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Global Defeminization?
Industrial Upgrading, Occupational Segmentation and Manufacturing
Employment in Middle-Income Countries

Sheba Tejani and William Milberg*

Schwartz Center for Economic Policy Analysis & Department of Economics
New School for Social Research, 6 East 16th Street, New York, NY 10003

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*Research Assistant and Faculty Research Fellow, Schwartz Center for Economic Policy Analysis, respectively. The authors are grateful to Gunseli Berik, Diane Elson, Teresa Ghilarducci, Jeff Johnson, Benjamin Mitra-Kahn, Stephanie Seguino, and Lance Taylor for discussion of this project in earlier stages and to the ILO for providing sectoral data used in Section 7. We alone are responsible for remaining errors.

Abstract

This paper investigates whether the stylized fact relating globalization with the “feminization” of labor still holds, or if the defeminization of manufacturing employment in developing countries has set in. We describe trends in the female intensity of employment in manufacturing over the period 1985 to 2007 for a sample of 60 high and middle-income countries. We focus on two regions that display contrasting trends and find that the defeminization of labor observed in Southeast Asia as well as the ongoing feminization in Latin America are driven by shifts in capital intensity and manufacturing productivity. One possible reason for this correlation is the anti-female bias in labor demand changes that result from output shifts in developing countries that are successful in upgrading their industry out of low-skill intensive manufactures and into higher-tech production. Further, we conduct a decomposition exercise to determine the impact of structural change, or the shift of output from industry to services, on aggregate female intensity in the two regions. We find that the gender wage gap and educational attainment cannot account for the shifts we see in female intensity, which suggests that gender stereotypes about work and occupational segmentation still are important in structuring female employment.

Global Defeminization? Industrial Upgrading, Occupational Segmentation and Manufacturing Employment in Middle-Income Countries

1. Introduction

It has become a commonplace to associate "globalization"--an increase in trade openness, for example--with "feminization"--a rise in the female intensity of formal employment--especially in developing countries. Standing (1989, 1999) attributes "global feminization" to the fact that women provide a cheaper and more flexible source of labor than men and thus are preferred by employers seeking to expand exports by lowering labor costs, raise flexibility of hiring and firing in response to fluctuations in lowering product demand, and to minimize the bargaining power of workers on issues of overtime, workplace safety and collective bargaining. Seguino (1997, 2000) analyzes the buffer female labor force as an essential ingredient of the East Asian export and growth miracle. Joekes (1999) identifies the expansion of export processing zones as the locus of rapid female employment growth in the promotion of developing country exports of manufacturers. Many other authors have linked globalization with a feminization of employment.¹

In contrast to these now-classic findings, a number of recent studies have observed a *defeminization* of manufacturing employment in developing countries, even as globalization continues.² To the extent that defeminization -- that is, a decline in the female share of employment -- is broadly observed, it raises a number of important questions. First, does the stylized fact relating globalization and feminization no longer hold? And second, if globalization now has a defeminizing effect, then what are the

¹ See, for example, Wood (1991), Joekes & Weston (1994), Cagatay & Ozler (1995) and Ozler (2000).

² Joekes (1999), United Nations (1999), Ghosh (2001), Cling & Letilly (2001), Jomo (2009).

reasons? In this paper we assess these issues by looking at trends in female intensity of employment -- defined here as the female share of total employment in manufacturing -- across high and medium-income countries between 1985 and 2006.³ We find that over the period 1985-2006, feminization of manufacturing production has, on average, continued in the middle-income countries, while defeminization characterizes the high-income countries.⁴ However, this generalization veils important inter-regional and international differences within the middle-income group. While the Latin American and Caribbean middle-income countries in our sample continued up to 2005 to experience rising female intensity of manufacturing employment, most East Asian and Pacific countries in our sample have experienced a defeminization beginning in the mid-1980s.

The focus in this paper is on the middle-income countries of Latin America and Southeast Asia. Data are not available for many low-income developing countries. And the high-income countries have been the focus of study for decades.⁵ Both Southeast Asia and Latin America experienced strong growth in merchandise exports over the period, so we rule out export growth *per se* as a determinant of the different trends in the female intensity of employment. Instead, we find that feminization, and subsequently defeminization, has more to do with the type of manufacturing growth that has occurred during an ongoing period of globalization. Moreover, this process is mediated by the degree of occupational segmentation by gender.

