except through its direct impact on the regressand.

The instruments are created by regressing each globalisation variable (FDI and openness) on a set of geographic determinants including *latitude*, the percentage of the population living in *rural* areas, the log of total *area* in square kilometres, an index of political *freedom* (Freedom House, 2006), and two constructed variables that measure a country's geographical attractiveness to FDI and trade. The first of these, *market proximity*, is the sum of real GDP (in millions) for all countries $j \neq i$ weighted by the distance in kilometres between countries j and i. This variable was found to be a significant predictor of FDI by Blonigen et al. (2007). The distances used to calculate *market proximity* are estimated using the great circle distance formula and measure the distance in kilometres between each country's most populous city. *Colonial link* is the unweighted sum of the log of real GDP for all countries with which

country *i* has at any point had a colonial tie. Colonial, distance, area and latitude figures come from the CEPII website.[7] GDP and *rural* data are from the World Development Indicators (2011). Since I employ the one-year-lagged value of FDI and trade openness, the variables used to construct these instruments are also lagged one year behind the corresponding child work data. The FDI instrument equation, with robust standard errors in parentheses, is as follows:

$$\ln\left(FDI_i\right) = \underset{(2.95)}{16.57} + \underset{(0.011)}{0.020}\, latitude_i - \underset{(0.008)}{0.033}\, rural_i + \underset{(0.009)}{0.020}\sum_{j\neq i}\left(\frac{GDP_j}{distance_{ij}}\right)$$

$$+ \underset{(0.175)}{0.646}\ln(area_i) - \underset{(0.113)}{0.107}\ freedom_i - \underset{(0.005)}{0.005}\sum_{j\neq i}\left[colony_{ij} * \ln\left(GDP_j\right)\right]$$

This instrument is generated by predicting the value of the dependent variable. FDI and its instrument have a correlation coefficient of 0.66.

Similarly, an instrument for trade openness is created using the same geography-based determinants. The trade instrument equation is as follows:

$$openness_i = \underset{(27.37)}{160.97} + \underset{(0.20)}{0.93}\, latitude_i - \underset{(0.13)}{0.19}\, rural_i - \underset{(0.07)}{0.05}\sum_{j\neq i}\left(\frac{GDP_j}{distance_{ij}}\right)$$

$$- \underset{(1.80)}{7.71}\ln(area_i) + \underset{(1.81)}{1.35}\ freedom_i - \underset{(0.07)}{0.30}\sum_{j\neq i}\left[colony_{ij} * \ln\left(GDP_j\right)\right]$$

Again, the predicted value of the regressand is used as the openness instrument. The correlation between trade openness and the constructed trade instrument is 0.50.

Endogeneity of income is also addressed using two-stage least squares. Following Edmonds and Pavcnik (2006), I use 15-year-lagged values of per capita GDP as an instrument for income.[8] The F-statistics on excluded instruments (most of which exceed 10) and Shea

(1997) partial R^2 on excluded instruments from the first-stage regressions (FDI instrument, openness instrument and lagged income) are provided for evaluation of instrument strength.

4. Empirical results

4.1. Economic activity

Table 2 presents the results from estimating the child labour model. Results reported in column (1) represent negative and highly significant correlations between FDI and child labour for both male and female children. I do not find evidence that the impact varies by gender—the F-statistic on the comparison of the FDI coefficients is only 0.03. In column (2) per capita income is added to the baseline equation resulting in a loss of significance on the FDI coefficients for both girls and boys. The significance of the income coefficients suggest, as is documented in the existing literature, the presence of an income effect in the relationship between FDI and child labour. This result, coupled with the insignificant F-statistic comparing the income coefficients between boys and girls, is consistent with the Basu and Van (1998) subsistence income threshold: households send their children to work out of necessity and once income exceeds this threshold they respond by withdrawing children from market-based labour activities, regardless of the child's gender.

Endogeneity of FDI and income is a potential concern as it is reasonable to believe that the level of child labour in a country might affect FDI inflows and GDP. Without addressing endogeneity I cannot be certain that the coefficient estimates in columns (1) and (2) are not biased by reverse causation. These concerns are addressed in columns (3) and (4) using the methods of instrumental variables and two-stage least squares discussed in the previous section. Similar to Davies and Voy (2009), I find that the endogeneity bias of FDI is upward, that is, controlling for endogeneity yields a larger negative (and still significant) impact of FDI on child labour. Income is also apparently biased upward by endogeneity, as the

magnitude of the two-stage least squares coefficients for income increases in absolute value from the original specification.

