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ABSTRACT

Globalization has for decades been associated with a rise in the female share of employment or feminization. This study finds that since the mid 1980s, export growth in developing countries is associated with feminization in some countries and a defeminization in others. Focusing on Southeast Asia and Latin America, it uses a fixed-effects econometric model to test whether the technological conditions of production (labor or capital intensity) rather than export growth account for shifts in the female share of employment in manufacturing. It finds that the capital intensity of production, evidenced by shifts in labor productivity, is negatively and significantly related to shifts in the female share of employment in manufacturing, while exports are statistically insignificant. The study concludes that an anti-female bias exists in labor demand changes that result from output or employment shifts in developing countries when manufacturing becomes more capital intensive, a process likely related to industrial upgrading.

KEYWORDS

Feminization of the labor force, gender segmentation, globalization, employment, upgrading, defeminization, manufacturing

JEL Codes: O1, F16, B54

INTRODUCTION

The link between international trade expansion and the feminization of labor is a historical one.[1] The unprecedented mobilization of women workers in export-related production in manufacturing in developing countries in the 1960s and 70s, particularly evident in the high share of female employment in export-processing zones, spawned an entire literature that attempted to explain the phenomenon. It was argued that globalization led to the feminization of labor because export growth exposed firms to greater international competition and raised the demand

for women's labor due to their lower wages and presumed disinclination to join labor unions (Diane Elson and Ruth Pearson 1981). Thus, women served as a source of competitive advantage for firms in the export market. In fact, Guy Standing (1989, 1999) argued that trade openness and rising international competition had led to a "global feminization of labor" in which women were being substituted for men across employment categories as they provided cheap and flexible labor.

The view that export growth is associated with a feminization of labor has been quite influential, yet there are a number of reasons to reexamine this stylized fact. First, developing countries have experienced a broad-based and massive rise in exports (as a percentage of GDP), but they have undergone very different degrees of change in the female intensity of employment. Second, country-level evidence (for instance in the East Asian first-tier newly industrializing countries [NICs]) shows that industrial upgrading (making products with higher technological content or value added) corresponds to a fall in the female share of employment, despite continued success in exports. And finally, as women have rapidly closed the education gap at the primary and secondary level, there is perhaps less reason to expect the "feminization" process to apply to women workers any more than men workers.

In this paper, we revisit the feminization literature to examine both its theoretical and empirical foundations. We inquire whether there has been a global feminization of manufacturing labor over time using an International Labour Organization dataset on gender-disaggregated employment in sixty-two high- and middle-income countries (ILO 2009). Focusing on Latin America and Southeast Asia in particular – regions that display contrasting trends in the female share of employment in manufacturing over time – we examine whether changes in manufacturing export share account for these shifts using a fixed-effects econometric model. We find that the technological conditions of production, as evidenced by shifts in labor productivity, are more important in the (de)feminization of manufacturing employment than changes in manufacturing export share *per se*. We conclude there is an anti-female bias in labor demand changes when the labor or capital intensity of manufacturing production shifts, a process that may be related to industrial upgrading.

RECENT TRENDS IN THE FEMALE INTENSITY OF MANUFACTURING EMPLOYMENT

We present here recent trends in the female share of manufacturing employment using the ILO's LABORSTA series on "total employment" (ILO 2009). The female share of manufacturing employment in middle-income countries rose steadily over the period 1985–2007, while

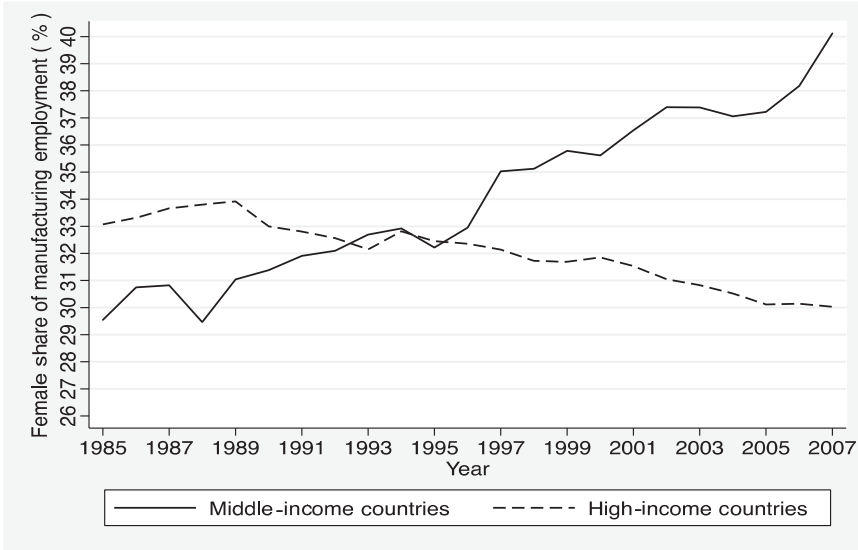

Figure 1 Average female share of manufacturing employment for high- and middle-income countries, 1985–2007
Note: See Appendix A for the countries in each group and Appendix B for data availability.
Source: Authors' illustration based on ILO (2009).

high-income countries, which started out with a higher level of women's employment, experienced a decline. These opposite trends are visible in Figure 1.

While Latin American and Caribbean and South Asian countries have continued to experience a rising female share of manufacturing employment into the twenty-first century, the latter from a relatively low base, East Asian and Pacific middle-income countries have experienced a defeminization, as have Western Europe and other industrialized countries (Table 1). Note that East Asia is defeminizing from a relatively high share of women's employment compared to Western Europe and other industrialized countries.

Middle-income developing countries expanded their share of world exports of manufacturing from 13 percent in 1981 to 27 percent in 2005, the same period in which the female share of employment in middle-income developing countries was rising. This would seem to indicate that Standing's (1989) argument about the "global feminization of labor" remains operative into the twenty-first century. However, among middle-income countries, the simple OLS regression line between the average rate of growth of manufacturing exports in Figure 2 is mildly positive but statistically insignificant. Changes in national manufacturing export growth

Table 1 Female share of manufacturing employment by region, 1985–2007

	1985–95		*1996–2007*		*1985–2007*	
Region	*Average*	*Growth*[a]	*Average*	*Growth*[a]	*Average*	*Growth*[a]
East Asia and Pacific	43.17	0.32	39.52	− 0.79	41.84	− 0.12
Latin America and Caribbean	29.54	0.88	37.93	1.79	32.08	1.65
Other industrialized countries	31.76	− 0.2	29.73	− 0.52	31.21	− 0.31
Europe and Central Asia			37.54	1.24	37.54	1.24
Western Europe	28.54	0.12	27.78	− 0.24	28.45	− 0.09
Middle East and North Africa	21.03	4.46	16.74	− 2.04	19.76	0.28
South Asia	10.65	2.6	17.43	3.74	13.06	3.04

Notes: Data availability varies by country; see Appendix A. See Appendix B for countries in each region. [a]Average of Annuals.
Source: ILO (2009).

shares from 1985–2007 were associated with a broad range of changes in the female share of employment. Thus the stylized fact that globalization is associated with a feminization of labor is not generally borne out, and the "cloud" pattern in Figure 2 suggests that that changes in export orientation alone are inadequate as a general explanation of trends.[2]

