Courant Research Centre
'Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis'

Georg-August-Universität Göttingen
(founded in 1737)

Discussion Papers

No. 129

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October 2012

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Globalization and Female Labor Force Participation in Developing Countries: An Empirical (Re-)Assessment

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Abstract

We investigate the impact of foreign direct investment (FDI) and trade, as two measures of globalization, on female labor force participation in a sample of 80 developing countries over the last decades. Contrary to the mainstream view in the literature, which is mainly based on country-case studies or simple cross-country variation, we find that both, FDI and trade have a generally negative impact on female labor force participation. While the impact is of negligible economic size, it is stronger for younger cohorts, potentially reflecting a higher incentive to stay out of the labor force and invest in education in view of an increased skill premium due to globalization.

We also find that the direction of the effect depends on the industrial structure of the economy. This suggests that there is no evidence of a (conditional) anti-female bias in multinational corporations' factor demand once one controls for the interaction of FDI with the size of the agricultural sector. We can thereby explain why country studies find other effects and question the generalization of their results into an overarching globalization tale concerning female labor force participation.

Keywords: Globalization, Labor Force Participation, FDI, Trade, Development, Hierarchical Panel Data Models

JEL Classifications: F0, J22, O1

Acknowledgements

We would like to thank Stephan Klasen, Jenny Aker, and other participants of a seminar at the University of Göttingen for their helpful comments. K.M. Wacker thanks the German Academic Research Foundation (DAAD) and the Chinese Scholarship Council (CSC) for financial support. All remaining errors are ours.

Disclaimer

1. Introduction

The increase in female labor force participation (FLFP) is one of the most significant global developments of the last decades. There is a broad consensus that this is in general a welcome trend since it may contribute to women's economic empowerment and reduce economic costs associated with the underutilization of women's skills and labor (Klasen and Lamanna, 2009; World Bank, 2011). However, the determinants of this development are more controversial.

Many contributions to the applied labor economics literature in this context have focused on the United States and some European countries (e.g. Killingsworth and Heckman, 1986; Blundell and MaCurdy 1999; Blau and Kahn 2007). Concerning developing countries, one strand in the field argues that there exists a U-shaped relationship between development and the labor force participation of married women (e.g. Goldin 1990 and 1995, Mammen and Paxson 2000). This is because at very low levels of income, agriculture dominates and a large proportion of females are in unpaid agricultural employment. With rising incomes, the introduction of new production technology, and transition to a formal-sector based industrial economy, the income effect (from higher earnings of the spouse) dominates the substitution effect in the labor force participation decision of married women, leading to a fall in the FLFP rate (FLFPR). Women face negative biases against female industrial workers and the incompatibility of formal sector employment with traditional care-giving activities at this stage of the development process. As development continues, female education increases and the substitution effect begins to outweigh the income effect, leading to an increase in the FLFPR (Goldin 1990 and 1995). However, Gaddis and Klasen (2012) show that empirical support for the U-shaped relationship between FLFPR and aggregate GDP is not robust across different data sources and specifications, and is particularly weak in non-OECD countries. They also show that agriculture, mining, manufacturing and services generate different dynamics for female employment

Another line in the literature has argued that increased openness has led to an increase in the FLFPR in developing countries. There are several interconnected channels through which globalization could lead to a feminization of the labor force. Due to existing gender discrepancies, women might be prepared to work long for a low wage and without joining a union. Therefore, exporting and multinational firms are more likely to employ women, especially since most tasks of the industries where developing countries have a comparative advantage are less skill-intensive or a priori expected to be female-intensive (Çağaty and Berik, 1990; Anderson, 2005). Even if male-intensive sectors benefit most from increased openness, FLFP may rise in equilibrium since men might leave female-intensive industries to take up new jobs in the export sector, thereby opening up employment opportunities for women (Sauré and Zoabi, 2009).[1] The process might be accelerated by structural adjustment programs that were often implemented in the course of increased openness since the accompanied increase in labor market flexibility would make it easier for firms to substitute women for men (Standing, 1989; Çağaty and Özler, 1995).

Empirical contributions that we review in section 2 and summarize in the table in Appendix B have found some support for this positive relationship between globalization and FLFP. However, they are mostly based on individual country-studies or simple pooled cross-country OLS regressions. We therefore introduce our data and methodology in section 3 and improve on previous studies in a number of ways. First, we reduce potential parameter biases due to unobserved cross-country heterogeneity by basing identification exclusively on over-time variation. Second, we investigate heterogeneity of effects across age cohorts. Third, we accommodate the sectoral structure of the investigated economies by allowing for interactions of FDI with industrial / agricultural value added and considering overall trade, overall exports and exports in services separately. Finally, we estimate separate coefficients by region to allow for regional heterogeneity. We present our results in section 4. Contrary to the main contributions of the literature, our results suggest that globalization generally has a negative effect on FLFP which is more pronounced among younger age cohorts and depends on the industrial structure of the economy. There also appears to be a large degree of regional heterogeneity in the results. We discuss the results and conclude the paper in section 5.

2. Review of the Empirical Literature[2]

Based on rather descriptive and anecdotal evidence, early case studies such as Cho and Koo (1983), Hein (1984), ILO (1985), or, later on, by Kabeer and Mahmu (2004) suggest that aspects related to globalization, such as export-led industrialization, export processing zones and increased employment in multinational firms have had a positive impact on FLFP. Using

[1] Similarly, arguments in line with the agricultural linkages literature (Lele and Mellor, 1981; Mellor and Lele, 1973, 1975) can be built where the openness-induced surge in the male-intensive sector also spills over to the female-intensive sector through production and consumption linkages.
[2] We also provide an overview of the related empirical literature in the table in Appendix B.

a fairly simple OLS regression for 3-digit SIC Turkish manufacturing industries in 1966 and 1982, Çağaty and Berik (1990) show that the ratio of exports to output had a statistically significant positive impact on the female share of wage workers. A similar empirical strategy is applied to Indian industry data from the late 1990s and early 2000s by Pradhan (2006), who finds that exports have a significant and positive (though economically small) impact on the female/male working-days ratio, while FDI has no significant impact.

Özler (2000) builds upon this strand of the literature by using plant-level data for the period 1983-1985 from the Turkish manufacturing sector and shows that the female share of employment in a plant increases with the export to total output ratio of its sector. In line with the arguments above, she notes that women are often employed in low-skill and low-paid jobs and especially among those establishments where investment in machinery and equipment leads to a decline in the female employment share, thus pointing to dynamic long-run effects disadvantageous to a feminization of the labor force (in this context, see also Wood, 1998 and Seguino, 2000). This suggests, globalization may first lead to an expansion of female-intensive sectors which then rationalize production by investment and technological progress. However, while the plant-level perspective of the study has certain advantages, it fails to convincingly resolve the problem of an unobserved heterogeneity bias and cannot reveal any spill-over effects on non-manufacturing sectors. Such spill-over effects are documented in Gaddis and Pieters (2012), who show that trade liberalization reforms in Brazil in the late 1980s and early 1990s were associated with an increase in female labor force participation after a period of around two years, caused largely by rising female employment in the non-tradable (service) sector.

Tying in with the above-mentioned literature on the feminization-U, Çağaty and Özler (1995) use another approach by using pooled data from 1985 and 1990 for 165 countries to investigate the impact of long-term development on the female share of the labor force. They argue that structural adjustment policies have led to an increase in feminization of the labor force via worsening income distribution and increased openness.

Gray et al (2006) use data for 180 countries at five-year intervals between 1975 and 2000 to estimate the impact of trade (measured as the log of total imports plus total exports to GDP), FDI (as a percentage of the gross fixed capital formation) and other globalization-related variables on the female percentage share of the workforce and other female-specific outcome variables. Their finding (p. 319ff) that none of the two former variables has a significant impact on (relative) FLFP may be due to the fact that they exert a converse impact in developing versus industrialized countries; a heterogeneity that results in overall insignificant estimates.