[Insert Table 2 about here]

Table 3 presents the results from the trade openness regressions. The effect of openness on child labour for both boys and girls is negative and significant, as expected. Interestingly, the trade openness coefficient remains significant even after the inclusion of income, suggesting openness to trade may reduce child labour through another mechanism in addition to an income effect. Using the income instrument and the geography-based instrument for trade, endogeneity concerns are addressed in columns (3) and (4). The magnitude of the openness coefficient increases under two-stage least squares; this result is consistent with Edmonds and Pavcnik (2006) and Davies and Voy (2009) which use bilateral trade flows for instrumentation. I find no evidence of a gender differential in the impact of trade on child labour.

[Insert Table 3 about here]

Finally, in Table 4, FDI is added to the trade model to measure whether trade and FDI have independent effects on child labour. Indeed, the inclusion of both measures of globalisation yields significant coefficients for each variable, suggesting that both FDI and trade openness affect child labour. As is found in Table 3, openness (but not FDI) remains significant even after the inclusion of income in the model, a result that is robust to endogeneity corrections.

[Insert Table 4 about here]

4.2. Noneconomic activity

Table 5 displays the results from the empirical estimates where participation in household chores is the dependent variable. Interestingly, FDI has a small but significant impact even on the noneconomic activities of children. Just as with child labour, the impact appears to be channelled through an income effect as the FDI coefficient loses its significance after income is added to the model. That is, inflows of FDI into a country may increase income—as documented by OECD (1995) and Feenstra and Hanson (1997)—perhaps by creating new, higher-paying jobs for adults. If the income surpasses some subsistence threshold, the family may be able to reduce its reliance on the contribution of children to household chores. Take childcare for example. It may be the case that elder siblings are charged with caring for younger siblings while both parents work. If parental income increases, the household may be able to substitute away from sibling-provided child care, either by hiring outside help or by allowing one parent to stay at home to care for the younger children.

As with the child labour specification, endogeneity is addressed using the FDI and income instruments described. The upward endogeneity bias of FDI discussed previously is also supported by the results in column (3) of Table 5. Unfortunately, the use of instrumental variables, particularly the lagged income instrument, substantially reduces the sample size, which may be contributing to the lack of significance of any explanatory variables, notably income, in the IV models presented in column (4). Weakness of instruments is a concern. First-stage F-statistics on excluded instruments are reassuring; however the Shea partial R^2 values indicate room for improvement, particularly for the trade and FDI instruments. As discussed in Section 3.2, the instruments would be markedly improved using bilateral trade and FDI data; however these data are not yet available for the current sample of developing countries.

[Insert Table 5 about here]

Table 6 presents the results from regressions of trade on household chores. A country's openness to trade does not have a significant impact on the noneconomic activities of children, except when per capita income is included in the model, in which case the coefficient for boys is positive, although very small in magnitude. This is an interesting result because it marks the first time a positive relationship is found between trade openness and child work (albeit chores in this model). Nonetheless, the coefficient is rather small, insignificant for girls and only weakly significant for boys.

[Insert Table 6 about here]

Finally, in Table 7, FDI continues to be a significant predictor of chore participation rates even when estimated concurrently with openness and after addressing endogeneity. The same concerns raised above with regard to the income instrument and sample size also apply to the results in column (4). Again, none of the coefficient estimates differ by gender.

[Insert Table 7 about here]

5. Conclusion

FDI and trade openness are negatively correlated with child labour even after controlling for endogeneity. The significance of FDI deteriorates after the inclusion of per capita income in the model. The inverse correlation between trade openness and child labour, on the other hand, remains significant even when income is added to the specification. I find no evidence that the effect of FDI or trade openness on child labour is gender specific.

In addition, I find FDI to be negatively correlated with children's participation rates in household chores. The FDI coefficient is only significant when income is omitted from the equation, a result similar to that found by Davies and Voy (2009) for child labour, which they refer to as an 'income effect'. If FDI inflows increase per capita income, and child leisure is a normal good, then FDI might lesson the burden of chores borne by children. This is an encouraging result, but without several years of observations for each country—data that are currently being collected by the Understanding Children's Work project—it is difficult to establish causation. Still, I find no evidence that either FDI or trade openness increases the incidence of child work in developing countries.