³ Total employment here includes paid employment and self employment. See <http://laborsta.ilo.org/applv8/data/c2e.html> for details.

⁴ We use the standard World Bank classification in where high income countries are classified as those with GNI per capita of \$11,906 or more, while middle income countries have an income range of \$976 to \$11,905 that is divided into upper-middle and lower-middle categories. (See <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0..contentMDK:20420458~menuPK:64133156~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html> for details.)

⁵ On the US, see Black and Brainerd (2004) and Kongar (2007). On Japan and Germany, see Kucera (2001).

This paper has seven sections. In section two we describe the regional and national trends in female intensity of manufacturing employment. In section three we look at the theoretical and empirical connection between exports and the female intensity of employment, including a consideration of the role of changes in the gender wage gap. Section four addresses the role of industrial upgrading, and Section five looks at skills attainment and occupational discrimination. Section 6 briefly looks beyond manufacturing to assess the role of structural change and deindustrialization. Section seven concludes.

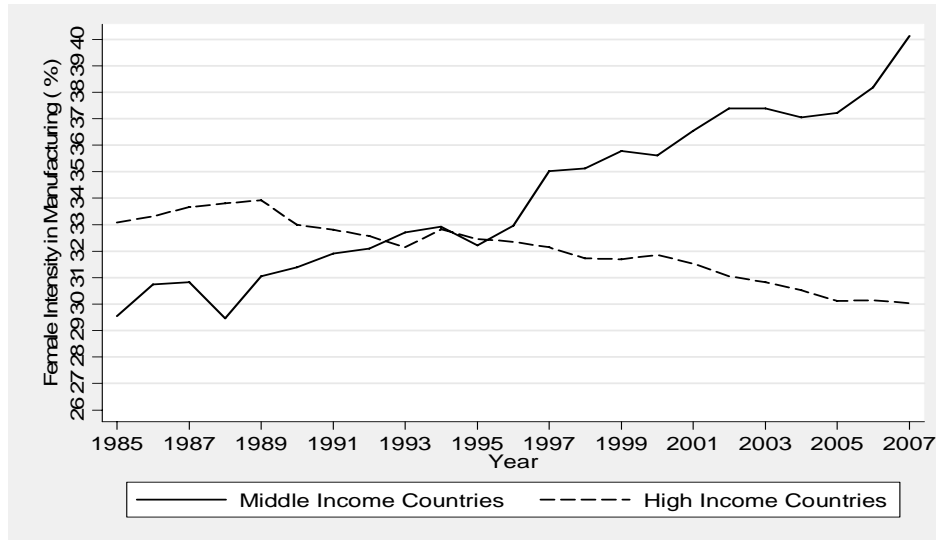
2. Globalization and Feminization Revisited: Trade and Wages

In this section we summarize the national and regional trends in the female intensity of manufacturing employment. Then we consider the role of international trade and the gender wage gap in driving these trends. The female intensity of manufacturing employment in middle-income countries rose steadily over the period 1985-2005, while high-income countries, which started out with a higher level of female intensity experienced a decline (Figure 1).⁶ Female intensity data by income group hide important within-group distinctions, especially along regional lines. We see in Table 1 that while Latin American and Caribbean, Europe and Central Asian as well as a couple of South Asian countries have continued into the 21st century to experience a rising female intensity of employment in manufacturing, East Asian and Pacific middle-income countries have experienced defeminization, that is a decline in the female intensity of manufacturing employment, as have Western Europe and Other Industrialized Countries.

We should note that Southeast Asia is defeminizing from a relatively high level of

⁶ For a list of countries included in each category, see Appendix A.

Figure 1: Average Female Intensity of Employment in Manufacturing for High- and Middle-Income Countries (female employment as % of total employment)



Note: See Appendix A for the countries in each group.
Source: Authors' illustration based on ILO (2009a).

| Region | 1985-1995 | | 1996-2007 | | 1985-2007 | |
|--------------------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
| | Average | Growth ^a | Average | Growth ^a | Average | Growth ^a |
| East Asia & Pacific | 43.17 | 0.32 | 39.52 | -0.79 | 41.84 | -0.12 |
| Latin America & Caribbean | 29.54 | 0.88 | 37.93 | 1.79 | 32.08 | 1.65 |
| Other Industrialized Countries | 31.76 | -0.20 | 29.73 | -0.52 | 31.21 | -0.31 |
| Europe & Central Asia | . | . | 37.54 | 1.24 | 30.98 | 1.24 |
| Western Europe | 28.54 | 0.12 | 27.78 | -0.24 | 28.45 | -0.09 |
| Middle East & North Africa | 21.03 | 4.46 | 16.74 | -2.04 | 19.76 | 0.28 |
| South Asia | 10.65 | 2.60 | 17.43 | 3.74 | 13.06 | 3.04 |

Note: Data availability varies by country; see Appendix B.
a: Average of Annuals.
Source: Authors' computation based on ILO (2009a).