Similarly, Bussmann (2009) addresses the wider research question whether economic globalization (in particular, trade / GDP) improves certain aspects of women's welfare (especially health and education). Using fixed effects and generalized methods of moments techniques for annual panel data in the period 1970 – 2000, she finds that trade / GDP increases overall FLFP in non-OECD countries.

While there are some opposite arguments highlighting that FDI in developing economies benefits male engineers or computer programmers more than female ones because they are likely to be better educated (Oostendorp, 2009), or pointing to occupational gender segregation (Greenhalgh, 1985; Anker, 1998, Anker et al., 2003),[3] the large majority of empirical studies seems to suggest that globalization has raised FLFP in developing countries.

In our view, however, these supposed "stylized facts" suffer from certain methodological shortcomings that give rise to our empirical re-assessment. First, we find it risky to generalize from country-case studies to an overarching tale of globalization, feminization and development. On the other hand, most cross-country studies so far have suffered from the problem of potentially biased estimates due to unobserved heterogeneity. Finally, rather short time dimensions have imposed certain restrictions on the equilibrium dynamics of the relationship between openness and FLFP. By using a comprehensive panel of 80 developing countries over almost three decades and applying a fixed-effects methodology, we can deal with all of these potential problems and show that this leads to quite contrary results than the ones obtained in the mainstream literature.

[3] Note that the effect of occupational gender segregation on female labor force participation in the context of globalization is not clear a priori and depends on the elasticity of substitution between female and male labor, the pattern of trade liberalization, and associated relative demand shifts.

3. Data and Methodology

3.1 Data

We use data on FLFP from the 5th revision of the ILO's Estimates and Projections of the Economically Active Population (EAPEP) database (ILO, 2009). The EAPEP contains data on the male and female economically active population based on country reports and ILO staff estimates for 191 countries, which includes both industrialized and developing countries. The 5th revision data cover the period 1980 - 2008; the data thus have a high overlap with our FDI and trade data. In line with Gray et al. (2006) and Gaddis and Klasen (2012) and in order to minimize problems associated with serial correlation and to focus more on long-run effects, we consider the observations for every fifth year over the period 1980 - 2005 for estimation.[4] The FLFPR is defined as the number of economically active women divided by the total female population (FPOP) of the relevant age group *j* in country *i* at time *t*:

$$FLFPR_{ijt} = \frac{FLFP_{ijt}}{FPOP_{ijt}}. \qquad (1)$$

The ILO definition of economic activity captures all persons (employed or unemployed) that supply labor for activities included in the United Nations System of National Accounts (SNA; cf. ILO, 1990). This includes self-employment for the production of marketed goods and services as well as the production of goods consumed within the household. It does, however, not include the production of non-marketed services (domestic tasks, nursing of own children), since they are not included in the SNA. This distinction is important to remember, as many women outside of the labor force are employed in producing such non-marketed services. It should also be noted that the EAPEP data only provide information on economic activity rates, but not on total hours worked. Hence, the data allows us to investigate changes in labor supply at the extensive margin (participation decision) but not at the intensive margin (hours worked).

As a main explanatory variable, we use the stock of inward foreign direct investment (FDI) relative to GDP, taken from UNCTAD, as a proxy for the activity of multinational firms in the

[4] This should generally be similar to using 5-year averages. However, much data is only available for every 5th year (e.g. the Barro and Lee, 2010, dataset), or values between these observation points are interpolated (e.g. for certain values in the EAPEP database) so that the argument for using 5-year averages is rather weak.

economy under investigation. Financial stock data, as opposed to operational data (such as multinationals' sales, number of employees) reflects the effective share of foreign ownership in host country firms and is available for a large group of countries and years (cf. Wacker, 2012, for a discussion of measuring FDI and multinational firms). Furthermore, we use trade, imports and exports relative to GDP as measures of globalization. These data include trade in goods *and* services and come from the World Bank World Development Indicators (WDI). WDI also provide most of our control variables such as GDP per capita in constant 2005 international $ purchasing power parities, the total fertility rate (births per woman), and the shares of agriculture and industry value added in GDP. From WDI, we also construct the percentage growth rate of real GDP p.c. (in constant local currency). Since we use fixed effect models, the fixed effect takes out the long-run average growth so that this variable should be interpreted as the cyclical component of the model. For years of schooling we use the female measures of the corresponding cohorts provided by Barro and Lee (2010).[5] An overview over the variables and their summary statistics are provided in table A.1 in the appendix.

Since we focus on developing countries, we follow the convention in the literature to consider countries classified as "low income" or "lower middle income" by the World Bank (for 1987, the first year available). This gives us a sample of 80 developing countries in total.

3.2 Descriptive Analysis

Figure 1 plots the distribution of the FLFPR for three decades (in 1985, in 1995 and in 2005).[6] As one can see, the distribution gets smoother in the center in 2005 when compared to the decades before, which is also reflected in a decreasing standard error in table 1. The steadily increasing mean of the distribution in table 1 also shows that FLFP indeed increased over the period usually referred to as "globalization."

[5] If we aggregate their data over various cohorts, we use the ILO female population data as weights. Linear interpolation is used to obtain data points between the 5-year survey intervals. This is necessary since most explanatory variables are lagged by one year.

[6] In order to make the data in and between figures 1 and 2 comparable, we only used observations which have no missing observations for FLFPR, FDI/GDP and trade/GDP in 1985, 1995 and 2005 for both graphs. We end up with 77 (developing) countries.

Figure 1: Distribution of Female Labor Force Participation Rate

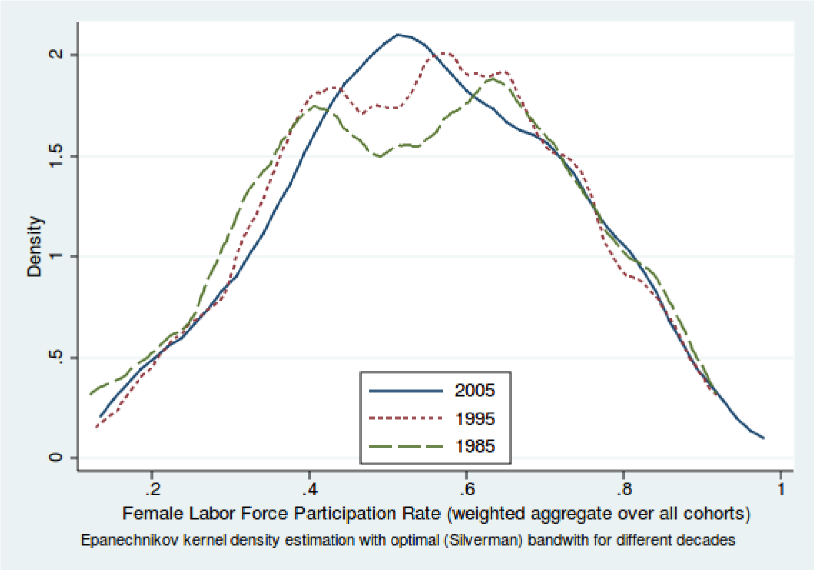
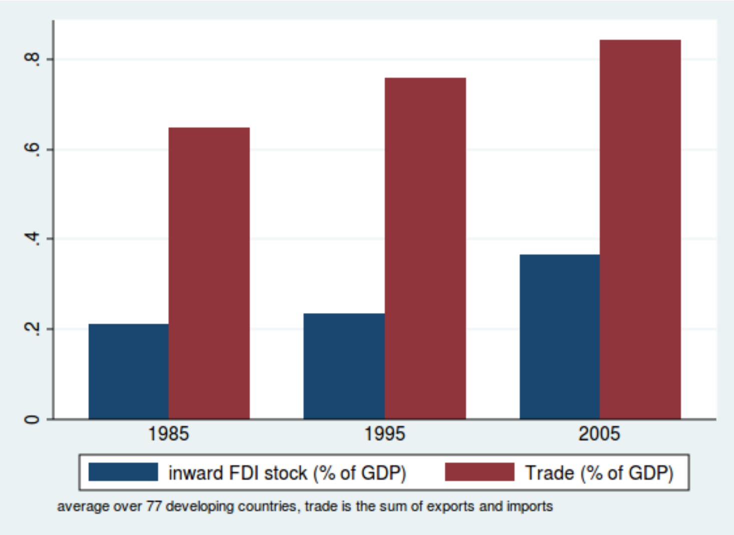