Appendix A

Economic activity dataset (survey years in parentheses)

Albania ALB (2000, 2005), Angola AGO (2001), Argentina ARG (2004), Azerbaijan AZE (2000, 2005), Bangladesh BGD (2003, 2006), Belarus BLR (2005), Benin BEN (2006), Bolivia BOL (2002, 2005, 2008), Bosnia and Herzegovina BIH (2000, 2005, 2006), Brazil BRA (2004, 2007, 2008), Burkina Faso BFA (2004, 2006), Burundi BDI (2000, 2005), Cambodia KHM (2001, 2004), Cameroon CMR (2001, 2007), Central African Republic CAF (2000), Chad TCD (2004), Chile CHL (2003), Colombia COL (2005, 2007), Congo, Dem. Rep. ZAR (2000), Costa Rica CRI (2004), Cote d'Ivoire CIV (2000, 2006), Dominican Republic DOM (2002, 2005), Ecuador ECU (2004, 2006), Egypt EGY (2005), El Salvador SLV (2003, 2007), Ethiopia ETH (2005), Gambia GMB (2000, 2005), Georgia GEO (2006), Ghana GHA (2003, 2006), Guatemala GTM (2003, 2004, 2006), Guinea-Bissau GNB (2000, 2006), Haiti HTI (2005), Honduras HND (2004, 2007), India IND (2000, 2005), Iraq IRQ (2006), Jamaica JAM (2002, 2005), Kazakhstan KAZ (1996, 2006), Kenya KEN (1999, 2000), Kyrgyz Republic KGZ (1998, 2006), Lesotho LSO (2000, 2002), Liberia LBR (2007), Macedonia MKD (2005), Madagascar MDG (2001, 2007), Malawi MWI (2004, 2006), Mali MLI (2005, 2006, 2007), Mexico MEX (2004, 2007, 2009), Moldova MDA (2000), Mongolia MNG (2000, 2005, 2007), Morocco MAR (1999), Mozambique MOZ (1996), Namibia NAM (1999), Nepal NPL (1999), Nicaragua NIC (2001, 2005), Niger NER (2006), Panama PAN (2003, 2008), Paraguay PRY (2005), Peru PER (2000, 2007), Philippines PHL (2001), Portugal PRT (2001), Romania ROM (2000), Rwanda RWA (2000, 2008), Senegal SEN (2005), Serbia SRB (2005), Sierra Leone SLE (2000, 2005, 2007), South Africa ZAF (1999), Sri Lanka LKA (1999), Sudan SDN (2000), Swaziland SWZ (2000), Syrian Arab Republic SYR (2006), Tajikistan TJK (1999, 2005), Tanzania TZA (2001, 2006), Thailand THA (2005), Togo TGO (2006), Trinidad and Tobago TTO (2000), Turkey TUR (1999, 2006), Uganda UGA (2006), Ukraine UKR (2005), Uzbekistan UZB (2003, 2005), Venezuela VEN (2003, 2005, 2006), Vietnam VNM (2006), Zambia ZMB (2005, 2008), Zimbabwe ZWE (1999).

Noneconomic activity dataset (survey years in parentheses)

Albania ALB (2000), Angola AGO (2001), Argentina ARG (2004), Azerbaijan AZE (2000, 2004), Bangladesh BGD (2006), Belarus BLR (2005), Belize BLZ (2001), Bolivia BOL (2001), Bosnia and Herzegovina BIH (2000, 2006), Brazil BRA (2002, 2004, 2005, 2006, 2007, 2008), Burkina Faso BFA (2006), Burundi BDI (2000, 2006), Cambodia KHM (2001), Central African Republic CAF (2000), Chad TCD (2000, 2004), Colombia COL (2000, 2001, 2003, 2005, 2007), Comoros COM (2000), Congo, Dem. Rep. ZAR (2000), Costa Rica CRI (2002), Cote d'Ivoire CIV (2000, 2006), Dominican Republic DOM (2000), Ecuador ECU (2004, 2006), Egypt EGY (2005), El Salvador SLV (2003), Ethiopia ETH (2005), Gambia GMB (2000, 2005), Georgia GEO (2005), Ghana GHA (2006), Guatemala GTM (2000, 2006), Guinea-Bissau GNB (2000, 2006), Guyana GUY (2000), Haiti HTI (2005), Honduras HND (2002), India IND (2005), IRQ Iraq (2006), Jamaica JAM (2002, 2005), Kazakhstan KAZ (2006), Kenya KEN (2000), Kyrgyz Republic KGZ (2006), Lesotho LSO (2000), Liberia LBR (2007), Macedonia MKD (2005), Madagascar MDG (2007), Malawi MWI (2004, 2006), Mali MLI (2001, 2005, 2006), Moldova MDA (2000), Mongolia MNG (2005, 2006), Nepal NPL (1998), Nicaragua NIC (2001), Niger NER (2001, 2006), Panama PAN (2000), Paraguay PRY (2003), Peru PER (2000, 2007), Philippines PHL (2001), Portugal PRT (2001), Rwanda RWA (2000, 2008), Senegal SEN (2000, 2005), Serbia SRB (2005), Sierra Leone SLE (2005), Sri Lanka LKA (1999), Sudan SDN (2000), Swaziland SWZ (2000), Syrian Arab Republic SYR (2006), Tajikistan TJK (2005), Tanzania TZA (1999), Thailand THA (2005), Togo TGO (2006), Trinidad and Tobago TTO (2000), Turkey TUR (2006), Uganda UGA (2000, 2005), Ukraine UKR (2005), Uzbekistan UZB (2006), Vietnam VNM (2006), Zambia ZMB (1999), Zimbabwe ZWE (1999).