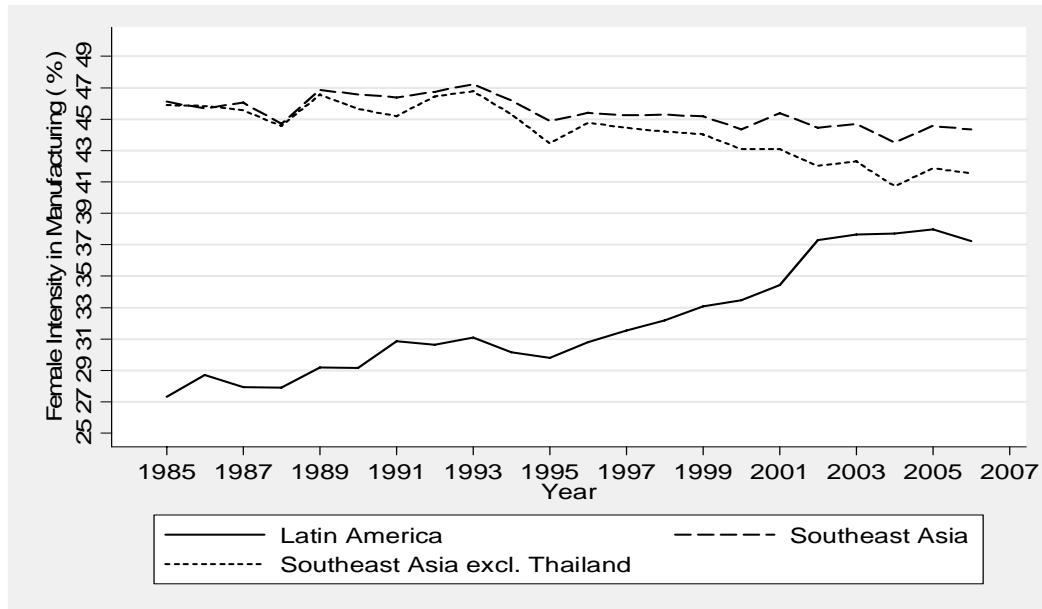
female intensity compared to Western Europe and other industrialized countries. For South Asia, data are available only for India and Pakistan, but they are experiencing a feminization of employment, beginning from a historically low base of female employment in manufacturing.

The contrast between Southeast Asian and Latin American countries in terms of the female intensity of employment is quite stark, as seen in Figure 2. Southeast Asia underwent a feminization of its manufacturing in the 1970s and 1980s, and a gradual defeminization has occurred since the early 1990s. This pattern holds across our sample, including Indonesia, Malaysia and Philippines (Figure 3). The exception to the Southeast Asian pattern is Thailand, which continues to feminize through the latest observation.⁷ The first-tier newly industrializing countries of East Asia—Japan, South Korea, Singapore and Hong Kong—display an even more dramatic defeminization, falling approximately 10 percentage points over the period 1985-2007, though we do not focus on them in this paper.

In comparison, feminization continued across the larger Latin American countries in our sample, including Brazil, Mexico, Argentina, Venezuela and Columbia as well as in El Salvador (Figures 4a, 4b). The trend in Chile, Peru and Costa Rica is flat or slightly downward (Figure 4b). The levels of female intensity in most of Latin American and the Caribbean are lower than those in Southeast Asia, with important exceptions: Colombia, Mexico and El Salvador had levels of female intensity similar to the Southeast Asian sample in 1985, whereas Brazil, Argentina, Venezuela and Chile had very low levels of female intensity of around 25%.