Table 1: Descriptive Statistics of Main Variables

Variable	Statistic	1985	1995	2005
FLFPR	Mean	0.507	0.524	0.549
	Std. Dev.	0.199	0.185	0.173
	Min	0.121	0.129	0.199
	Max	0.917	0.918	0.913
FDI stock / GDP	Mean	0.211	0.236	0.365
	Std. Dev.	0.339	0.275	0.355
	Min	$8x10^{-6}$	0.001	0.002
	Max	1.650	1.399	1.606
Trade / GDP	Mean	0.648	0.760	0.844
	Std. Dev.	0.376	0.408	0.401
	Min	0.130	0.025	0.003
	Max	1.517	2.133	2.121

Figure 2 depicts the development of our two variables measuring globalization, FDI stock / GDP and trade / GDP, for the same years. As one can see, trade to GDP increased relatively steadily throughout the three decades while FDI / GDP experienced its main surge only in the last decade.

Figure 2: Development of Main Explanatory Variables



3.3 Econometric Model

Following the literature of determinants of FLFP (Bloom et al., 2009; Çağaty and Özler, 1995; Gaddis and Klasen, 2012; Mammen and Paxson, 2000), we estimate a linear model where the dependent variable is the female labor force participation rate (FLFPR) in levels and is explained by a number of covariates *x*:

$$\frac{FLFP}{FPOP} = FLFPR = x_1\theta_1 + \ldots + x_k\theta_k + u, \qquad (2)$$

where *u* is an error term discussed below.

Our dataset thus has two levels of cross-sections: countries $i=1,\ldots,N$ and age cohorts[7] $j=1,\ldots,10$. In our model, which hence can be considered as "hierarchical", we use country-specific cohort fixed effects, i.e. fixed effects for every cohort which are allowed to vary by country. The reason is, first, that unobserved heterogeneity across countries is likely and the same holds for age cohorts. For example, the age cohort 15-19 years is less likely to join the labor force than the age cohort 35-39 if the former has a higher probability of being in education. Furthermore, we assume that these cohort-fixed effects are country-specific due to different educational systems and differing conceptions of life across countries. Note that not controlling for this unobserved heterogeneity will result in biased and inconsistent results if

[7] The age cohorts are 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60-64. We excluded the cohort of 65+ years from our analysis because labor force participation in this cohort is driven by factors that might be very different from other cohorts.

the heterogeneity is correlated with some right-hand side variables. This is a clear advantage over previous cross-section studies in the field. In our sample of 80 countries with 10 age cohorts, this leads to 80×10 = 800 cross-section fixed effects.

Furthermore, we control for time-fixed effects. This is motivated by the consideration that there may be global effects influencing FLFP which are correlated with our covariables. This may lead to both, biased results and cross-sectional dependence in the structure of the error term. Formally,

$$\frac{FLFP_{ijt}}{FPOP_{ijt}} = Z_{ijt}\theta + X_{it}\beta + u_{ijt}, \qquad (3)$$

where Z is a $10N{\cdot}T \times k$ matrix collecting the k country *and* cohort-specific covariables, X is a $10N{\cdot}T \times m$ matrix collecting the m country-specific covariables and u has the structure

$$u_{ijt} = \mu_{ij} + \gamma_t + \varepsilon_{ijt}, \qquad (4)$$

where μ and γ are the country-cohort and time fixed effects, respectively, which are estimated and ε is an i.i.d. error term.[8] Note that we only take every fifth observation in time, i.e. t=1980, 1985, …, 2005 and that the only cohort-specific covariable in Z is the educational data (hence, $k=1$). In each of the columns of X, there will be 10 identical entries.

In summary, our identification strategy exclusively uses the data variation *within the country-specific cohorts* over 5-year intervals, accounting for global shocks at every point in time.

[8] A potential shortfall of the FE estimator is the fact that the process we explore is likely to have a complex dynamic structure while FE can be seen as a 'short-run' estimator. An alternative dynamic estimator, however, is difficult to specify depending on the complexity of the dynamic process and will potentially suffer severely from parameter heterogeneity (cf. e.g. Pesaran and Smith, 1995; Phillips and Sul, 2003) which is in fact present as we show in later parts of this study. The FE estimator, in our view, has the advantage that its properties are studied extensively and well-known. Furthermore, our main explanatory variables, FDI stocks and trade (or, exports) relative to GDP are very persistent variables. Under such circumstances the static fixed-effects estimator can be biased from a (consistent) short-run estimator towards the long-run impact. More explanations and evidence are given in Baltagi and Griffin (1984), Egger and Pfaffermayer (2005), and Wacker (2012) but the main intuition is the fact that in the presence of an omitted lag structure, the high correlation between the included variable and its own lags causes an omitted variable bias by incorporating the impacts of deeper lags. We hence think that our FE estimates come at a relatively low risk, especially as we are using only every 5th observation year (hence looking at longer time periods), and will give a good intuition about the underlying economic forces at work. We discuss potential extensions for future research in the concluding section of this paper.

3.4 Error Structure of the Model

A concern of our model is the correlation structure of the idiosyncratic error ε. Despite using a 5-year interval, autocorrelation is one potential issue. Together with potential heteroscedasticity, this can easily be accommodated by using the heteroscedasticity and autocorrelation (HAC) robust approach of Huber (1967) and White (1980) to estimate the variance-covariance (VCV) matrix. However, the hierarchical structure of our model (cf. Wooldridge, 2003 and 2010: ch. 20 for an introductory treatment to such models) poses additional problems since, for example, the error ε_{ijt} is likely to be correlated with the error $\varepsilon_{i,j+1,t+1}$ because the individuals in cohort j in period t will be in cohort $j+1$ in period $t+1$. Furthermore, there might be correlation between all errors $\varepsilon_{.jt}$ within country i if there is a systematic measurement error on the country level. All these potential problems with standard inference in linear models point to different forms of error correlation *within* countries. In line with the conventional panel data literature and given the dimension of our data set, we can assume that $N \rightarrow \infty$ and hence the number of countries, which are considered to be the "clusters," is large while the size of these clusters (i.e. the cohorts by country) is small. As discussed in Wooldridge (2003: 134, see also 2010: 864ff) a robust estimate for the VCV matrix is obtained by clustering the errors on the country level. Assuming that the matrix W_i contains all fixed effects and explanatory variables, classified as X and Z above, for country i and that the corresponding parameter vector δ contains β, θ, μ, and γ, a robust VCV estimator for δ is given by

$$\widehat{VCV}(\hat{\delta}) = \left(\sum_{i=1}^{N} W_i' W_i\right)^{-1} \left(\sum_{i=1}^{N} W_i' \hat{\varepsilon}_i \hat{\varepsilon}_i' W_i\right) \left(\sum_{i=1}^{N} W_i' W_i\right)^{-1}, \qquad (5)$$

where $\hat{\varepsilon}_i$ is the $10T \times 1$ vector of residuals for country (i.e. cluster) i.[9] Using time-fixed effects is important in this context because it prevents the most likely form of cross-section, i.e. contemporaneous, correlation of the error term. We want to emphasize that clustering the errors at the country level has a tremendous impact on inference, as one would expect (cf. Wooldridge, 2010: 865). If one would (wrongly) cluster on the country-specific cohort level instead, which would be the standard option in most econometric packages, standard errors

[9] An alternative approach would be using some feasible generalized least squares (FGLS) model. Depending on the assumptions, this might provide statistically more efficient results, it is, however, computationally less efficient. We hence prefer our approach because we find the assumptions less demanding and in the worst case, our framework will provide conservative inference compared with potentially efficient FGLS results.

would be severely underestimated (cf. table A.2 in the appendix to the Working Paper version of this article).