Endnotes

[1] See Edmonds (2008) for a survey of the literature.

[2] Child compensation data by gender are scantily available, though some SIMPOC surveys are beginning to collect this information. In the future, it will be useful to know whether a gender wage gap exists for children and whether boys' wages exceeds those of girls (as is typically the case with adult wages).

[3] In unreported results I re-estimate restricting the sample to only one observation (typically the most recently collected) per country. The results are qualitatively unchanged.

[4] There is a grey area between light chores that might be described as, 'a child's responsibility as a member of the family' and excessive chores that interfere with a child's livelihood and ability to attend school. The data used for this study come from household surveys in which the family was asked if the child participated to any degree in household chores within the previous week and thus does not specifically differentiate between casual and potentially excessive participation in household activities. Nonetheless, these survey data provide new insights into a class of child activity that was not previously available. Further, it is reasonable to assume that countries with higher overall participation rates will also have a larger proportion of excess participation.

[5] Note that there were no countries with FDI less than one so no adjustments were made to the variable before logging.

[6] Another alternative would be to normalise FDI such that it is measured as a proportion of GDP (much as openness is measured). Doing so, however, restricts the coefficients on FDI and GDP to be equal but opposite, a result that is rejected by the data. Nonetheless, in unreported results I test the robustness of my results by replacing the current measure of FDI, the log of net FDI inflows, with the ratio of FDI to GDP and the log of FDI stock. Neither of these adaptations has a dramatic impact on the results herein.

[7]Centre d'études prospectives et d'informations internationals: http://www.cepii.fr/anglaisgraph/news/accueilengl.htm.

[8] In addition to lagged income, Edmonds and Pavcnik (2006) also use 15-year-lagged capital investment share of GDP to instrument for income. Lagged investment data are scarce for the sample of countries here, which precluded the inclusion of this variable as an instrument.