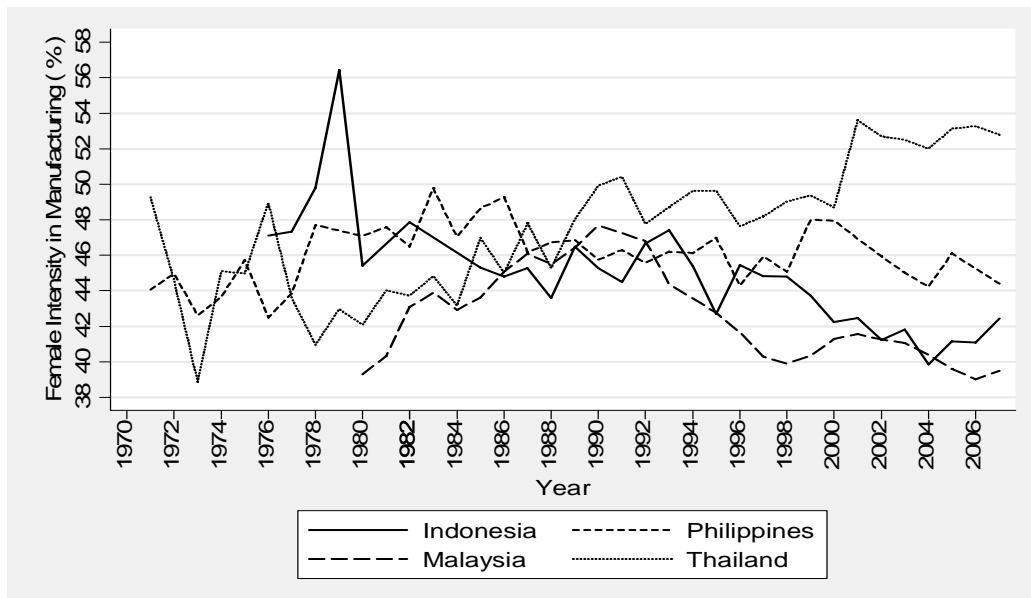
⁷ See Section 4.1 below for more discussion of the Thai case.

Figure 2: Female Intensity of Manufacturing Employment, Southeast Asian and Latin American Middle-Income Countries, 1985-2006



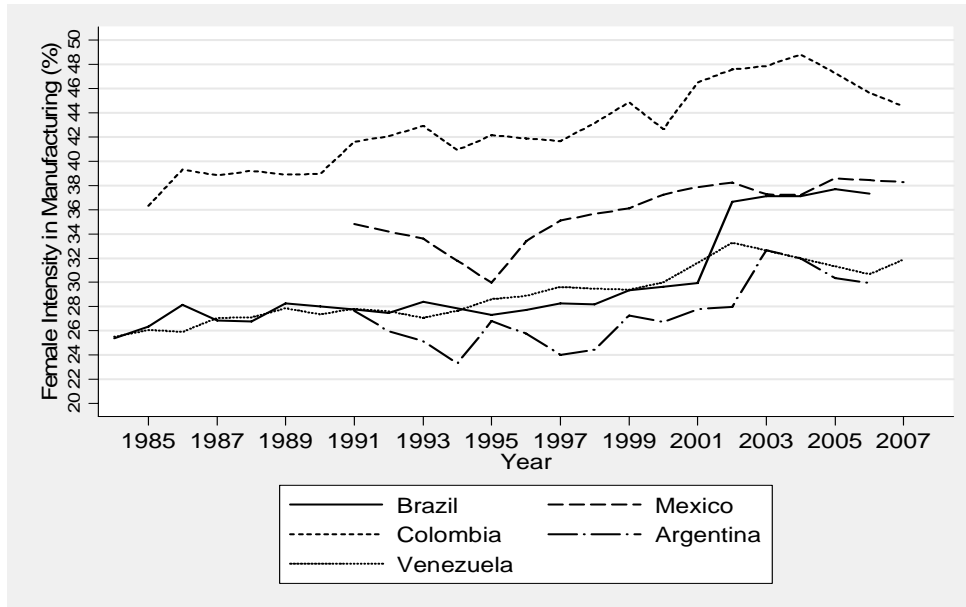
Note: Data availability varies by country; see Appendix B.
Source: Authors' illustration based on ILO (2009a).