4. Empirical Results

The first four columns of table 2 show regressions of the FLFPR on our main globalization variables without controlling for other effects (besides the fixed effects). One can see that the impact is negative throughout and statistically significant[10] only in two specifications for trade and exports. Note that trade and FDI are highly correlated,[11] so multicollinearity inflates standard errors (while parameter estimates are still consistent) and we therefore report specifications with both variables together and separately. The negative impact of trade is driven by exports, so we focus on exports for the remainder of the analysis. The most striking fact besides from wanting statistical significance and the negative sign of the estimated coefficient, is the notably small economic relevance of both effects. The highest parameter is -0.064 for exports in column (4), implying that a 10 percentage points increase in exports / GDP ratio, roughly the increase observed over the 20 years 1985 – 2005, leads to a 0.64 percentage points decrease of FLFPR. Considering that the actual increase in FLFPR during the 20 years between 1985 and 2005 was 4.2 percentage points, this is a rather small magnitude.

The remaining models in table 2 include our seven control variables. While there is some change in the levels of statistical significance, our overall result remains rather stable: There is no evidence so far, that globalization had an economically relevant impact on female labor market participation. With the control variables included, it is the FDI stock that seems to be more robust statistically, however, the magnitude is negligible since the estimated parameter, -0.0116 in the "best" case, implies that a 10 percentage points increase in FDI stock / GDP leads to a 0.12 percentage points decrease of FLFPR. Exports are only statistically significant when FDI stock is excluded (though standard errors are reasonable in model (5) as well), the economic relevance is barely higher than in the unconditional model (4), however.

[10] Unless stated otherwise we refer to statistical significance as significance at the 5 % level and call significance at the 10 % and 1 % level as weakly and strongly statistically significant, respectively.

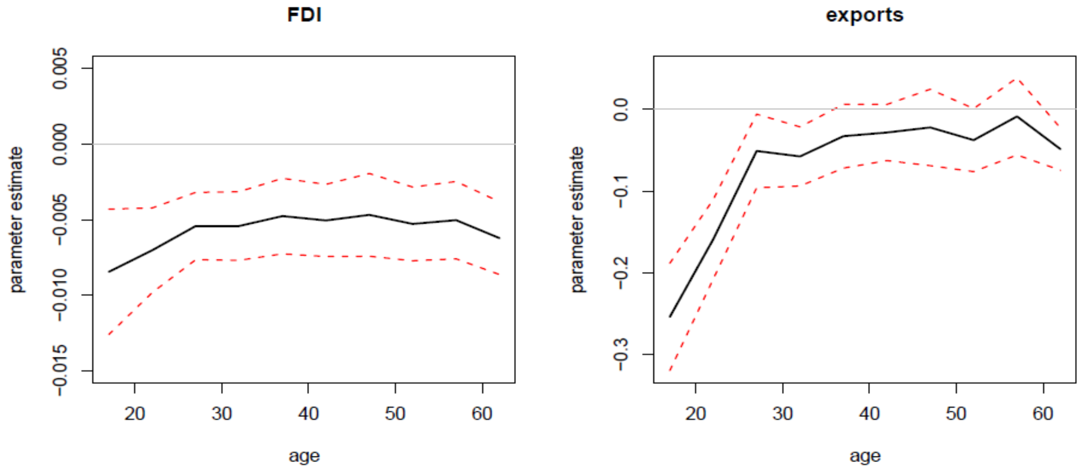
[11] Regressing FDI stock / GDP on the other covariables of model (7) using the same subsample and each 5th yearly observation leads to a highly significant estimator of 0.267 for trade / GDP (t-statistic 2.58).

Table 2: Main Regression Results

VARIABLES	(1) FLFPR	(2) FLFPR	(3) FLFPR	(4) FLFPR	(5) FLFPR	(6) FLFPR	(7) FLFPR	(8) FLFPR
ln(GDP p.c. PPP)					-0.120	-0.154*	-0.127	-0.0433
(-1)					(0.0900)	(0.0918)	(0.0904)	(0.0901)
ln(GDP p.c. PPP)^2					0.00901	0.0115	0.00939	0.00506
(-1)					(0.00684)	(0.00701)	(0.00688)	(0.00675)
fertility rate					-0.00508	-0.00707	-0.00499	-0.00247
					(0.00751)	(0.00753)	(0.00746)	(0.00709)
years of schooling					0.00612	0.00290	0.00558	0.00612
					(0.00751)	(0.00780)	(0.00747)	(0.00737)
agricultural value added					0.0530	0.0448	0.0511	0.0869*
					(0.0523)	(0.0537)	(0.0525)	(0.0512)
industry value added					-0.0320	-0.0349	-0.0401	0.0152
					(0.0435)	(0.0446)	(0.0431)	(0.0413)
GDP growth rate					-0.0510	-0.0461	-0.0521	-0.0630*
					(0.0406)	(0.0305)	(0.0428)	(0.0378)
Trade / GDP	-0.0215*		-0.0277**				-0.0142	
(-1)	(0.0127)		(0.0131)				(0.0169)	
FDI stock / GDP	-0.00424	-0.00120			-0.0116*	-0.00573**	-0.0115*	
(-1)	(0.00601)	(0.000950)			(0.00669)	(0.00236)	(0.00637)	
Exports / GDP				-0.0641**	-0.0370			-0.0698**
(-1)				(0.0260)	(0.0316)			(0.0325)
Constant	0.551***	0.536***	0.560***	0.560***	0.954***	1.084***	0.987***	0.600*
	(0.0100)	(0.00244)	(0.00992)	(0.00847)	(0.328)	(0.332)	(0.329)	(0.323)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	4,860	5,240	5,020	5,020	3,470	3,530	3,470	3,580
R-squared	0.190	0.141	0.171	0.176	0.221	0.200	0.219	0.199
Number of csec	1,120	1,150	1,120	1,120	800	800	800	800

Fixed effects regression taking every 5th year. Cluster-robust standard errors in parentheses.
***, **, * denote statistical significance at the 1 %, 5 %, and 10 % level, respectively.

Figure 3: Impact of globalization variables (+/- 2 standard errors) by cohort



These first results do not necessarily mean that our measures for globalization have no impact on women in their decision to join the labor force – they are aggregate effects and capture a wide range of different activities. In table 3 and figure 3 we show the impact of our measure on different cohorts. (Note that the vertical axis is differently scaled for the two panels in figure 3.) This means that we allow the parameter for the impact of our globalization variables to vary between age cohorts. The overall picture that emerges shows that the impact is stronger for younger cohorts. This corresponds to the rationale that more labor market variability in going on at younger age levels and that the income effect might be particularly strong at these cohorts when compared to the substitution effect: A potential rise in wages due to a globalization boost might increase household income via the father's or spouse's wage bill whereas the substitution effect between staying out of the labor force or joining it may even become negative in the short run since the skill-premia might have risen and this creates supplementary incentives to stay currently out of the labor force and invest in education, especially for young women where the premium pays off over a longer lifetime.

While the impact is still very small for FDI, the impact of exports is now considerable for young females' labor decision: The parameter is 0.254 and 0.159 for the age groups 15-19 and 20-24, respectively. A parameter of 0.2 would imply that a 10 percentage point increase in exports would result in a 2 percentage point decrease in the FLFPR, a non-negligible effect.[12] Note that the estimated impact is negative for all cohorts for both measures of globalization but not for all of them statistically significant in case of exports (the interval of +/- 2 standard errors roughly approximates a pointwise 95 % confidence interval).