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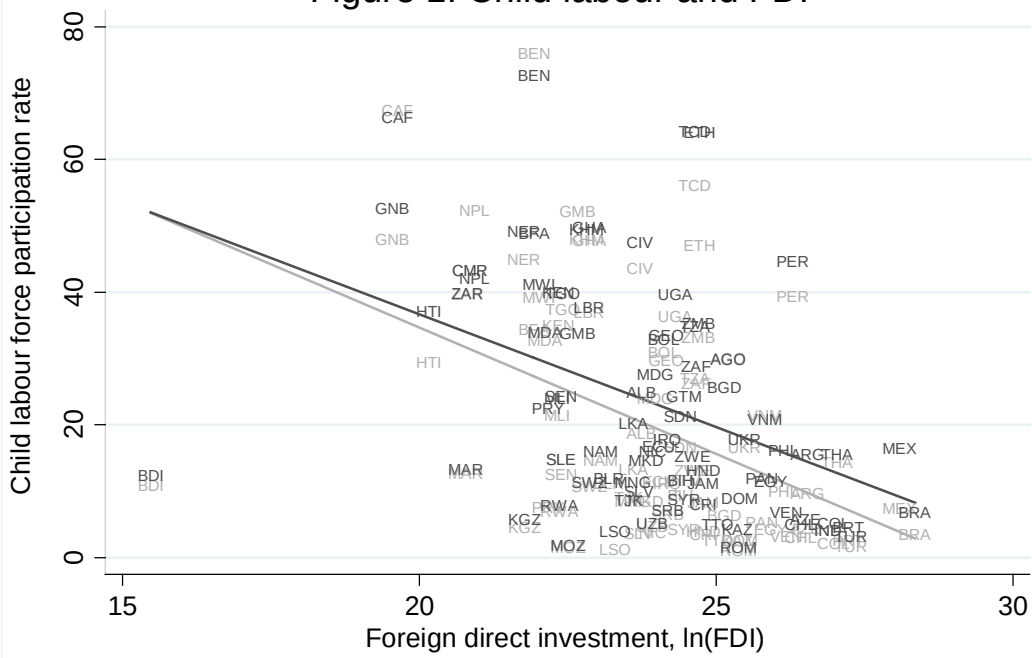
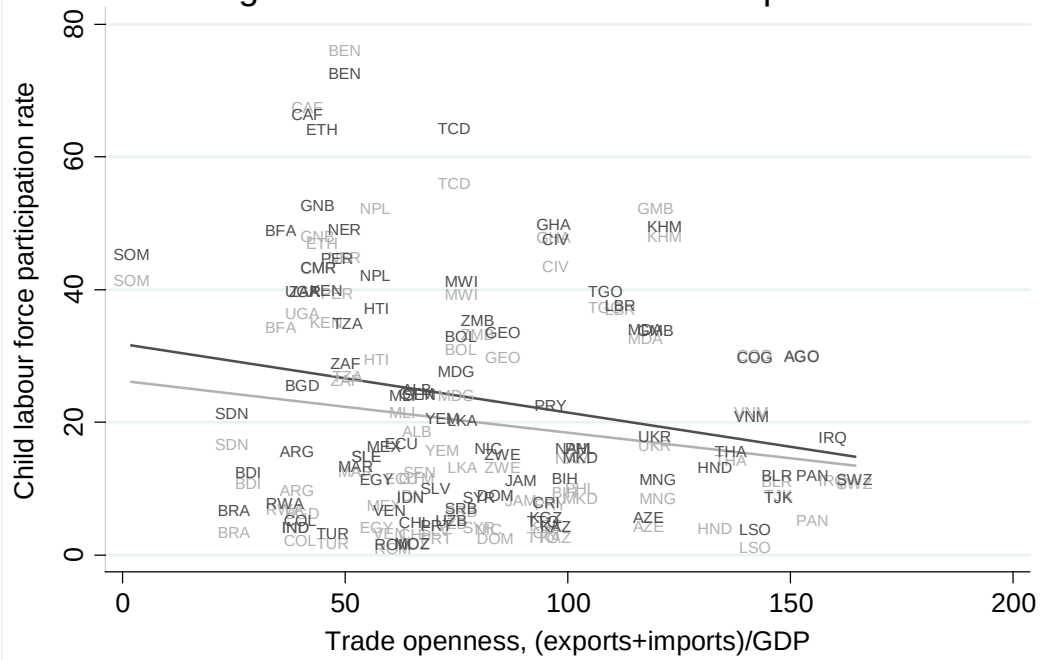
Figure 1: Child labour and FDI



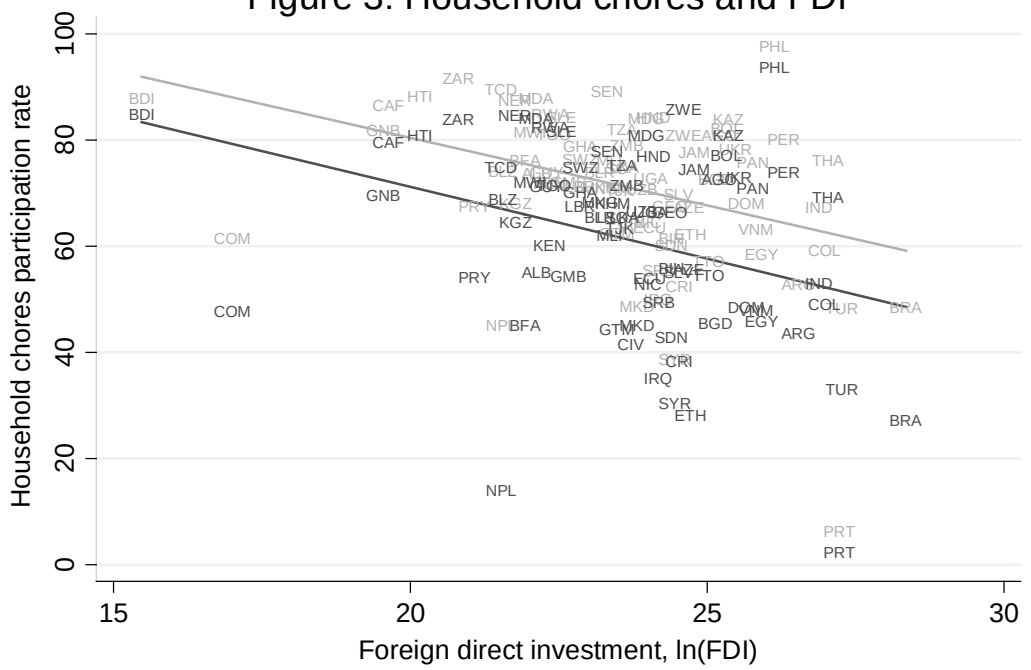
Country code labels and fit line corresponding to girls are labelled in light grey while line and labels for boys are in darker grey.