Figure 3: Female Intensity of Manufacturing Employment in Southeast Asian & Pacific Middle-Income Countries, 1970-2007



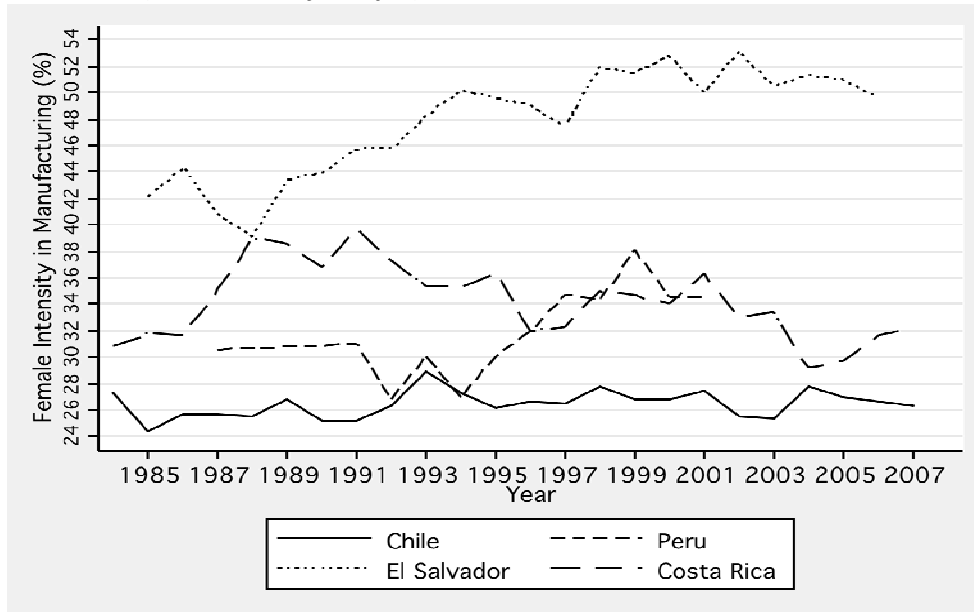
Source: Authors' illustration based on ILO (2009a).

Figure 4a: Female Intensity of Manufacturing Employment in Latin America & Caribbean, 1985-2007 (Large country sample)



Source: Authors' illustration based on ILO (2009a).

Figure 4b: Female Intensity of Manufacturing Employment in Latin America & Caribbean, 1985-2007 (Small country sample)



Note: Peru and Chile are part of our large country sample.

Source: Authors' illustration based on ILO (2009a).

Table 2 shows the average level and growth rate of female intensity for all countries in our two regional samples for each decade covered in the sample. In general, defeminization in Southeast Asia accelerated in the period 1996 to 2007 even though Thailand is feminizing. Malaysia is defeminizing the most rapidly. The trend in the Latin American large-country sample is exactly the reverse of that in Southeast Asia: feminization accelerated from the mid-90s onwards in all cases except Colombia. Brazil is feminizing the fastest. In the Latin America small country sample, feminization was a strong trend from 1985 to 1995 while defeminization set in during the following decade.

| Table 2: Female Intensity in Manufacturing, 1985 to 2007 | | | | | | |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Southeast Asia and Latin America, Middle Income Countries | | | | | | |
| | 1985 to 1995 | | 1996 to 2007 | | 1985 to 2007 | |
| | Average | Growth ^c | Average | Growth ^c | Average | Growth ^c |
| East Asia | | | | | | |
| Indonesia | 45.21 | -0.52 | 42.59 | 0 | 43.84 | -0.24 |
| Malaysia | 45.37 | 0 | 40.49 | -0.65 | 42.83 | -0.34 |
| Philippines | 46.78 | 0.02 | 45.76 | -0.41 | 46.28 | -0.21 |
| Thailand | 48.11 | 1.38 | 51.08 | 0.57 | 49.39 | 0.96 |
| Latin America^a | | | | | | |
| Argentina | 25.77 | -0.41 | 28.08 | 1.24 | 27.36 | 0.8 |
| Brazil | 27.56 | 0.72 | 32.64 | 3.05 | 29.9 | 1.89 |
| Chile | 26.09 | -0.23 | 26.71 | 0.16 | 26.45 | -0.02 |
| Colombia | 40.11 | 1.56 | 45.21 | 0.53 | 42.77 | 1 |
| Mexico | 32.88 | -3.67 | 36.95 | 2.12 | 35.76 | 0.67 |
| Peru | 29.23 | 0.03 | . | . | 31.96 | 1.57 |
| Venezuela | 27.29 | 1.08 | 30.54 | 2.43 | 28.59 | 1.64 |
| Latin America^b | | | | | | |
| Costa Rica | 36.08 | 1.7 | 32.78 | -0.77 | 34.21 | 0.41 |
| Dominican Rep. | . | . | 32.87 | -0.02 | 32.87 | -0.02 |
| El Salvador | 44.85 | 1.76 | 50.75 | 0.12 | 47.8 | 0.9 |
| Ecuador | 35.09 | 2.98 | 34.85 | -0.41 | 34.94 | 0.65 |
| Panama | 29.64 | 0.41 | 31.23 | 1.55 | 30.4 | 1.01 |
| Note: Data availability varies by country. Please see Appendix B. | | | | | | |
| a: Large country sample; b: Small country sample; c: Average of annuals | | | | | | |
| Source: Authors' calculation based on ILO (2009a). | | | | | | |