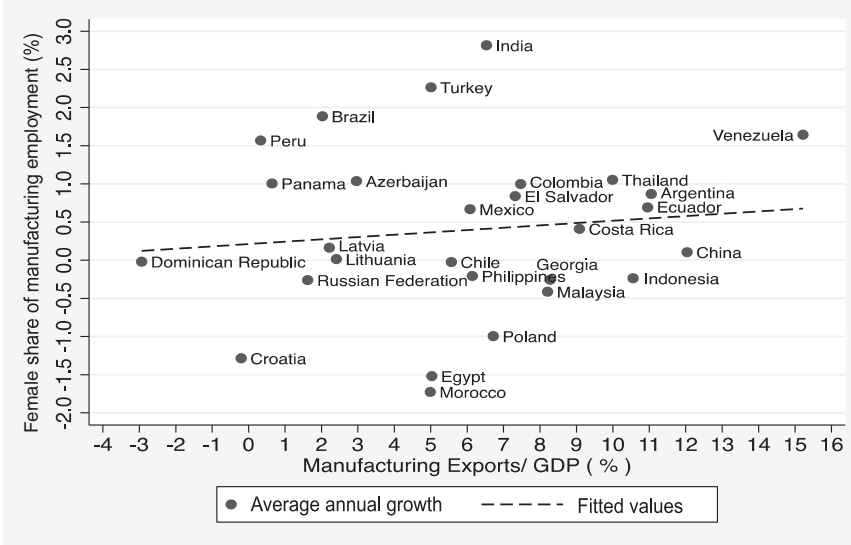

Figure 2 Female share of manufacturing employment and exports, middle-income countries, 1985–2007
Notes: Fitted Line: Y= 0.21 + 0.03X (t-stat 0.61; Adj Rsq -0.02). Data availability varies by country. See Appendix B.
Sources: Authors' illustration based on ILO (2009) and World Bank (2009).

In this paper, we focus on developing countries in Southeast Asia and Latin America, regions that display contrasting trends in feminization over the same period. We select these regions for several reasons: one, they have near continuous data for a considerable period, unlike Central and Eastern Europe; two, the data are also regionally complete (unlike South Asia);[3] three, they represent developing areas – unlike East Asia, where countries such as South Korea, Hong Kong, Singapore, and Japan have transitioned to "developed status"; and four, these regions display contrasting trends in feminization so a hypothesis that accounts for this variation has added explanatory potential.

The contrasting trends in the female share of employment in Southeast Asia and Latin America can be seen in Figure 3: the former shows a slight defeminization (which is greater when Thailand is excluded) while the female share of employment has increased rapidly in the latter.[4] Figure 4 displays the female share of manufacturing employment in Latin America and Southeast Asia by country. A few points are noteworthy: levels of the female share of employment in manufacturing in most of Latin America are lower than those in Southeast Asia (last row of figure), with the exceptions of Colombia, Mexico, and El Salvador. Of the larger Latin American countries in our sample–Brazil, Mexico, Argentina, Venezuela, Colombia, Peru, and Chile–all except Peru and Chile feminized relatively more rapidly than the smaller countries.

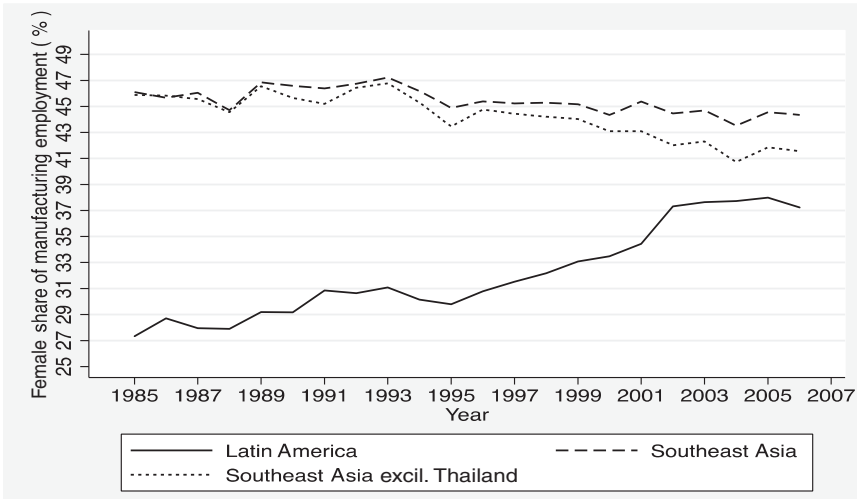

Figure 3 Female share of manufacturing employment, Southeast Asian and Latin American middle-income countries, 1985–2007
Note: Data availability varies by country; see Appendix B.
Source: Authors' illustration based on ILO (2009).

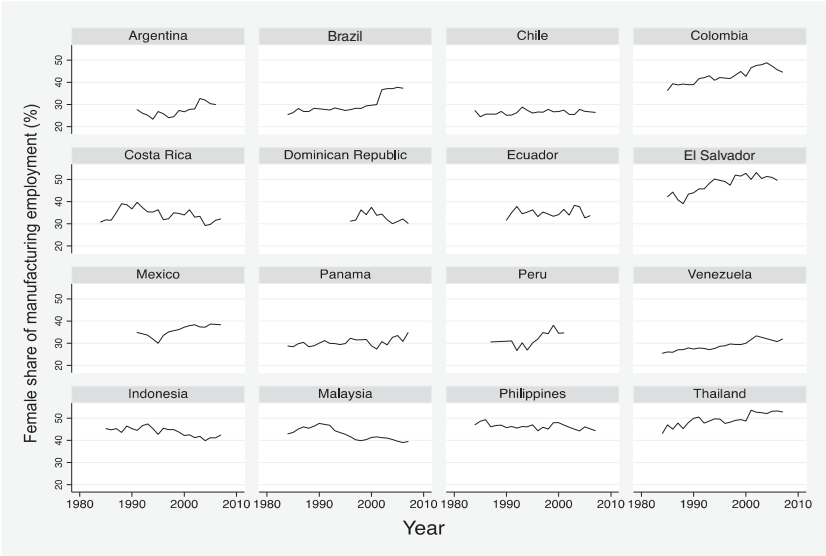

Figure 4 Female share of manufacturing employment, Latin America and Southeast Asia
Source: Authors' illustration based on ILO (2009).

ECONOMIC THEORIES OF FEMINIZATION: TRADE OPENNESS, GENDER WAGE GAP, AND TECHNOLOGICAL CONDITIONS OF PRODUCTION

Trade openness

Why is globalization associated with a rising female share of employment in the literature? The main explanation lies in the heightened competitive pressures of exporting and thus the need to use cheap and flexible labor as much as possible. There are orthodox and heterodox economic models of this, but both predict that in the presence of a gender wage gap, greater trade openness will raise the female share of employment.

The orthodox explanation for the link between trade and the rising female share of employment is based on the Stolper–Samuelson theorem of the Heckscher–Ohlin theory of international trade. In this model, trade liberalization between developed (relatively high-skill abundant) and developing countries (relatively low-skill abundant) benefits the relatively abundant factor in that country. If it is assumed that women are relatively low skilled,[5] then the lifting of trade barriers should increase the demand for women's labor in developing countries, leading to feminization and a rise in women's relative wages.[6] The heterodox explanation is based on the theory of competitive (that is, absolute) advantage of trade in which

firms compete for export market share on the basis of unit costs and prefer women's labor because it is relatively cheaper owing to the gender wage gap (Stephanie Seguino 1997, 2000; Diane Elson, Caren Grown, and Nilüfer Çagatay 2007).

Overall, the empirical evidence suggests that trade expansion has led to a higher demand for women's labor in developing countries, although findings differ by sector of economic activity, workers' skill level, and country.[7] The focus of this paper is on the effects of export expansion on manufacturing employment, though a number of studies also examine the relationship between import liberalization and women's employment.[8]

Standing (1989, 1999) attributes "global feminization" to employer attempts to lower labor costs but also to raise the flexibility of hiring and firing in response to fluctuations in product demand and minimize the collective bargaining power of workers on issues of overtime, workplace safety, and pay. Standing predicts the feminization of labor will continue as a secular long-term trend due to the structural factors of competition and labor market deregulation. As in the case of middle-income countries in Figure 2, however, a scatterplot of the growth of manufacturing export share and the female share of employment in Southeast Asia and Latin America does not reveal any pattern in our sample,[9] and the linear fitted line is statistically insignificant. Manufacturing exports in most countries in our sample grew rapidly, but these were associated with both negative and positive rates of feminization on average.