[12] Remember from table 1 that FLFPR increased by roughly 2 percentage points per decade.

Table 3: Cohort-Specific Effects

	(1)	(2)
VARIABLES	FLFPR	FLFPR
ln(GDP p.c. PPP)	-0.154*	-0.0433
(-1)	(0.0920)	(0.0902)
ln(GDP p.c. PPP)^2	0.0115	0.00506
(-1)	(0.00701)	(0.00676)
fertility rate	-0.00707	-0.00247
	(0.00753)	(0.00710)
years of schooling	0.00290	0.00612
	(0.00781)	(0.00738)
agricultural value added	0.0448	0.0869*
	(0.0537)	(0.0512)
industry value added	-0.0349	0.0152
	(0.0447)	(0.0413)
GDP growth rate	-0.0461	-0.0630*
	(0.0305)	(0.0378)
	Effect of FDI…	**Effect of Exports…**
…at age 15-19	-0.00845**	-0.254***
(-1)	(0.00415)	(0.0657)
…at age 20-24	-0.00702**	-0.159***
(-1)	(0.00280)	(0.0487)
…at age 25-29	-0.00542**	-0.0508
(-1)	(0.00223)	(0.0451)
…at age 30-34	-0.00542**	-0.0575
(-1)	(0.00227)	(0.0362)
…at age 35-39	-0.00476*	-0.0327
(-1)	(0.00250)	(0.0391)
…at age 40-44	-0.00505**	-0.0282
(-1)	(0.00239)	(0.0344)
…at age 45-49	-0.00468*	-0.0220
(-1)	(0.00274)	(0.0468)
…at age 50-54	-0.00528**	-0.0375
(-1)	(0.00244)	(0.0386)
…at age 55-59	-0.00503*	-0.00847
(-1)	(0.00256)	(0.0472)
…at age 60-64	-0.00622**	-0.0485*
(-1)	(0.00241)	(0.0259)
Constant	1.084***	0.600*
	(0.333)	(0.323)
Year dummies	Yes	Yes
Observations	3,530	3,580
R-squared	0.201	0.225
Number of csec	800	800

Fixed effects regression taking every 5th year. Cluster-robust standard errors in parentheses.
***, **, * denote statistical significance at the 1 %, 5 %, and 10 % level, respectively.

What could explain such a pattern? If one thinks within a standard trade framework, after trade-liberalization, countries will develop those sectors of their economy where they have a comparative advantage. For least developed countries these are lower-skilled labor intensive industries. While women may have a "natural" advantage in some of these industries (for example, certain tasks in the textile sector), most other tasks may benefit from physical strength and hence primarily demand male labor. Accordingly, we would expect that the impact depends on the country's comparative advantage and this would suggest that the impact should generally be different between regions and depend on the country's competitive advantage. This is supported by a view at table A.2 in the appendix. For example, we find significant negative impacts of exports on female labor force participation in South and East Asia, and of FDI in Sub-Saharan Africa. Conversely we find a positive effect of FDI on women's economic activity in Eastern Europe/Central Asia. Generally, the table shows a considerable degree of variety between the different regions. It is also noteworthy that the primary sector exhibits a strong positive (and statistically highly significant) impact on FLFP in the MENA countries, whereas industry value added implies a negative and relevant (highly significant) impact in this region. This probably reflects the high share of mining (particularly from oil exploitation) in industrial value added in the region, a sector which traditionally employs few women (see also Gaddis and Klasen 2012: 20). Sectoral movements also seem to play an important role in the Eastern European/Central Asian countries.

Another exercise supports this view, see table 4. In the first two columns we allow FDI to interact with the value added in the industry sector and the primary sector, respectively. In the first column, FDI stock is highly significant and negative with a similar magnitude as in model (5) of table 2, the interaction is about 3.5 times the size of the mere FDI parameter and positive.[13] This means that once the industrial sector is developed, more FDI will have a positive impact on FLFP. More precisely, once the industrial sector accounts for at least 28 % of value added of the developing country's economy, additional FDI will have a positive impact.[14] The magnitude is still low: Assuming that the whole economy is producing half or all of its output in the industrial goods sector, a 10 percentage point increase in FDI stock / GDP will cause a 0.14 or 0.46 percentage point increase in FLFPR, respectively. This relationship is depicted in the left panel of figure 4. It shows that the higher the share of industry value added, the more favorable the marginal impact of FDI on FLFPR. The right panel does the same with agriculture, which basically is the mirrored image of the left panel. In order to get an impression for the economic magnitudes, we added some country examples to the graph. We included China in 1985, 1995 and 2005 because it serves as an example of a

[13] The parameter itself is not statistically significant (t-statistic 1.34). The relevant test statistic, however, is an F-test for joint significance of FDI and the interaction term. Here, we can reject that they jointly have no impact on FLFPR on the 1 % level of statistical significance.
[14] A 10 percentage point increase in FDI will have a 0.10 x (-0.0179) + 0.10x0.28x0.0642 = 0.0000076 percentage points impact in an economy where industry accounts for exactly 28% of value added.

developing country that has gone through an enormous structural change over the last decades and is well-known to the profession. From the right panel we see that the share of agriculture in China's value added has decreased from 1985 to 2005. This led to expansion of the industrial sector in the first decade and of the service sector in the second decade (the data point in 1995 and 2005 is almost identical in the left panel). This change has brought China into a more favorable/positive condition concerning the impact of FDI on FLFPR: Our model predicts that the effect of FDI on FLFPR was more positive in later years than in 1985.

Nepal in 1980 serves as an example of a very agrarian economy, the impact of FDI is accordingly negative. Finally, South Africa in 2005 was a fairly modern economy; the model would hence suggest a positive impact of FDI on FLFPR.

These results imply that the factor demand of multinational firms does not necessarily have a (conditional) anti-female bias since the above mentioned negative impact of FDI appears to be mainly driven by changes in the industry structure. This is supported by column (2) in table 4 where we allow FDI to interact with the primary sector. The negative impact of FDI now vanishes; it becomes insignificant and positive while the interaction with the primary sector is negative and insignificant.[15]

Similarly, with trade in column (3) of table 4 we find that its negative impact is, somewhat surprisingly, driven by trade in services – including trade in services into the model turns the overall export parameter estimate statistically insignificant, whereas trade in services is negative and highly significant but of small magnitude. This result is rather surprising on a first view because one would expect that women are very likely to work in the service sector. However, especially in the tradable service sector, the skill-premium might be high, hence inducing young women to invest more into education and hence stay off the labor market in younger cohorts. Furthermore, these results are in line with the findings of Oostendorp (2009) that globalization may benefit male engineers or computer programmers more than female ones because they are likely to be better educated, and with an aspect of the results of Bussmann (2009: 1035), that globalization is related to a lower percentage of women employed in the service sector in non-OECD countries.