Figure 2: Child labour and trade openness



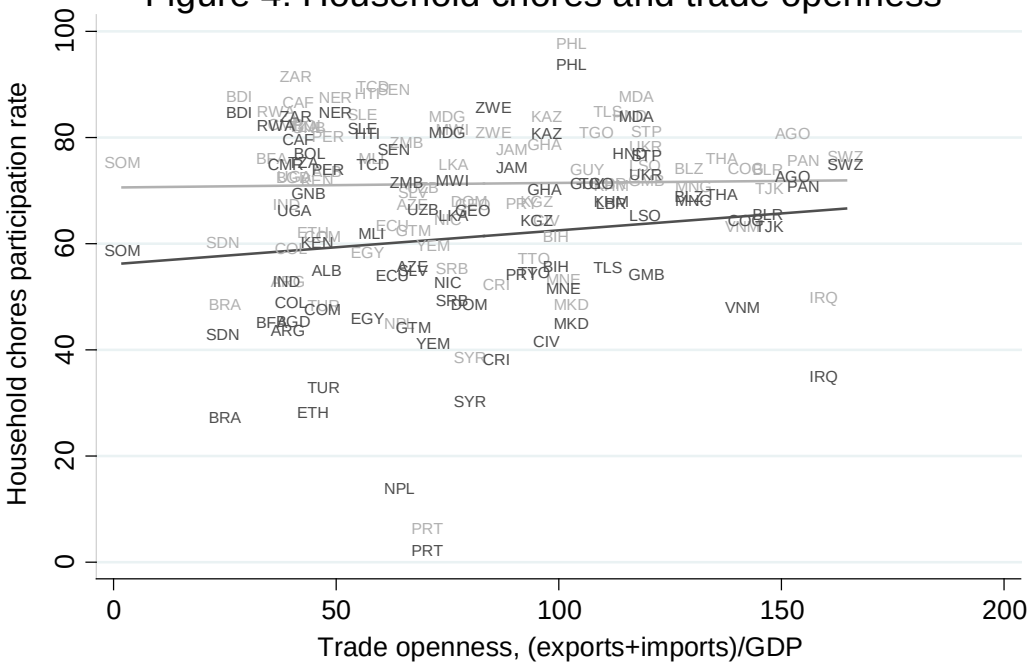
Country code labels and fit line corresponding to girls are labelled in light grey while line and labels for boys are in darker grey.

Figure 3: Household chores and FDI



Country code labels and fit line corresponding to girls are labelled in light grey while line and labels for boys are in darker grey.

Figure 4: Household chores and trade openness



Country code labels and fit line corresponding to girls are labelled in light grey while line and labels for boys are in darker grey.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Economic activity (per cent of total)	266	23.06	18.66	0.60	76.10
Girls	133	20.15	17.98	0.60	76.10
Boys	133	23.98	17.69	1.50	72.80
FDI (log of net inflows, U.S. dollars)	133	23.73	2.28	15.48	28.36
Trade openness (%)	133	74.78	34.48	18.77	164.60
ln(population)	133	16.39	1.29	13.89	20.81
Income (log of per capita GDP, U.S. dollars)	133	6.70	1.15	4.44	9.36
Year	133	2004	2.94	1996	2009
Noneconomic activity (per cent of total)	206	66.43	16.68	2.40	97.80
Girls	103	71.94	13.67	6.40	97.80
Boys	103	60.92	17.65	2.40	93.90
FDI (log of net inflows, US dollars)	103	23.72	2.59	15.48	28.61
Trade openness (%)	103	73.65	36.77	18.77	164.60
ln(population)	103	16.33	1.44	12.46	20.81
Income (log of per capita GDP, U.S. dollars)	103	6.65	1.65	4.44	9.36
Year	103	2003	2.79	1998	2008