Gender wage gap

In the literature, the gender wage gap is the link between globalization and the feminization of labor. Assuming a downsloping labor demand curve, a closing gender wage gap would be associated with a decline in the female share of employment, or at least with a slowing of the rate of feminization of manufacturing employment. There is also evidence that as the labor market tightens and women organize for better pay, they become a less attractive workforce for employers (Jayati Ghosh 2002).

While there is a vast amount of research on trade and the gender wage gap,[10] there is scant evidence on the relation between the gender wage gap and the female share of employment.[11] Do movements in the wage gap contribute to the feminization of manufacturing employment in Latin America and the defeminization observed in Southeast Asia? Because the international comparability of wage data is problematic,[12] we use the ratio of women's to men's wages though data availability remains a problem. In all of the countries for which we have data, the gender wage gap has closed due to the upward harmonization of men's and women's wages, rather than a decline in men's wages. As evident in Figure 5, the correlation between the gender wage gap and female share of employment over time does not

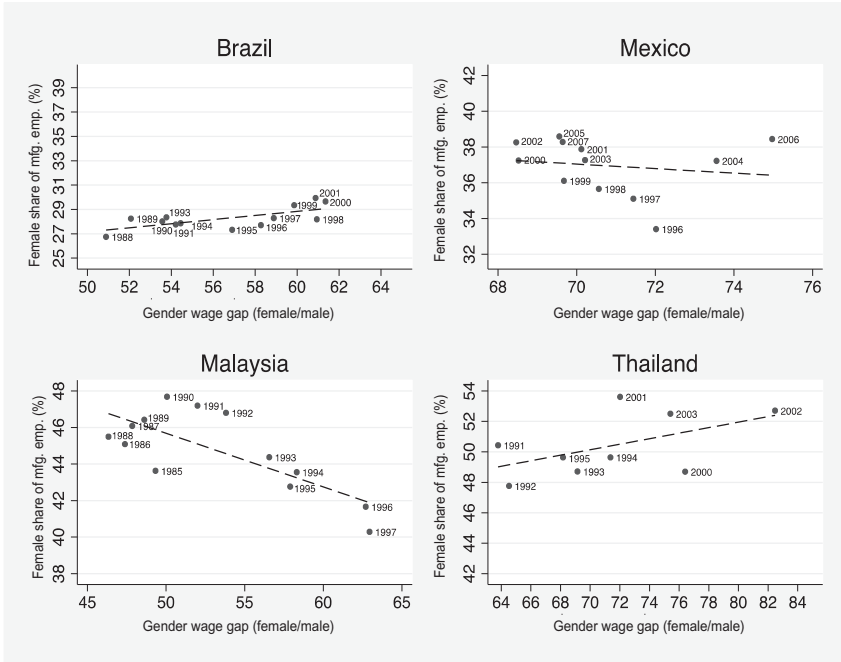

Figure 5 Female share of manufacturing employment and the gender wage gap
Sources: Authors' illustration based on ILO (2009) and World Bank (2009).

show any consistent pattern across the countries in our sample. In Brazil and Thailand, a narrowing wage gap is associated with a rising female share of employment for the years 1988–2002 and 1991–2002, respectively. In Malaysia and Mexico, on the other hand, the female share of employment rises as the gender wage gap closes. Costa Rica, El Salvador, Indonesia, and the Philippines, other countries for which wage data are readily available, show no clear relationship. Even as women's wages rose relative to men's wages over time, this was associated with both higher and lower demand for labor in different countries. While these outcomes can each be given an *ex post* rationale in terms of shifts in relative (female-to-male) labor supply and demand, there appears to be no cross-country regularity to the pattern. The gender wage gap is clearly an important factor in the feminization of labor, though there are other forces at work in this process that warrant examination.

Technological conditions of production

The feminist literature has noted an additional aspect that characterized the feminization of labor: it took place almost entirely in labor-intensive industries such as textiles, garments, and electronics and not generally

in manufacturing.[13] Why was this? In addition to being relatively cheap to employ, women were believed to possess gender specific skills and "attributes" such as dexterity, docility, submissiveness, and reluctance to join unions, which made them suitable for certain labor-intensive activities (Elson and Pearson 1981). In other words, gender-typing these jobs as "feminine" (in contrast to more heavy "masculine" work) facilitated the segmentation of women into low-paying and low-value-added jobs in manufacturing. Leslie Salzinger (2003) argues that this trope of "feminine productivity" in labor-intensive work was deliberately constructed to serve productive interests in the factory while the earlier international division of labor literature situated women's perceived suitability for certain activities in the gender division of labor in the household (M. Patricia Fernández-Kelly 1989). In addition to gender typing, sex segmentation in manufacturing has been linked to norms that assign men with breadwinner status and ration higher-paying jobs to them, to barriers to entry as a result of male-dominated unions or government policy, and to pre-market discrimination in education and training.[14]

We do not attempt in this paper to disentangle the reasons for the sex segmentation of labor, but we do test whether the technological conditions of production influence movements in the female share

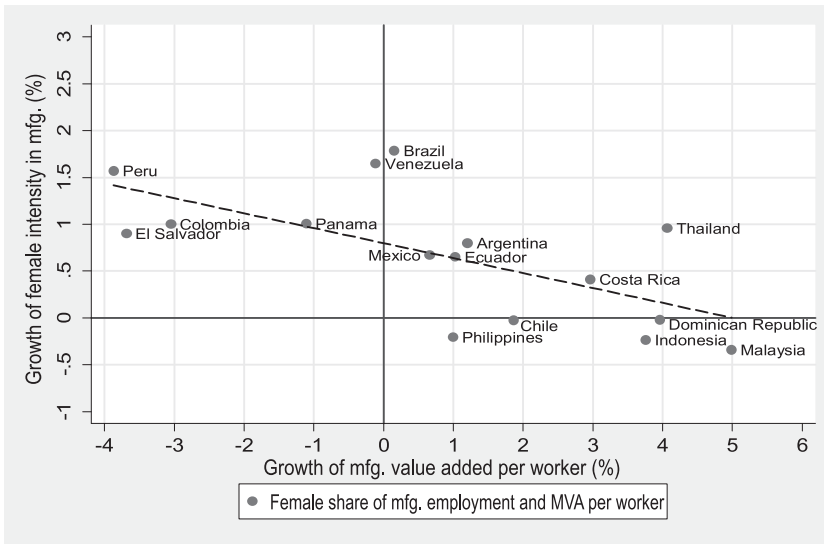

Figure 6 Female intensity of manufacturing, employment, and manufacturing value added per worker, average annual growth, 1985–2007
Notes: Fitted Line: Y = 0.86–0.13X (Adj. R^2 = 0.24; t-stat = -2.38). Data availability varies by country. Please see Appendix B.
Sources: Authors' illustration based on ILO (2009) and World Bank (2009).

of employment in manufacturing. We find that the growth of labor productivity in manufacturing, as measured by manufacturing value added per manufacturing worker, is negatively related to the growth of the female share of employment as shown in Figure 6.