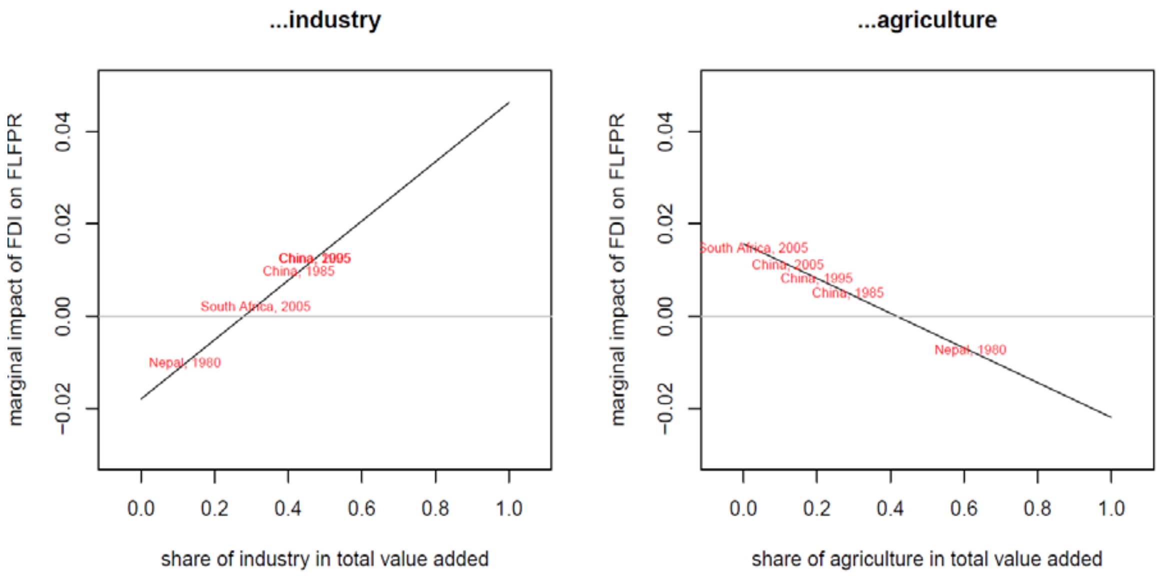
[15] They are jointly significant on the 1 % level using an F-test but the magnitude of the effect is again small.

Table 4: Interaction with Industrial Structure

VARIABLES	(1) FLFPR	(2) FLFPR	(3) FLFPR
ln(GDP p.c. PPP)	-0.132	-0.133	-0.144
(-1)	(0.0893)	(0.0885)	(0.0991)
ln(GDP p.c. PPP)^2	0.00987	0.00990	0.0100
(-1)	(0.00681)	(0.00676)	(0.00763)
fertility rate	-0.00500	-0.00498	-0.00302
	(0.00746)	(0.00756)	(0.00749)
years of schooling	0.00529	0.00494	0.00604
	(0.00746)	(0.00755)	(0.00814)
agricultural value	0.0484	0.0537	0.0523
added	(0.0529)	(0.0542)	(0.0565)
industry value added	-0.0674	-0.0487	-0.00549
	(0.0494)	(0.0444)	(0.0411)
GDP growth rate	-0.0423	-0.0451	-0.113**
	(0.0425)	(0.0421)	(0.0488)
Trade / GDP	**-0.0217**	**-0.0215**	
(-1)	**(0.0162)**	**(0.0163)**	
FDI stock / GDP	**-0.0179*** **	**0.0157**	
(-1)	**(0.00507)**	**(0.0246)**	
Industry v.a. × FDI	**0.0642**		
(-1)	**(0.0480)**		
Agricultural v.a. × FDI		**-0.0376**	
(-1)		**(0.0294)**	
Trade in Services / GDP			**-0.0473*** **
(-1)			**(0.0160)**
Exports / GDP			**-0.0251**
(-1)			**(0.0338)**
Constant	1.012***	1.013***	1.007***
	(0.322)	(0.319)	(0.349)
Year Dummies	Yes	Yes	Yes
Observations	3,450	3,450	3,280
R-squared	0.216	0.217	0.244
Number of csec	800	800	790

Fixed effects regression taking every 5th year. Cluster-robust standard errors in parentheses. ***, **, * denote statistical significance at the 1 %, 5 %, and 10 % level, respectively.

Figure 4: Impact of FDI depending on the Sectoral Structure of the Economy



As a robustness check, we investigate to what extent the obtained results change, when specifying another functional form of the model, namely a logarithmic model of the form

$$\log(FLFP)_{ijt} = Z_{ijt}\theta \;+ X_{it}\beta \;+ \alpha \log(FPOP)_{\mathrm{ijt}} + u \qquad (6)$$

In our view, this functional form has the advantage that it is economically more appealing than the standard models in the literature because it allows for interactions of covariables and does not force the response to be linear in the latter. Second, the model in equation (6) is more flexible because it does not pose the implicit restriction $\alpha = 1$.[16] Third, the model in equation (6) avoids meaningless predictions of the response variable.[17] Finally, the model in equation (6) is not necessarily more difficult to interpret because changes in any covariable can be interpreted as elasticity of FLFP (if the covariable is itself in logs) or as a percentage change in FLFP if the covariable changes by one unit (if it is not in logs).

The results from this exercise, reported in table A.3 in the appendix, are qualitatively similar to the ones obtained above. Parameter estimates for the interaction of FDI with industry value

[16] Note that if the restriction $\alpha = 1$ is indeed true, a restricted estimator will be more efficient than the model in equation (6). However, in the context of such a sample as large as the present one, we find this of minor relevance though it may be important for policy making and evaluation on the country level when facing a much smaller sample.
[17] Note that a linear model like in equation (2) may lead to predictions of the FLFPR that are smaller than 0 or larger than 100 % which does not make sense economically. Since in the model $\mathbf{E}[\ln(FLFP)] = X\theta$, the predictor for FLFP is $e^{X\theta}$, which is a positive number for any value of $X\theta$, a meaningful prediction of FLFP is ensured.

added and for FDI are statistically significant and highly significant, respectively, and are jointly highly significant (F-statistic of 5.53 with 2 and 79 degrees of freedom). While the prefix of the parameter estimates are the same as in table 4, the positive impact of the interaction is more dominant over the negative impact of the FDI stock: A positive impact of FDI on FLFP occurs at a level of industrial value added above 16.2 % of GDP. More precisely, for an economy producing half or all of its output in the industrial goods sector, a 10 % increase in FDI will cause a 0.8 or 2.1 % increase in FLFP, respectively. For this functional form, we also find that trade in services absorbs the negative impact of exports.

5. Discussion and Conclusion

We have investigated the influence of globalization as measured by trade and FDI on the FLFPR in a panel of 80 developing economies over the time period 1980 – 2005. The results suggest that openness generally has a negative but small impact on the FLFPR – which is in contrast to most previous studies that have generally found a positive effect. As an additional improvement over the previous literature, we have shown that the effect is stronger for young women. We think this is driven by the flexibility in younger years and by the fact that the potential rise in the skill premium due to globalization creates a particularly strong incentive for younger women to invest in education (and to hence not join the labor force) because the returns will be realized over a longer (expected) remaining lifetime. Both theoretical models and micro-econometric studies might help address this channel in the future.

A main takeaway from our study is that one should be very cautious in generalizing results from country-level studies to an overarching tale about the female labor market effects of globalization. First, we have shown that the effect, though being statistically significant, is negligible in economic terms. Also, the results presented in table A.2 show a large degree of regional heterogeneity. Our finding of a statistically significant positive effect of FDI on the FLFPR in Eastern Europe and Central Asia compared with a significant negative effect in Africa further supports our notion that the potentially increased skill-premium due to globalization/FDI creates incentives to build up human capital before joining the labor force: A high human capital stock (with relatively low gender inequality) was a heritage from the past in former centrally planned economies and would allow women to join the labor force and reap the benefits from an increased skill-premium right away, whereas female educational attainment is much lower in Africa (cf. Barro and Lee, 2010: table 3).

Since we show that the direction of the FDI impact on FLFPR depends on the size of the industrial/primary sector, our results strongly suggest that any economic explanation about the impact of globalization on FLFP has to take into account the industrial structure of the economy under consideration. Potential arguments could be built along the lines of a Lewis (1954) type labor market: In agrarian economies, a large pool of laborers is available. Since comparative advantages of these economies lies in sectors intensively using physical labor and surplus labor keeps wages low, multinational and exporting firms might be more likely to go for the “low hanging fruits” by drawing from the pool of male laborers. By still paying a somewhat higher wage (cf. Lipsey, 2002), the income effect on the household level might then have a small negative impact on FLFP and the mainstream argument of a female-intensive comparative-advantage sector does not hold for these countries. The more industrialized a country becomes, the smaller the pool of (male) surplus labor becomes and multinational and exporting firms might hence demand more female labor, especially since the process of industrial development and the division of labor will create linkages with the service sector where female labor is not “physically disadvantaged” and gender wage gaps might even provide an incentive to employ women, so that the mainstream arguments come into force at this development stage.