The role of international trade

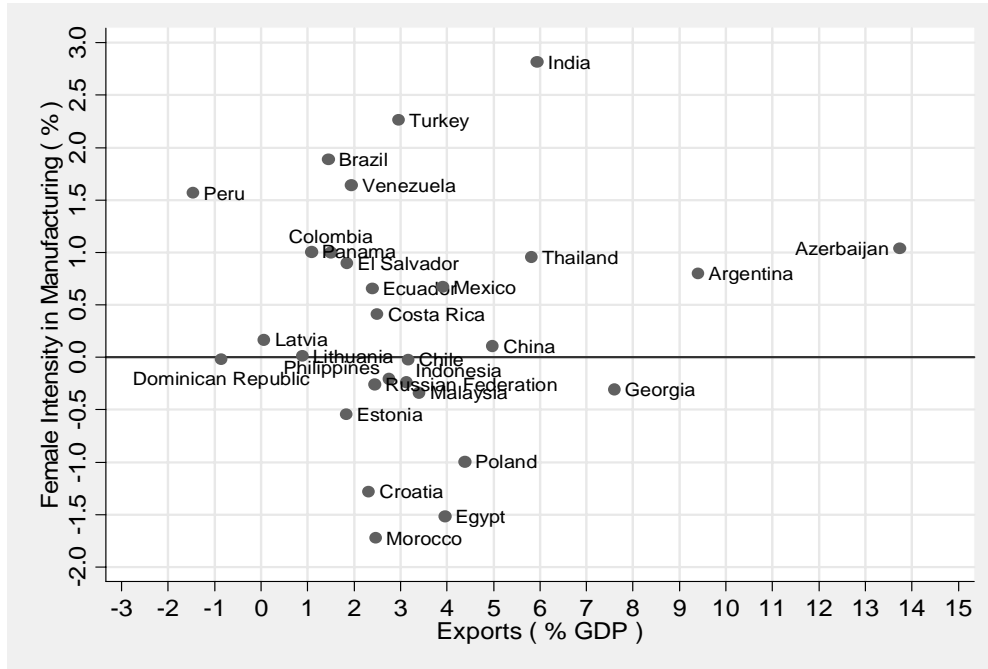
Recent evidence shows that the positive relation between the growth in world trade and the feminization of manufacturing employment found in earlier studies continues to hold on average for middle-income countries. Middle-income developing countries expanded their share of world exports of manufactures from 13% in 1981 to 27% in 2005, the same period in which the female share of employment in middle-income developing countries was rising. Standing's (1989, 1999) argument is that the rising female intensity of manufacturing employment was driven by the shift by developing countries into manufactures exports, where these are largely low-skill labor intensive and often produced in export processing zones. Labor deregulation and the implementation of structural adjustment programs, including trade liberalization, led, according to Standing, to a "global feminization of labor" in industrialized and developing countries (in manufacturing, and in non-agricultural work as a whole) in the 1980s. Structural adjustment in particular, he argued, created conditions in which firms increasingly hired women workers in order to cut labor costs and to "flexibilize" the labor force. Women were particularly suited to the task because they had lower aspirations and a lower efficiency wage, and were more easily employed as casual, contract or part-time labor with little or no benefits (Standing, 1989, p. 1079). Standing (1999) confirmed his earlier results, this time for the period 1975-95. A number of other studies of developing countries have found a positive correlation between exports as a percent of GDP and the female intensity of manufacturing employment.⁸

Using the latest ILO data, we find that there is no clear relationship between the average rate of growth of exports and the rate of feminization (Figures 5a and 5b).