This negative relation not only implies that women are preferred for labor-intensive work but also that they lose out when production becomes more capital intensive or when industries upgrade their products or processes. This result is surprising considering that women have rapidly closed the education gap at the primary, secondary, and tertiary levels in both the regions under consideration (see Table 2). Women's achievement in terms of schooling years is almost at par with or in some cases even exceeds men's achievement; at the tertiary level, women's enrollment generally exceeds that of men, particularly in Latin America.[15] But defeminization may take place for reasons related to the causes that led to preference for women's labor in the first place. First, as labor costs make up a smaller proportion of total cost in capital-intensive production, the incentive to hire relatively cheaper women's labor might disappear (Stephanie Seguino 2005); second, gender norms designate heavy or technologically sophisticated work as "masculine" and thus preclude hiring

Table 2 Ratio of mean schooling years (female to male), Southeast Asia and Latin America

	1980	*1985*	*1990*	*1995*	*2000*	*2005*	*2010*
Southeast Asia							
Indonesia	0.66	0.68	0.72	0.77	0.85	0.87	0.89
Malaysia	0.76	0.80	0.79	0.89	0.91	0.93	0.96
Philippines	0.98	1.00	1.02	1.02	1.04	1.06	1.07
Thailand	0.80	0.85	0.88	0.88	0.90	0.92	0.98
Latin America							
Argentina	0.99	1.01	1.02	1.03	1.02	1.00	1.01
Brazil	1.00	1.03	1.06	1.06	1.05	1.03	1.06
Chile	0.97	0.98	0.98	0.99	0.96	0.99	0.97
Colombia	0.97	0.97	0.98	0.99	1.00	0.97	0.99
Mexico	0.85	0.88	0.92	0.93	0.93	0.93	0.97
Peru	0.79	0.85	0.87	0.88	0.89	0.90	0.90
Venezuela	0.94	0.96	0.99	1.01	1.03	1.05	1.07
Costa Rica	0.99	1.00	1.00	1.00	1.01	0.98	1.01
DR	0.92	0.99	1.07	1.11	1.16	1.12	1.08
Ecuador	0.92	0.92	0.93	0.96	0.97	0.98	0.99
El Salvador	0.87	0.87	0.90	0.91	0.90	0.88	0.95
Panama	1.01	1.02	1.01	1.02	1.02	1.04	1.04

Source: Robert J. Barro and Jong Wha Lee (2010).

women for such work (Teri L. Caraway 2007); third, women lack access to on the job training that allows them to build new skills (Daphne Jayasinghe 2001); and fourth, as women begin to organize for better pay and working conditions, they become a less attractive workforce for employers (Ghosh 2002).

A number of authors have made the case that the shift to more capital-intensive production leads to defeminization, including David Kucera and Sheba Tejani (2014) for Malaysia, South Korea, and Taiwan, Kwame Sundaram Jomo (2009) for East Asia, Caraway (2007) for East Asia and Latin America, Jayasinghe (2001) for the Caribbean, Elizabeth Fussell (2000) for Mexico, Günseli Berik (2000) for Taiwan, and T.H. Kim and K.H. Kim (1995) for South Korea. Nilüfer Çağatay and Şule Özler (1995) and Şule Özler (2000) find that export orientation and the technological characteristics of production can explain feminization in Turkey. Josh Ederington, Jenny Minier, and Kenneth R. Troske (2009) report similar findings for Colombia.

FIXED-EFFECTS MODEL ESTIMATION

We now conduct multiple regression analysis to assess if the negative relationship between the technological conditions of production (measured as manufacturing labor productivity or value added per worker) and the female share of employment in manufacturing holds in the presence of controls. We use a fixed-effects model that allows us to control for the time-invariant factors in each country that might affect the dependent variable and bias the predictors of the model in either direction. Fixed effects transform the data using a time-demeaning process so that resulting observations capture the difference between each original observation of a particular variable and its mean across a group (Jeffrey M. Wooldridge 2005). In addition, we also control for other variables that might influence the female share of employment drawing on the theoretical and empirical literature and including a country's level of development, proxied by GDP per capita, the share of manufacturing exports to GDP, the share of services in GDP, the labor force participation ratio, and the gender education gap.[16] The gender wage gap variable could not be included as both data availability and quality pose problems, though the gender education gap may be alternatively interpreted as a proxy. The data are pooled across annual observations for the sample of sixteen countries in Southeast Asia and Latin America for the period 1985–2007. Variables are in log form so that the coefficients can be interpreted as elasticities.

The baseline equation we estimate is as follows:

$$\ln(FS)_{it} = \beta_0 + \beta_1.\ln(ExpShare)_{it} + \beta_2.\ln(Prod)_{it} + \beta_3.\ln(GDPpc)_{it} + \beta_4.\ln(SvcShare)_{it} + \beta_5.\ln(Educ)_{it} + \beta_6.\ln(LFratio)_{it}$$

where the subscript i stands for country and t for time

FS = Female share of manufacturing employment
ExpShare = Share of manufacturing exports to GDP
Prod = Manufacturing labor productivity (Mfg. value added / Total mfg. employment)
GDPpc = GDP per capita (constant 2005 PPP dollars)
SvcShare = Share of services value added in GDP
Educ = Average schooling years (female–male)
LFRatio = Labor force participation rate (female–male)

The dependent variable is the female share of total employment in manufacturing and the main variable of interest is manufacturing labor productivity. We expect that the coefficient on manufacturing labor productivity will be negatively related to the female share of employment while that on manufacturing export share may be positive, negative, or insignificant, as illustrated previously. As the structural composition of economies shifts toward services, and a greater proportion of women tend to be employed in services in general, the coefficient on *SvcShare* is likely to be negative. According to standard economic analysis, all of the other control variables – income, education, and labor force participation ratios – are expected to positively influence the female share of employment by affecting the demand or supply for women's labor. A higher level of economic development (proxied by income) is generally associated with a higher share of female employment. Closing of the gender education gap is expected to increase the supply and demand for women's labor. However, as a proxy for the gender wage gap, the gender education gap is expected to have a negative coefficient if we assume a downsloping labor demand curve. Since more women are available for work with a rise in the labor participation ratio, its coefficient is expected to be positive. Undoubtedly, since we estimate our model at the macroeconomic level and use broad indicators of economic activity, our estimation will provide crude, yet we believe revealing, results of the general forces at work.

Identification issues

It is conceivable that the direction of causality between the dependent and independent variables could be reversed or that some of the relationships are determined simultaneously, implying that an endogeneity problem may cause OLS estimates of the parameters to be inconsistent. For instance, as manufacturing exports grow and competition intensifies, firms could hire women to lower labor costs – though, ostensibly, a higher female share of employment can itself stimulate export growth if firms can keep labor costs down and become more competitive (Seguino 1997, 2000). The same

argument can be made with respect to GDP per capita: that is, higher income growth draws more women into the workforce and conversely, a higher share of women's employment could itself stimulate income growth. With respect to manufacturing productivity, human capital theory suggests that women might themselves choose low productivity employment in order to attenuate the effects of their intermittent participation in the labor market (Solomon W. Polachek 1981), which would reverse the causality between the two variables. In terms of compositional effects, it is conceivable that a lower share of female employment in manufacturing could release more women for employment in the services sector. With the labor force participation ratio and mean schooling years regressors, there may be feedback effects at work: the greater likelihood of being employed, as demonstrated in a higher female share of employment, may incentivize more women to enter the labor force and motivate higher school enrollment and achievement. We thus conduct an instrumental variables regression in order to test for the exogeneity of the regressors in our model.

Since we use macro-level variables for a cross-country sample, finding suitable instruments can be tricky. In this case, lagged values of the explanatory variables can serve as instruments for they will be correlated with the explanatory variable but not with the error term at time t since they were generated at an earlier time (Wooldridge 2005).[17] We test for the exogeneity of all the regressors in our model by using a two-stage Generalized Method of Moments (GMM) instrumental variables approach. A two-stage GMM estimator is more efficient than a traditional two-stage least-squares estimator because it employs an optimal weighting matrix and relaxes the assumption that the error terms are independent and identically distributed.[18] We test for the validity of our instruments by running Hansen's overidentification test in which the joint null hypothesis is that the instruments are valid. The reported p-value of the test is 0.4280, and we fail to reject the null hypothesis implying that our instruments are valid. We then conduct the C-statistic type test (Fumio Hayashi 2000), to test for the endogeneity of the regressors. Our estimates are efficient for heteroskedasticity, autocorrelation, and cross-sectional dependence, and the resulting statistics are correspondingly robust to all effects. The null hypothesis is that the relevant endogenous regressors can be treated as exogenous. We fail to reject the null hypothesis (the reported p-value is 0.5775) and confirm that our regressors are indeed exogenous and that OLS estimates of the parameters are consistent.