Table 2: Economic activity (child labour) & FDI

	(1)		(2)		(3)		(4)	
	Male	Female	Male	Female	Male	Female	Male	Female
ln(FDI)	-4.22	-4.40	-0.66	-0.63	-6.31	-6.54	1.86	1.73
	(1.04)**	(1.03)**	(1.39)	(1.35)	(1.41)**	(1.44)**	(4.23)	(3.88)
ln(income)			-7.88	-8.34			-11.72	-11.82
			(2.03)**	(1.87)**			(5.60)**	(4.99)**
ln(population)	1.36	1.18	-0.83	-1.14	3.48	3.26	-2.58	-2.83
	(1.17)	(1.13)	(1.25)	(1.25)	(1.49)**	(1.45)**	(3.25)	(3.09)
F-stat comparing male & female:								
ln(FDI)		0.03		0.00		0.02		0.00
ln(income)				0.06				0.00
IV for FDI	No	No	No	No	Yes	Yes	Yes	Yes
IV for income			No	No			Yes	Yes
F-stat of excluded instruments:								
FDI regression					73.63	73.63	52.65	52.65
Income regression							836.89	836.89
Shea partial R^2 of excluded instruments:								
FDI regression					0.37	0.37	0.05	0.05
Income regression							0.10	0.10
Observations	133	133	133	133	126	126	112	112
R-squared	0.24	0.25	0.35	0.37	0.17	0.20	0.36	0.39

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%

Table 3: Economic activity (child labour) & trade openness

	(1)		(2)		(3)		(4)	
	Male	Female	Male	Female	Male	Female	Male	Female
Openness	-0.16	-0.15	-0.13	-0.11	-0.58	-0.56	-0.43	-0.40
	(0.04)**	(0.04)**	(0.04)**	(0.04)**	(0.16)**	(0.16)**	(0.14)**	(0.14)**
ln(income)			-8.27	-8.78			-8.10	-8.46
			(1.12)**	(1.04)**			(1.30)**	(1.26)**
ln(population)	-4.31	-4.39	-2.99	-2.99	-8.65	-8.81	-6.24	-6.21
	(1.18)**	(1.25)**	(1.07)**	(1.06)**	(2.28)**	(2.33)**	(1.93)**	(1.98)**
F-stat comparing male & female:								
Openness		0.19		0.33		0.02		0.05
ln(income)				0.18				0.08
IV for openness	No	No			Yes	Yes	Yes	Yes
IV for income			No	No			Yes	Yes
F-stat of excluded instruments:								
Openness regression					20.84	20.84	10.08	10.08
Income regression							841.77	841.77
Shea partial R^2 of excluded instruments:								
Openness regression					0.14	0.14	0.15	0.15
Income regression							0.87	0.87
Observations	133	133	133	133	126	126	112	112
R-squared	0.11	0.10	0.40	0.41	0.00	0.00	0.26	0.29

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%

Table 4: Economic activity (child labour), trade openness & FDI

	(1)		(2)		(3)		(4)	
	Male	Female	Male	Female	Male	Female	Male	Female
Openness	-0.08	-0.06	-0.14	-0.11	-0.44	-0.41	-0.45	-0.42
	(0.04)**	(0.04)	(0.04)**	(0.03)**	(0.15)**	(0.15)**	(0.15)**	(0.15)**
ln(FDI)	-3.72	-4.06	0.77	0.54	-5.59	-5.86	2.26	2.10
	(1.05)**	(1.03)**	(1.44)	(1.60)	(2.02)**	(2.03)**	(4.96)	(4.74)
ln(income)			-9.21	-9.44			-10.83	-11.00
			(2.58)**	(2.52)**			(6.04)*	(5.65)*
ln(population)	-0.14	0.16	-3.71	-3.50	-2.22	-2.08	-8.07	-7.92
	(1.29)	(1.31)	(1.32)**	(1.37)**	(3.04)	(3.08)	(4.71)*	(4.66)*
F-stat comparing male & female:								
Openness		0.73		0.69		0.03		0.05
ln(FDI)		0.11		0.02		0.02		0.00
ln(income)				0.01				0.00
IV for openness	No	No	No	No	Yes	Yes	Yes	Yes
IV for FDI	No	No	No	No	Yes	Yes	Yes	Yes
IV for income			No	No			Yes	Yes
F-stat of excluded instruments:								
Openness regression					10.78	10.78	7.01	7.01
FDI regression					40.80	40.80	35.74	35.74
Income regression							556.00	556.00
Shea partial R^2 of excluded instruments:								
Openness regression					0.14	0.14	0.16	0.16
FDI regression					0.38	0.38	0.07	0.07
Income regression							0.11	0.11
Observations	133	133	133	133	126	126	112	112
R-squared	0.26	0.26	0.40	0.41	0.00	0.00	0.31	0.33