⁸ See Wood (1991), Cagatay and Ozler (1995), Ozler (2000) and Seguino (1997, 2000)

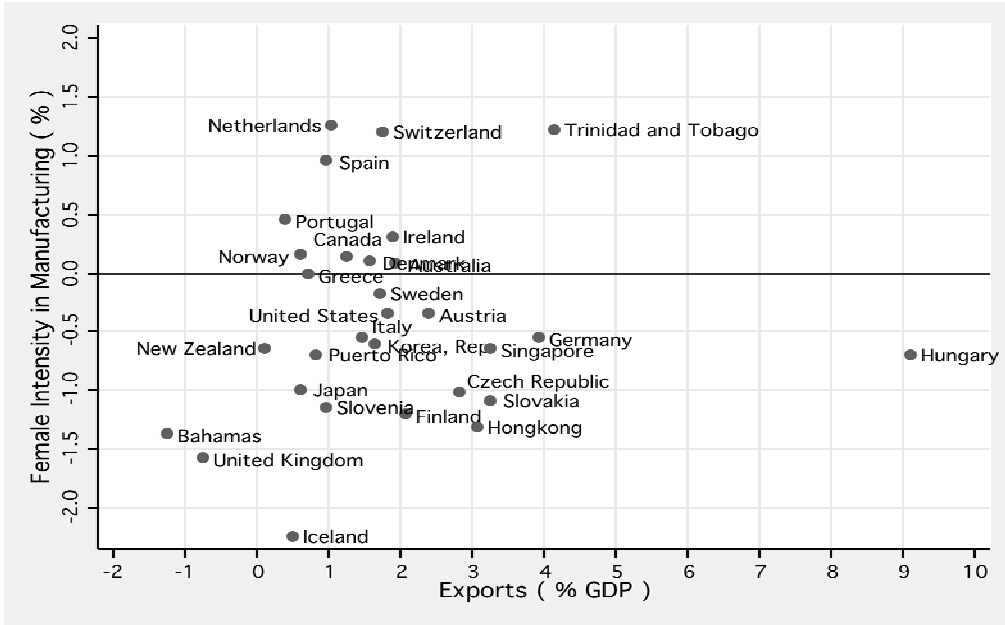
Focusing on the middle-income countries in Figure 5a, we see that most countries experienced export growth rates of 2-5% per annum. But this narrow range was associated with a very broad range of change in female intensity, including some countries rapidly feminizing (e.g. Turkey, Brazil and Venezuela) and some clearly defeminizing (e.g. Egypt, Poland, Malaysia). Changes in export orientation alone seem to be inadequate as an explanation of trends in female intensity. We must look, as Jomo (2009) argues, behind the export growth performance and at underlying changes in industrial structure and labor market institutions.

Figure 5a: Female Intensity of Manufacturing Employment and Exports, Middle-Income Countries, 1985-2006 (average of annual growth)



Note: Data Availability varies by country. Please see Appendix B.
Source: Authors' illustration based on ILO (2009a) and WDI (2009).

Figure 5b: Female Intensity of Manufacturing Employment and Exports, High-Income Countries, 1985-2006 (average of annual growth)



Note: a. Data availability varies by country. Please see Appendix B.
Source: Authors' illustration based on ILO (2009) and WDI (2009).