Discussion of results

Having confirmed the exogeneity of the regressors in our model, we now present the results of our estimations. We report the results of both

fixed- and random-effects models as the Hausman specification test, which determines whether fixed or random effects are efficient and consistent estimators of the true parameters of our model, suggests that random effects should be used. But group effects are highly significant jointly when added to the model (Wald test), and a fixed-effects model is preferred because it is less restrictive than random effects and allows for arbitrary correlation between the unobserved effect and the explanatory variables. Table 3 presents the baseline OLS, fixed-effects, and random-effects results.

The OLS model accounts for 73 percent of the changes in the female share of employment in manufacturing. The coefficient on manufacturing export share is positive and significant in all of the models although its impact is relatively small. The coefficient on manufacturing productivity is negative and highly significant in all specifications in economic and statistical terms so that a 10 percent rise in productivity leads to more than a 2 percent decline in the female share of employment, *ceteris paribus*. In terms of the other variables, the level of development matters and has a positive and statistically significant effect on the female share of employment (except in the OLS model) as does the labor force

Table 3 Baseline estimations, Southeast Asia and Latin America, 1985–2007

	OLS		*Fixed effects*		*Random effects*	
Independent variables	*b/se*	*t/p*	*b/se*	*t/p*	*b/se*	*t/p*
Mfg. exports/GDP	0.083***	13.93	0.019**	2.1	0.028***	3.29
	(0.006)	0	(0.009)	0.04	(0.009)	0
Mfg. productivity	− 0.145***	− 7.64	− 0.208***	− 10.66	− 0.207***	− 10.82
	(0.019)	0	(0.019)	0	(0.019)	0
GDP per capita	− 0.046**	− 2.01	0.091***	3.27	0.069***	2.63
	(0.023)	0.04	(0.028)	0	(0.026)	0.01
Svc/GDP	0.007	0.15	− 0.196***	− 3.99	− 0.205***	− 4.28
	(0.047)	0.88	(0.049)	0	(0.048)	0
Labor force participation (f–m)	0.317***	8.47	0.231***	5.64	0.242***	6.1
	(0.037)	0	(0.041)	0	(0.04)	0
Avg. years schooling (f–m)	− 0.160**	− 2.43	0.044	1.02	0.045	1.04
	(0.066)	0.02	(0.043)	0.31	(0.043)	0.3
Constant	5.316***	27.93	5.606***	18	5.802***	20.3
	(0.19)	0	(0.311)	0	(0.286)	0
R^2 within			0.389		0.386	
R^2 between			0.585		0.631	
R^2 overall	0.733		0.59		0.632	
Observations	309		309		309	
Countries	16		16		16	

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

participation ratio. The structural shift of economies toward services also has a negative impact on the female share of manufacturing employment possibly due to the high demand for women's labor in some service industries. The gender education gap, however, remains statistically insignificant in all specifications, highlighting that basic education might not be an important factor in securing higher employment for women, though the particular field of specialization might be important, as we discuss later. Alternatively interpreted as a proxy for the gender wage gap, this result is in line with our previous finding that the female share of employment has no definite relationship with the gender wage gap.

We run additional diagnostics to assess the efficacy of the baseline fixed-effects model. A modified Wald test for fixed effects confirms the existence of heteroskedasticity in the model. We also find evidence of autocorrelation using the Wooldridge test for autocorrelation in panel data and cross-sectional dependence across entities using Pesaran's test. Thus, we use Driscoll–Kraay standard errors that are robust to heteroskedasticity, autocorrelation, and possible cross-sectional dependence in the estimation (Daniel Hoechle 2007). We also control for time trends in our model by adding time effects and retain them in the final estimation, as they are highly significant jointly.

We test for nonlinearities in the data by running the regression with three additional variables: quadratic terms for (the natural log of) manufacturing labor productivity, the share of manufacturing exports in GDP, and GDP per capita. It is possible that at lower levels of manufacturing productivity, the relationship with female share is positive, which becomes negative after a certain threshold is crossed. The quadratic terms for the share of manufacturing export share and GDP per capita also test for increasing or decreasing marginal effects of each variable on the female share of employment. All three variables do not have additional explanatory power and are not retained in the final estimates as they are individually and jointly insignificant – possibly because our data capture the beginning of the trends of defeminization in Southeast Asia, rather than the process of feminization that preceded it, and trends of feminization in Latin America are mostly linear. In the absence of time-use survey data in many developing countries (Debbie Budlender 2008), we also test the inclusion of the age dependency ratio (ADR) – dependents younger than 15 and older than 64 years as a percentage of the working age population – to capture any negative effects of the size of caring labor that women disproportionately bear due to extant gender norms. The coefficient is statistically insignificant (p-value 0.353); a likelihood ratio test in which the null hypothesis is that the restricted model is a better fit cannot be rejected (p-value 0.287), and the variable is not retained in the final estimates.

Table 4 presents the new results, which remain broadly similar except that manufacturing export share becomes statistically insignificant after

Table 4 Final fixed-effects estimations, Southeast Asia and Latin America, 1985–2007

	Model I		*Model II*	
	(Driscoll s.e.)		*(Driscoll s.e.)*	
Independent variables	b/se	t/p	b/se	t/p
Mfg. exports/GDP	0.019*	1.96	0.011	0.86
	(0.01)	0.07	(0.014)	0.43
Mfg. productivity	− 0.208***	− 13.42	− 0.208***	− 12.26
	(0.016)	0	(0.018)	0
GDP per capita	0.091***	4.88	0.110**	2.77
	(0.019)	0	(0.042)	0.02
Svc./GDP	− 0.196**	− 2.58	− 0.200**	− 2.4
	(0.079)	0.02	(0.089)	0.04
Labor force participation (f–m)	0.231***	6.7	0.213***	5.07
	(0.036)	0	(0.045)	0
Avg. years schooling (f–m)	0.044	1.69	0.050*	1.85
	(0.027)	0.12	(0.029)	0.1
Constant	5.606***	13.22	5.445***	10.05
	0.438	0	0.581	0
Fixed effects	*Yes*		*Yes*	
Time effects	*No*		*Yes*	
R^2.w	0.388		0.417	
Observations	309		309	
Countries	16		16	

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

adding time effects.[19] The education variable is borderline significant at the 10 percent level after the addition of time effects while manufacturing productivity retains its strongly negative relationship to the female share of employment, which suggests that women remain segmented into labor-intensive activities in manufacturing. When production becomes more capital intensive, defeminization sets in: there may be one or more causes operating to produce the given outcome in a country though the relationship holds across the sample.

Other supply-side factors

We consider here some additional factors related to education and labor force participation that may be contributing to our results: gender segmentation in education and gender differences in domestic work burdens that are themselves products of gender binaries and discrimination.

Although women's educational achievements have nearly equaled and sometimes exceeded those of men in both regions, our results suggest they do not significantly contribute to a higher share of female employment in manufacturing. Nevertheless, gender segmentation in fields of specialization in post-secondary and higher education can place men in a more advantageous position vis-à-vis women when the nature of labor demand changes under more technologically advanced production regimes. It is thus worthwhile to consider more carefully the differences in the kind of education men and women receive.