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%

Table 5: Noneconomic activity (chores) & FDI

	(1)		(2)		(3)		(4)	
	Male	Female	Male	Female	Male	Female	Male	Female
ln(FDI)	-2.86	-2.81	-0.06	0.08	-3.18	-3.05	-1.52	0.41
	(0.74)**	(0.66)**	(1.12)	(0.83)	(1.32)**	(1.10)**	(4.33)	(2.70)
ln(income)			-6.69	-6.91			-3.25	-5.96
			(2.44)**	(1.97)**			(6.13)	(3.85)
ln(population)	-0.47	1.98	-2.33	0.06	0.11	2.31	-1.29	-0.69
	(1.19)	(0.94)**	(1.13)**	(0.86)	(1.73)	(1.35)*	(3.92)	(2.49)
F-stat comparing male & female:								
ln(FDI)		0.00		0.03		0.01		0.51
ln(income)				0.01				0.49
IV for FDI	No	No	No	No	Yes	Yes	Yes	Yes
IV for income			No	No			Yes	Yes
F-stat of excluded instruments:								
FDI regression					62.58	62.58	45.23	45.23
Income regression							249.41	249.41
Shea partial R^2 of excluded instruments:								
FDI regression					0.39	0.39	0.07	0.07
Income regression							0.12	0.12
Observations	103	103	103	103	99	99	89	89
R-squared	0.18	0.17	0.26	0.31	0.13	0.13	0.21	0.27

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%

Table 6: Noneconomic activity (chores) & trade openness

	(1)		(2)		(3)		(4)	
	Male	Female	Male	Female	Male	Female	Male	Female
Openness	0.03	-0.01	0.07	0.02	-0.10	-0.16	-0.26	-0.26
	(0.05)	(0.04)	(0.05)	(0.04)	(0.10)	(0.09)*	(0.19)	(0.14)*
ln(income)			-7.06	-6.89			-4.35	-4.51
			(1.61)**	(1.41)**			(1.98)**	(1.67)**
ln(population)	-2.81	-0.94	-1.45	0.39	-4.32	-2.62	-5.47	-3.09
	(1.41)**	(1.11)	(1.36)	(1.11)	(1.53)**	(1.22)**	(2.43)**	(1.82)*
F-stat comparing male & female:								
Openness		1.08		1.35		0.50		0.00
ln(income)				0.02				0.01
IV for openness	No	No	No	No	Yes	Yes	Yes	Yes
IV for income			No	No			Yes	Yes
F-stat of excluded instruments:								
Openness regression					26.51	26.51	6.10	6.10
Income regression							212.38	212.38
Shea partial R^2 of excluded instruments:								
Openness regression					0.22	0.22	0.11	0.11
Income regression							0.74	0.74
Observations	103	103	103	103	99	99	89	89
R-squared	0.08	0.01	0.28	0.31	0.03	0.00	0.01	0.02

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%

Table 7: Noneconomic activity (chores), trade openness & FDI

	(1)		(2)		(3)		(4)	
	Male	Female	Male	Female	Male	Female	Male	Female
Openness	0.11	0.05	0.08	0.02	-0.03	-0.09	-0.26	-0.26
	(0.06)*	(0.06)	(0.06)	(0.05)	(0.11)	(0.09)	(0.20)	(0.15)*
ln(FDI)	-3.49	-3.13	-0.81	-0.13	-3.12	-2.86	-3.00	-1.04
	(0.81)**	(0.91)**	(1.80)	(1.38)	(1.45)**	(1.25)**	(6.26)	(4.35)
ln(income)			-6.00	-6.72			-0.36	-3.13
			(3.42)	(2.32)**			(8.84)	(6.09)
ln(population)	1.59	3.00	-0.63	0.52	-0.23	1.12	-2.79	-2.17
	(2.19)	(1.81)	(2.15)	(1.63)	(2.59)	(2.02)	(6.42)	(4.41)
F-stat comparing male & female:								
Openness		1.00		1.19		0.60		0.00
ln(FDI)		0.16		0.25		0.05		0.20
ln(income)				0.10				0.21
IV for openness	No	No	No	No	Yes	Yes	Yes	Yes
IV for FDI	No	No	No	No	Yes	Yes	Yes	Yes
IV for income			No	No			Yes	Yes
F-stat of excluded instruments:								
Openness regression					13.66	13.66	4.14	4.14
FDI regression					34.76	34.76	30.78	30.78
Income regression							169.20	169.20
Shea partial R^2 of excluded instruments:								
Openness regression					0.21	0.21	0.14	0.14
FDI regression					0.40	0.40	0.10	0.10
Income regression							0.14	0.14
Observations	103	103	103	103	99	99	89	89
R-squared	0.22	0.19	0.28	0.31	0.12	0.06	0.00	0.00

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%