Our results can be seen in the context of the finding of Gaddis and Klasen (2012) that different industrial structures of the economy generate different dynamics for female employment. They also do not necessarily conflict with the results of previous case studies since they have been conducted in countries where industrial development was rather high compared with other developing economies which might have drive the results of these country-case studies.[18]

In terms of welfare and policy, our results of a generally negative effect of globalization on FLFPR is not necessarily bad news for women since their decrease in labor force participation might simply be the optimal response to benefit from an increased skill premium or because household income is sufficiently high and allows women to stay home if they want to. Indeed,

[18] The sampling period of Cagaty and Berik (1990) coincides with the time when Turkey reached the threshold level of industrial development of 28 % that we find in our study. Özler (2000) uses data from the mid-1980s when the size of the industrial sector in Turkey was about 27 % and hence close to our threshold of 28 % and clearly above the threshold of 16 % found in the multiplicative model. The data of Kabeer and Mahmu (2004) come from a 2001 survey when the industrial share made up for 26 % of the Bangladeshi economy. For Pradahn’s (2006) study on India around 2000, industrial value added was always over 25 % of GDP (all sector data: WDI).

Gray et al. (2006, pp. 317ff) find that trade (but not FDI) decreases female illiteracy rates for 180 countries (although the elasticity is rather small) and Bussmann (2009, p. 1032) also finds some evidence that women in non-OECD countries get more access to education when trade/GDP is growing, at least in primary and secondary schools. We show in simple regressions of female years of schooling on the globalization measures reported in table A.4 in the appendix that increased exports (for which we find a stronger impact on FLFPR than for FDI) are also positively correlated with female educational attainments in our sample. The parameter of 0.78 in the first column of the table would mean that women respond to a 10 % increase in exports/GDP by staying 7.8 years longer in school – years they are generally absent from the labor force.[19]

Therefore, while our aggregate results challenge the viewpoint of a large fraction of the literature arguing that globalization generally has a positive impact on FLFP in developing countries, this does not mean that a negative relationship necessarily exercises an adverse impact on female well-being or empowerment. However, problems may arise under bounded rationality, e.g. if women do not enter the labor force because family income is sufficient, but do neither engage in educational programs even though this will decrease their probability of finding a job in the future. If a shock occurs in the future, as is likely to be the case in open developing countries, and household income declines, females will find it more difficult to make up for this wage decrease because of forgone job-market experience.

An important policy implication stemming from this study is that countries that open up for globalization should tightly monitor developments on their female labor market. Long-term employability of women who leave the labor force because of sufficiently increased household earnings should be ensured. This may include continued education programs or offering more flexible working schedules.

[19] We also include a Random Effects specification in column (2) to take into account variation *between* countries and hence a longer-run perspective.

Appendix A.

Countries Included:

Albania, Armenia, Bangladesh, Belize, Benin, Bolivia, Botswana, Burundi, Cambodia, Cameroon, Central African Republic, Chile, China, Colombia, Congo, Rep., Costa Rica, Cote d'Ivoire, Cuba, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Fiji, Gambia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Lao PDR, Lesotho, Liberia, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Niger, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Rwanda, Senegal, Sierra Leone, Slovak Republic, South Africa, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Uganda, Ukraine, Vietnam, Yemen, Rep., Zambia, Zimbabwe

Table A.1: Summary Statistics

Name	Obs	Mean	Std. Dev.	Min	Max
FLFPR	3470	0,54	0,23	0,01	0,98
ln(GDP p.c. PPP)	3470	6,67	1,02	4,69	8,82
fertility rate	3470	4.21	1,61	1,10	7,813
years of schooling	3470	4,79	2,85	0,26	11,53
agricultural value added	3470	0,24	0,14	0,02	0,72
industry value added	3470	0,29	0,10	0,10	0,72
GDP growth rate	3470	0,02	0,05	-0,14	0,37
FDI stock / GDP	3470	0,26	0,52	8,09e-06	6,91
Trade / GDP	3470	0,77	0,39	0,11	2,20
Exports / GDP	3470	0,34	0,20	,03	1,12
Trade in Services / GDP	3220	0,18	0,15	0,02	2,06

Summary Statistics based on those observations included in model (5)
Trade and Exports include goods *and* services

Table A.2: Effects by Region

	(1)	(2)	(3)	(4)	(5)	(6)
REGION	E. Asia	EE & CA	Latin Am.	MENA	S. Asia	SSA
VARIABLES	FLFPR	FLFPR	FLFPR	FLFPR	FLFPR	FLFPR
ln(GDP p.c. PPP)	0.170	-0.137	-0.172	-1.209***	0.535	-0.153*
(-1)	(0.225)	(0.0989)	(0.488)	(0.241)	(0.463)	(0.0763)
ln(GDP p.c. PPP)^2	-0.0188	0.0217**	0.0131	0.0839***	-0.0729*	0.0120**
(-1)	(0.0199)	(0.00660)	(0.0316)	(0.0160)	(0.0360)	(0.00573)
fertility rate	0.0167	-0.0361*	0.0186	-0.0846***	0.0582*	-0.0156*
	(0.0132)	(0.0184)	(0.0181)	(0.00745)	(0.0252)	(0.00873)
years of schooling	0.0371	0.00421	-0.0229**	-0.00210	-0.0349	0.00459
	(0.0242)	(0.00873)	(0.00878)	(0.00399)	(0.0225)	(0.00849)
agricultural value	-0.0329	-0.178*	0.129	0.359***	-0.422	0.0439
added	(0.121)	(0.0833)	(0.125)	(0.0703)	(0.356)	(0.0550)
industry value added	-0.170	-0.264**	-0.0337	-0.133***	0.624**	-0.0327
	(0.132)	(0.0949)	(0.0713)	(0.0203)	(0.243)	(0.0444)
GDP growth rate	0.0606	0.363***	-0.0447	-0.147***	0.130	-0.0387
	(0.110)	(0.0759)	(0.0396)	(0.0358)	(0.321)	(0.0506)
Exports / GDP	**-0.156****	**-0.131***	**0.0272**	**-0.0181**	**-0.629****	**0.00111**
(-1)	**(0.0591)**	**(0.0650)**	**(0.0394)**	**(0.0273)**	**(0.160)**	**(0.0328)**
FDI stock / GP	**-0.00584**	**0.0949****	**0.0365**	**-0.0295**	**0.851**	**-0.0118****
(-1)	**(0.0670)**	**(0.0410)**	**(0.0358)**	**(0.0182)**	**(0.480)**	**(0.00445)**
Constant	0.161	0.744*	0.958	4.866***	0.00351	1.188***
	(0.701)	(0.375)	(1.837)	(0.912)	(1.718)	(0.282)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550	290	680	270	270	1,410
R-squared	0.290	0.238	0.602	0.512	0.485	0.300
Number of csec	120	90	170	60	60	300

Fixed effects regression taking every 5th year. Cluster-robust standard errors in parentheses. ***, **, * denote statistical significance at the 1 %, 5 %, and 10 % level, respectively. EE & CA = Eastern Europe and Central Asia, MENA = Middle East and North Africa, SSA = Sub-Saharan Africa