Women comprised less than a quarter of students in the field of engineering, manufacturing, and construction, one-third of the students in agriculture and science, but two-thirds of the students in education and health and welfare in higher education institutions in 2005 worldwide (United Nations Educational, Scientific and Cultural Organization [UNESCO] 2008; Carole Leathwood and Barbara Read 2008). Education remains the field in which the most number of women are concentrated in nearly all regions of the world. Maria Charles and Karen Bradley (2009) report similar findings for a set of forty-four developed and developing countries in the mid 1990s: women were overwhelmingly underrepresented in the fields of engineering, math, and natural sciences, and overrepresented in health and humanities across the board. Indonesia, and particularly Colombia, display a low level of sex segregation in education, while Malaysia, Chile, and the Philippines – other countries in our sample – appear to reflect the general trends.

The accommodation of "feminine aptitudes" through the creation of vocational and two-year degree programs in subjects such as secretarial and library studies, early childhood education, healthcare, and tourism has tended to especially increase sex segregation by field of study (Maria Charles and Karen Bradley 2002; 2009: 932). These programs have been an integral component of the expansion, modernization, and diversification of higher education in both developed and developing countries, processes that have "been motivated historically by efforts to create feminine enclaves" within higher education (Charles and Bradley 2009: 932).

This pervasive humanistic/technical gender divide in educational fields has been explained variously by the highly gendered structures and practices of university systems (Leathwood and Read 2008); women's preference for fields that hew closely to traditional domestic roles; and structural shifts in post-industrial labor markets that reinforce "gender essentialist ideologies" (Charles and Bradley 2009: 925; Carlo Barone 2011). Finally, it is important to note that the returns to these "feminine" fields of study tend to be much lower in general though a number of scholars have suggested that feminization itself devalues a particular field of

study and brings down the remuneration associated with it (Donna Bobbitt-Zeher 2007; Theodore P. Gerber and Sin Yi Cheung 2008; Leathwood and Read 2008).

Gender differences in domestic work burdens

In our empirical model, we did not find evidence for the inclusion of the ADR (as a proxy for caring labor) perhaps because it is a channel through which the labor force participation ratio varies, a factor already accounted for in our analysis. Here we consider in more detail how gender differences in domestic work burdens in the regions we study impact women's participation in the labor force.

A study of time-use surveys in six developing countries found that women spend much less time on paid work than men while they spend twice the mean time on unpaid care work, including house work and person care, than do men (Shahara Razavi and Silke Staab 2008). In Mexico and Costa Rica women spend more than six hours a day, and in Ecuador five hours a day, on unpaid work as compared to one and a half hours spent by men (CEPAL 2009). As CEPAL notes:

> All of the data suggest that social inequalities in Latin America are closely linked to, and are reproduced in part because of, unequal availability of or access to family and social care options, and to the effect of these inequalities on women's differential ability to enter the labour market. This situation gives rise to a vicious cycle. Indeed, the dynamics of women's participation in the labour market and the stratification thereof are strong drivers of the reproduction of socio-economic inequality.(2009: 168)

Though data on Southeast Asia are sparse, the situation appears to be quite similar: in Thailand, 58 percent of women participants in a time-use survey in 2001 spent two hours or more in the day doing household maintenance activities, versus 21 percent of men (National Statistics Office [NSO] 2001). In the Philippines, the distribution of household work by gender hardly shifted through the 1990s: women undertook approximately 90 percent of the total hours of unpaid household work, and men undertook a little over 10 percent (Romulo A. Virola and Sylvia M. de Perio 1998). Julie H. Gallaway and Alexandra Bernasek (2002) found that in Indonesia, having young children significantly increased the probability of a woman staying at home, while it had no effect on men. It is evident then that unless social policies recognize, reduce, and redistribute this unpaid work (Rosalind Eyben and Marzia Fontana 2011), women's labor force participation rates and their economic status will continue to lag behind men's rates.

CONTEXTUALIZING THE RESULTS

It is our contention that exports became identified with the feminization of labor in the early industrialization phase of a number of developing countries because the technological content of manufacturing production at the time was labor intensive. In other words, previous studies could be said to suffer from an omitted variable bias that placed undue emphasis on manufacturing exports as the driver for the rising female share of employment. Exporting certainly compounds competitive pressures and stimulates the search for low-cost labor, and this is particularly so in labor-intensive production where labor costs as well as the role of gender stereotypes have been critical. However, as labor costs make up a smaller share of total cost in capital-intensive production, the same competitive pressures are less likely to apply. It is conceivable that a rise in exports is consistent with a declining share of female employment when the nature of production changes, as we find in our sample. Gary Gereffi and Donald L. Wyman term this transition as the shift from primary to "secondary" export-oriented industrialization (EOI), which involves the production of "higher value-added items that are skill-intensive and require a more fully developed industrial base" (1990: 17).

The second tier-NICs of Southeast Asia – Malaysia, Indonesia, and Thailand – industrialized using EOI strategies in the 1970s and 1980s. Southeast Asia attracted a wave of inward foreign direct investment in labor-intensive manufacturing in the late 1980s that was relocating from the first-tier East Asian NICs, due to currency appreciation, high labor costs, and withdrawal of the Generalized System of Preferences (GSP) under the GATT (Jomo 2009). These countries were subsequently successful in upgrading their manufacturing sectors into higher value-added activities using exports as a driver and made impressive gains in manufacturing productivity from 1985 to 2007: Malaysia recorded an average annual growth rate of 5 percent, and Indonesia and Thailand close to 4 percent. In Malaysia and Indonesia, this was associated with a declining female share of employment. Malaysia's electronics industry and machinery and metal products were major drivers of exports and manufacturing expansion, while in Indonesia it was auto parts, garments, and electronic components. Thailand implemented primary export-oriented industrialization only in the 1980s, and continues to feminize: in 1989, female-intensive industries – including nonmetallic mining, precious stones, food manufacturing, tobacco, wood, leather, leather products, and rubber – comprised 47.7 percent of GDP (Mathana Phananiramai 1996). The Philippines has been a laggard in the region: in the period under consideration, it experienced sluggish manufacturing productivity growth and slight defeminization. It behaves more like a Latin American country in this respect, a parallel noted by other observers too.

As compared to Southeast Asia, in most of Latin America, import substitution industrialization remained the dominant policy approach through the 1970s.[20] The 1980s were characterized as the "lost decade" on the continent, with rampant debt crises, double-digit inflation, financial distress, and output losses (Gabriel Palma 2003). Most Latin American countries recovered in the 1990s; but while GDP growth turned positive between 2003 and 2008, the growth of manufacturing remained sluggish in most countries. Manufacturing value added in Latin America (large countries) grew at around 2.6 percent per year as compared to 6 percent in Southeast Asia over the period 1991–2006.[21] Manufacturing productivity in these countries was only 0.26 percent (annual average) as compared to 3.5 percent in Southeast Asia during that time.

Mexico diversified and expanded its manufacturing industry through exports, especially in garments, automotives, and electronic equipment during the 1990s, though its linkage to the rest of the economy and contribution to value added remained low (Mikio Kuwayama 2009). Brazil's productivity in a number of traditional manufacturing industries such as footwear, apparel, and furniture remains extremely low. Peru and Colombia, both of which had strongly negative growth in manufacturing productivity, remain mostly primary product exporters, and have limited manufacturing capabilities. Chile's success with industrialization is well documented, and it is noteworthy that it never experienced a feminization in its manufacturing. Both Costa Rica and the Dominican Republic undertook export-oriented industrialization in the early 1980s, rapidly increasing their share of apparel exports to the US until the mid 1990s, after which a slowdown in demand and severe competition from China led to major losses in market share (Diego Sanchez-Ancochea 2006). Costa Rica has been much more successful at diversifying and upgrading into medium- and high-tech exports than the Dominican Republic, and defeminization from the late 1990s onward appears to be contiguous with this process (Sanchez-Ancochea 2006).

In general, the feminization in Latin America appears to be qualitatively different from that experienced in Southeast Asia in the 1970s and 1980s, which took place in the context of an expanding industrial sector, rising productivity, and rapid employment growth overall. On the other hand, in all of the large Latin American countries in our sample except Venezuela, deindustrialized, as the share of manufacturing value added in GDP, fell from 19 percent to 16 percent between 1984 and 2007.[22] In Southeast Asia it expanded from 21 percent to 29 percent in the aggregate.[23] Latin America during this period also experienced a generalized distress in the labor market with deep losses in traditional manufacturing jobs in mining, utilities, and construction, especially in Brazil, Colombia, and Venezuela (Laís Abramo and Maria Elena Valenzuela 2005). Informality was also on the rise, with six out of ten new jobs created between 1990

and 2003 situated in the informal sector (Abramo and Valenzuela 2005). Since we measure total employment, our estimates also include informal employment, though the data do not allow for separate estimations for the same. The fact that feminization in Latin America is occurring in the context of a shrinking manufacturing sector has critical implications for women's earnings and prospects for growth and advancement on the job, which need to be examined more closely at the country level.

AN ECLECTIC MODEL OF FEMINIZATION

Below we schematize the various theoretical relationships with respect to the female share of employment that we have discussed so far. This model is an eclectic and suggestive one, and we present it as a tool that can be used for further research and analysis. We have analyzed four basic relationships among growth in female share of employment in manufacturing (λ), capital intensity (κ),[24] the female–male wage ratio (ω), and the growth of exports (χ). We can write these in three equations as follows:

$$(1) \quad \omega = f(\lambda, \chi),$$
$$(2) \quad \chi = g(\omega, \kappa, \mathrm{Y}),$$
$$(3) \quad \lambda = h(\kappa, \omega, \mathrm{Y})$$

where Y is world income, and other variables are as defined above. In equation (1) the gender wage gap is a function of the female share of employment. A higher demand for women's labor is expected to reduce the gender wage. Depending on the theoretical framework employed, exports can be positively or negatively related to the gender wage gap: competitive pressures due to exports can exert downward pressure on wages (Stephanie Barrientos, Naila Kabeer, and Naomi Hussain 2004; Günseli Berik, Yana van der Meulen Rodgers, and Joseph E. Zveglich 2004), but greater trade openness might also increase the demand for female women's labor and raise their wages. Equation (2) shows exports as a result of world income and relative prices, where prices are due in part to the gender wage gap and the level of productivity. A wider gender wage gap will presumably be associated with lower costs and thus greater export competitiveness (Seguino 2000; Matthias Busse and Christian Spielmann 2006). Capital intensity and world income are also expected to be positively related to exports. Equation (3) shows female share of employment as a function of the other variables, but the system is determined simultaneously.

Figure 7 brings together these various relationships combining hypotheses about the relationship between shifts in female share and changes in capital intensity, the gender wage gap, and exports. A central finding from the evidence presented above is that higher capital intensity is associated with lower female share of employment, as illustrated in

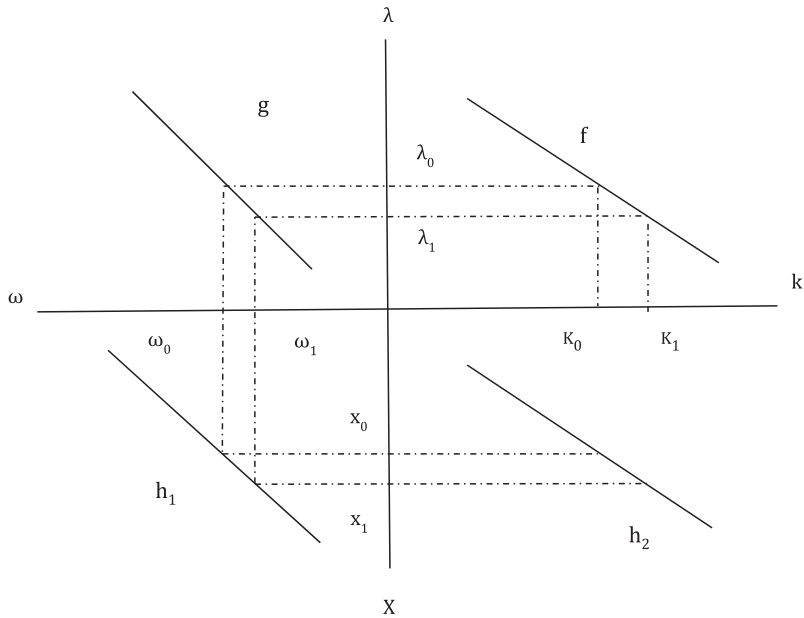

Figure 7 An eclectic model of feminization

the northeast quadrant. In the northwest quadrant, a fall in the female share of employment is associated with a rising gender wage gap as the demand for women's labor falls. A downsloping curve in that quadrant is not implausible, since it captures the relation we find in some countries such as in Brazil and Thailand in our sample, for instance. Nonetheless, we leave the upsloping curve in Figure 7 as the literature has emphasized this relationship. The southwest quadrant depicts the relation between the gender wage gap and the growth of exports, whereby a widening of the gender wage gap can have the effect of stimulating exports if women are employed as low-cost labor. Finally, the southeast quadrant plots the relationship between labor productivity and exports, namely that greater capital intensity is associated with more rapid growth in exports. A simple exercise with the diagram is to trace the effect of a rise in capital intensity. The rise from κ_0 to κ_1 is consistent with a bidding down of women's wages relative to men, a rise in export growth, and a fall in the growth of the female share of employment.

QUALIFICATIONS AND FUTURE WORK

Although exports have shown an impressive rise in both Southeast Asia and Latin America over the period 1985–2007, this trend has been associated

with both a rising and declining feminization of labor in these regions. This undermines the previous emphasis of the feminization literature on the positive link between trade openness and export growth and the female share of employment in manufacturing. We find that the technological conditions of production rather than exports *per se* are critical in determining whether women will become a preferred source of labor in manufacturing production. Thus it can be expected that as production becomes more capital intensive, as has been the case in East Asia in general, women will tend to lose their share of employment in manufacturing in the aggregate. This finding has important policy implications that need to be considered when developing countries attempt to upgrade their products and processes in manufacturing. Although we do not attempt here to unpack the causes for the negative relation between the female share of employment and manufacturing labor productivity, an abundance of case studies has suggested possible causes. Among them are: reduced (labor) cost pressures in capital-intensive production, gender biases and norms that govern what work men and women are better suited for, and lack of on the job training for women. The feminization occurring in Latin America appears to be qualitatively different in nature than the previous experience of Southeast Asia, as it takes place in the context of deindustrialization at the macroeconomic level.

We do not conduct a detailed sectoral analysis of manufacturing in this paper, as we are concerned here with broad macroeconomic trends, though such a study is certainly indicated as an area of future research. Further, it is important to note that although gender ideologies have been instrumental in the expansion of women's employment in labor-intensive manufacturing, those norms are also being continually reconstructed through the process of production (Salzinger 2003). Emerging ideological forms warrant further investigation and discussion.

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NOTES

1 Feminization of labor is defined as the female share of total employment.

2 We should note that high-income countries in our sample exhibit a similarly low correlation between the growth in manufacturing exports and the female share of manufacturing employment.

3 See Appendix A for data availability.

4 The first-tier NICs of East Asia – Japan, South Korea, Singapore, and Hong Kong – experienced an even more dramatic defeminization, falling approximately 10 percentage points over the period, though they are not considered here.

5 Feminist economists have critiqued this assumption, arguing that the definition of what is high skill and low skill is itself a process that is rife with gender bias.