Table A.3: Multiplicative Model

VARIABLES	(1) ln(FLFP)	(2) ln(FLFP)	(3) ln(FLFP)
ln(GDP p.c. PPP)	-0.343	-0.363	-0.363
(-1)	(0.251)	(0.245)	(0.273)
ln(GDP p.c. PPP)^2	0.0271	0.0289	0.0281
(-1)	(0.0192)	(0.0186)	(0.0209)
fertility rate	-0.0142	-0.00740	-0.0123
	(0.0266)	(0.0248)	(0.0265)
years of schooling	0.0114	0.0121	0.00674
	(0.0237)	(0.0234)	(0.0263)
agricultural value	0.152	0.108	0.170
added	(0.147)	(0.136)	(0.160)
industry value added	-0.0672	-0.192	-0.0667
	(0.104)	(0.122)	(0.104)
GDP growth rate	-0.0799	-0.0367	-0.225*
	(0.110)	(0.107)	(0.128)
Trade / GDP	**-0.00833**	**-0.0417**	
(-1)	**(0.0472)**	**(0.0444)**	
FDI stock / GDP	**-0.0164**	**-0.0402*** **	
(-1)	**(0.0183)**	**(0.0124)**	
Industry v.a. × FDI		**0.248***	
(-1)		**(0.131)**	
Trade in Services / GDP			**-0.0757***
(-1)			**(0.0436)**
Exports / GDP			**-0.000931**
(-1)			**(0.0961)**
ln(FPOP)	1.208***	1.210***	1.232***
(-1)	(0.0494)	(0.0491)	(0.0535)
Constant	-2.276**	-2.223**	-2.474**
	(0.905)	(0.887)	(0.962)
Year Dummies	Yes	Yes	Yes
Observations	3,470	3,450	3,280
R-squared	0.864	0.864	0.867
Number of csec	800	800	790

Fixed effects regression taking every 5th year. Cluster-robust standard errors in parentheses. ***, **, * denote statistical significance at the 1 %, 5 %, and 10 % level, respectively.

Table A.4: Correlation between Globalization and Female Education

VARIABLES	(1) yrs of schooling	(2) yrs of schooling
years of schooling		
(-1)		
Exports / GDP	0.779**	0.918**
(-1)	(0.375)	(0.363)
FDI stock / GDP	-0.111*	-0.119*
(-1)	(0.0638)	(0.0625)
Constant	3.925***	0
	(0.121)	(0)
Time Dummies	Yes	Yes
Estimation	Fixed Effects	Random Effects
Observations	3,750	3,750
Number of csec	830	830

Cluster-robust standard errors in parentheses. ***, **, * denote statistical significance at the 1 %, 5 %, and 10 % level, respectively.

Appendix B. Overview of Related Literature

Study	Data and coverage	Dependent variable	Globalization-related variables	Methodology	Disaggre gations	Impact
Aguayo-Tellez, Airola and Juhn (2010)	Mexico, census, household and establishment surveys data (manufacturing), 1990-2000	Female employment rate, gender wage gap and female wage bill share (industry level)	Effective tariff rates and trade flows (industry-level), exports and FDI (plant-level)	Decomposition (between and within industry shifts)	--	Trade liberalization under NAFTA and FDI deregulation led to rising female employment
Baslevent and Onaran (2004)	Turkey, labor force survey data, 1988-1994	Women's labor force participation and employment decision (individual and plant level)	Overall and female-intensive export-orientation (share of (female) export-oriented sectors in manufacturing) (province-level)	Probit (with lagged macro-economic variables as regressors)	Short- vs. long-term, single vs. married women	Positive effect of export orientation on female labor force participation in the long-run (esp. young/single women), effect vanishes if one controls for GDP
Bussmann (2009)	134 countries (high income and developing), 1970-2000	FLFP and female employment by sector	Trade/GDP, Export/GDP, Import penetration (country-level)	GMM	Sector	Positive effect of trade on FLFP in developing countries (particularly via employment in agriculture and industry) but negative effect in OECD countries
Cagatay and Berik (1990)	Turkey, plant-level data (manufacturing), 1966-1982/85	Female share of employment (industry level)	Export-orientation, skill-intensity, labor-intensity (plant-level)	Pooled OLS	Economic policy regime	Export orientation increases female employment
Cagatay and Özler (1995)	96 countries, 1985-1990	Female share of the labor force	Exports/GDP, Participation in structural adjustment programs (country-level)	Pooled OLS	--	Exports have a negative effect on FLFP (but sometimes insignificant), interaction between structural adjustment and exports has a positive effect on FLFP
Chamarbagwala (2006)	India, household survey data, 1983/94-1999/2000	Employment rate (at the level of demographic groups)	Net imports/Output (industry-level)	Decomposition (between and within industry shifts)	Sector and education	Trade liberalization increased the demand for skilled labor; trade in manufacturing has a negative impact on demand for female labor, but trade in services generated demand for female college graduates
Dell (2005)	Mexico, employment survey, 1987-1999	FLFP (state level)	Imports, Exports, FDI (industry-level)	Difference-in-difference	--	Trade liberalization increased FLFP in Central Mexico, no separate effect of FDI (but difficult to disentangle)
Ederington, Minier and Troske (2010)	Colombia, plant-level data (manufacturing), 1984-1991	Female share of employment (plant-level)	Tariffs (industry-level)	OLS, logit (with tariff reductions as regressors)	Plant characterist ics	Trade liberalization increased female employment
Gaddis and Pieters (2012)	Brazil, labor force survey data, 1987-1996	Women's labor force participation and employment decision	Tariffs (industry-level)	Fixed effects, pooled OLS	Education, ethnic group, sector	Trade liberalization increased female labor force participation and employment with a lag of around 2 years (mostly in the service sectors)

Gray, Kittilson and Sandholtz (2006)	180 countries (high income and developing), 1975-2000	Female share of the labor force	Trade/GDP, FDI/GFCF* (country-level)	FE	--	Trade and FDI come out insignificant
Hyder and Behrman (2011)	Pakistan, historical census data and labor force survey data, 1951-2008	LFP gap (f-m)	Trade/GDP		--	Trade openness reduced the gap between male and female LFP
Meyer (2006)	120 countries, 1971-1995	FLFP	Trade/GDP, Exports/GDP, Trade volatility (in TOT), Commodity concentration, and a trade openness index (based on factor analysis), FDI/GDP	OLS (static and dynamic)	Income level and region	Positive effects of trade openness on FLFP in the static model and negative effects in the dynamic model, results differ by region and income-level (pos. effect in MICS), FDI is insignificant in the static model but has a positive effect in the dynamic model
Özler (2000)	Turkey, plant-level data, 1983-1985	Decision to employ females and female share of employment (plant level)	Export-orientation, skill-intensity (plant-level)	OLS (on averages)	Plant characteristics	Export-orientation increases the likelihood to employ females and the female share of employment
Pradhan (2006)	India, plant-level data (manufacturing), 1999/2000-2001/2002	Employment gap (f-m)	Imports, Exports, In-house R&D, Foreign technology imports, Capital-intensity, FDI (plant-level)	Pooled OLS	--	Trade (via exports) increases female employment, technology upgrades are linked to lower female employment, FDI has an insignificant effect
Siddiqui (2009)	Pakistan, 1990	FLFP	Average tariffs (industry-level)	CGE Model	Skilled vs. unskilled	Trade liberalization leads to higher FLFP (mainly unskilled women)
Siegmann (2007)	Indonesia, household and plant survey data, 1999-2002	Female employment share	Foreign capital in a firm's total capital stock	OLS and qual. focus group discussions	Sector	Qualitative interviews show positive effects of FDI on female employment, quantitative analyses show mixed results (negative effects in manufacturing/hotels)
Terra, Bucheli, Estrades (2007)	Uruguay, 2000	Female employment	Tariffs (by sector)	CGE Model	Skilled vs. unskilled	Trade liberalization has a positive effect on female employment (skilled women faring better)
Wood (1991)	52 countries (high income and developing), 1960-1985	Female share in manufacturing employment	Manufacturing export ration, Import penetration	Descriptive statistics, scatter plots (first differences)	High income vs. developing	North-South trade has increased the demand for female labor in the manufacturing sector in developing countries

* GFCF=gross fixed capital formation

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