6 There is a vast amount of research testing this hypothesis. For a study of Korea and Taiwan and a nice summary of the literature, see Günseli Berik, Yana van der Meulen Rodgers, and Joseph E. Zveglich (2004). At the same time there are a number of problems applying the orthodox model to the question of changes in the female share of employment. For a discussion, see Sheba Tejani and William Milberg (2010).

7 See Nilüfer Çağatay and Günseli Berik (1990) and Şule Özler (2000) for the case of Turkey; Adrian Wood (1991) for the US; Josh Ederington, Jenny Minier, and Kenneth R. Troske (2009) for Colombia; Naeem Ahmed and Kalim Hyder (2007) for Pakistan;

and Nilüfer Çağatay and Şule Özler (1995) and Standing (1989, 1999) for a cross-country perspective.

[8] Many studies examine the effects of tariff liberalization and import expansion on gender equality, including assessing the Becker hypothesis that trade liberalization dampens gender discrimination and reduces the gender wage gap. On the US, see Sandra E. Black and Elizabeth Brainerd (2004) and Ebru Kongar (2007). On developing countries, see Berik, Rodgers, and Zveglich (2004) and Remco H. Oostendorp (2004). On China, see Elissa Braunstein and Mark Brenner (2007), and on Pakistan, see Rizwana Siddiqui (2009).

[9] These results are not included for reasons of space.

[10] For instance, Seguino (1997, 2000), Matthias Busse and Christian Spielmann (2006), and Benjamin H. Mitra-Kahn and Trishima Mitra-Kahn (2008).

[11] Two exceptions are Özler (2000) and David Kucera (2001).

[12] For instance, the differences between the prices of consumer goods and services in different countries and exchange rates need to be factored in. See http://laborsta.ilo.org/applv8/data/c5e.html for more details.

[13] See Wood (1991); Çağatay and Özler (1995); Naila Kabeer and Simeen Mahmud (2004); and Sheba Tejani (2011).

[14] See Ruth Milkman (1976, 1987), Jill Rubery (1978), Sara Horrell and Jane Humphries (1995), United Nations (1999), ILO (2004), Teri L. Caraway (2007), and Stephanie Seguino, Günseli Berik, and Yana van der Meulen Rodgers (2010) for discussions on the reasons for persistent sex segmentation in the labor market.

[15] Data from World Bank (2010) on secondary and tertiary gross enrollment ratios are not presented here for reasons of space.

[16] For employment data, we use the ILO's LABORSTA database on "Total Employment" that provides data for nine sectors, including manufacturing at the 1-digit level (ILO 2009). Total employment includes paid employment and selfemployment (see http://laborsta.ilo.org/applv8/data/c2e.html for an expanded definition.) For the variables manufacturing value added, GPD per capita, and women's and men's labor force participation rates, we rely on World Bank (2009). For ratio of average schooling years, we use Barro and Lee (2010). We obtained manufacturing exports from World Trade Organization Statistics Online (WTO 2009).

[17] For instance, Robert J. Barro (2013) uses lagged values of independent variables as instruments to assess the impact of human capital on growth for a large cross-country panel.

[18] See Fumio Hayashi (2000) for details.

[19] We also conduct a sensitivity test on manufacturing export share by running the multivariate regression without manufacturing labor productivity. The coefficient changes sign (-0.02) but remains statistically insignificant (p-value 0.134), suggesting that manufacturing export growth became delinked from labor-intensive production, as the nature of export production changed over time.

[20] Mexico and Brazil experimented with export-oriented industrialization relatively early as compared to the rest of Latin America (Caraway 2007).

[21] Large countries in Latin America are those with average total employment greater than 5 million and include Argentina, Brazil, Chile, Colombia, Mexico, and Peru. The results are equivalent to using the criterion of average manufacturing employment greater than 500,000.

[22] The small countries slightly expanded their share from 16 percent to 18 percent.

[23] From 1984 to 2007, Thailand expanded its share of manufacturing value added in GDP from 23 percent to 36 percent, Malaysia from 19 percent to 28 percent, and Indonesia from 16 percent to 27 percent; only the Philippines experienced a relative decline.

[24] Though we have operationalized our empirical model using labor productivity, we use capital intensity as a variable in our eclectic model, as the former is expected to be endogenous to the latter.

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APPENDICES

Appendix A Sample countries by level of development

	High-income countries		*Middle-income countries*
1	Australia	1	Argentina
2	Austria	2	Azerbaijan
3	Bahamas	3	Brazil
4	Canada	4	Chile
5	Czech Republic	5	China
6	Denmark	6	Colombia
7	Finland	7	Costa Rica
8	Germany	8	Croatia
9	Greece	9	Dominican Republic
10	Hong Kong	10	Ecuador
11	Hungary	11	Egypt
12	Iceland	12	El Salvador
13	Ireland	13	Estonia
14	Italy	14	Georgia
15	Japan	15	India
16	Korea, Republic of	16	Indonesia
17	Netherlands	17	Latvia
18	New Zealand	18	Lithuania
19	Norway	19	Malaysia
20	Portugal	20	Mexico
21	Puerto Rico	21	Moldova
22	Singapore	22	Morocco
23	Slovakia	23	Panama
24	Slovenia	24	Peru
25	Spain	25	Philippines
26	Sweden	26	Poland
27	Switzerland	27	Russia
28	Trinidad and Tobago	28	South Africa
29	United Kingdom	29	Thailand
30	United States	30	Turkey
		31	Venezuela
		32	Pakistan[a]

Note: [a]Low-income country.

Appendix B Sample countries by region and years of female employment data

	Country	*Start year*	*End year*
	East Asia and Pacific		
1	China[a]	1987	1999
2	Hong Kong	1984	2007
3	Indonesia	1985	2007
4	Japan	1984	2007
5	Korea, Rep.	1984	2007
6	Malaysia	1984	2007
7	Philippines	1984	2007
8	Singapore	1984	2007
9	Thailand	1984	2007
	Europe and Central Asia		
1	Azerbaijan	1999	2007
2	Croatia	1996	2007
3	Czech Republic	1993	2007
4	Estonia	1989	2007
5	Georgia	1998	2007
6	Hungary	1994	2007
7	Latvia	1996	2007
8	Lithuania	1998	2007
9	Moldova	2000	2007
10	Poland	1994	2007
11	Russia	1997	2007
12	Slovakia	1994	2007
13	Slovenia	1993	2007
14	Turkey	1984	2007
	Latin America and Caribbean		
1	Argentina	1991	2006
2	Bahamas	1986	2007
3	Brazil	1984	2006
4	Chile	1984	2007
5	Colombia	1985	2007
6	Costa Rica	1984	2007
7	Dominican Rep.	1996	2007
8	Ecuador	1990	2006
9	El Salvador	1985	2006
10	Mexico	1991	2007
11	Panama	1984	2007
12	Peru	1991	2001
13	Puerto Rico	1984	2007
14	Trinidad & Tob.	1984	2005
15	Venezuela	1984	2007

	Country	*Start year*	*End year*
	Middle East and North Africa		
1	Egypt	1984	2006
2	Morocco	1990	2006
	Other industrialized countries		
1	Australia	1984	2007
2	Canada	1984	2007
3	New Zealand	1986	2007
4	US	1984	2007
	Western Europe		
1	Austria	1984	2007
2	Denmark	1984	2007
3	Finland	1984	2007
4	Germany	1991	2007
5	Greece	1984	2007
6	Iceland	1991	2007
7	Ireland	1984	2007
8	Italy	1984	2007
9	Netherlands	1985	2007
10	Norway	1984	2007
11	Portugal	1984	2007
12	Spain	1984	2007
13	Sweden	1984	2007
14	Switzerland	1984	2007
15	UK	1984	2005
	South Asia		
1	India[a]	1984	2005
2	Pakistan	1985	2007

Note: [a]Paid employment in manufacturing (versus total employment in manufacturing).