The gender wage gap as cause and effect

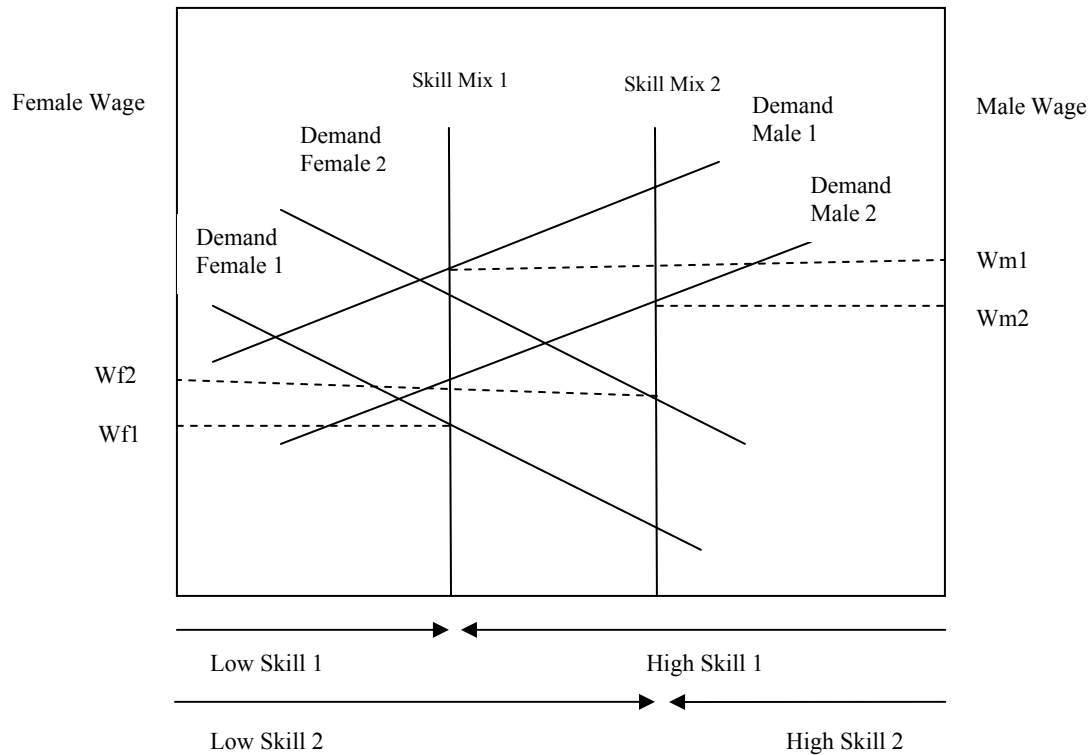
The Heckscher-Ohlin trade theory is consistent with Standing's analysis of global feminization. The model implies that trade liberalization between developed (relatively high-skill abundant) and developing (relatively low-skill abundant) countries should benefit the relatively abundant factor in each country. The theory is based on the assumption of full employment, so, depending on the elasticity of labor supply, most adjustment occurs in terms of relative factor returns. Women's fate is associated with that of low-skill workers: Women are assumed to have attained on average a lower level of skills and thus to be concentrated in low-skill jobs. Trade liberalization raises the wages of skilled (and "male") workers in the developed countries, while wages of unskilled (and "female") workers should rise relatively in developing countries, as developing countries specialize in low-tech and low-skill goods.⁹

The gender-bias effects of trade liberalization are depicted in Figure 6, which shows a shift in the skill- (and thus gender-) intensity of labor demand following trade liberalization. Male and female employment is measured on the horizontal axis while wages for the two groups are measured on the left and right vertical axes respectively. Trade liberalization will raise global demand for low-skill intensive goods produced in developing countries, changing the skill- and male-intensity of production to "Skill Mix 2" in the Figure, and consequently raising the demand for low-skill (and female) workers. This is reflected in the higher relative wage that female workers can command with a

⁹ It is useful to note that the Stolper-Samuelson theorem is perfectly symmetric. Assuming again that in all countries women are largely low-skill workers and men high-skill, then trade liberalization will be expected to be associated with a reduction in the gender wage gap in developing countries and an increase in the gender wage gap in developed countries. The implication is that in the developed countries both trade liberalization and technological change will raise the gender wage gap. In developing countries technological change and trade liberalization work in opposite directions on the gender wage gap.

symmetrical downward shift in demand and wages for male workers (HS2). Thus a shift in the demand for male and female labor in a developing due to trade liberalization leads to a falling gender wage gap.

Figure 6: Changing Skill Intensity and the Gender Wage Gap in a Developing Country



Source: Adapted from Howell et al. (2001) based on Snower (1998).

There are a number of problems applying this model to the question of changes in the female intensity of employment, and Elson, Grown and van Staveren (2007, p. 35) write with skepticism that “mainstream trade theory would lead us to expect trade liberalization to contribute to reducing gender inequality in developing countries.”¹⁰ For

¹⁰ 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 Berik, Rodgers and Zveglic (2004). At a deeper level, the H-O model takes factor endowments as natural and thus given to economic analysis. Since gender discrimination cannot be presumed to be natural, it is hard to use the natural factor endowments model as the basis for analysis of a phenomenon so influenced by social norms. The notion that factors of production are the result of social

one, the Stolper-Samuleson prediction of the Heckscher-Ohlin model has failed most recent empirical tests in the case of developing countries.¹¹ Second, as we will see below, women in Latin America and in Southeast Asia are rapidly catching up to men in terms of educational attainment, and thus the application of the model to male and female labor is increasingly questionable, since gender difference in the model is based entirely on skill difference.¹² Third, the model assumes full employment. This precludes the possibility of women acting as a buffer labor force, as emphasized in a number of important studies of gender and globalization.¹³ And finally, the model assumes no market distortions. We argue in Section 5 below that occupational segmentation by gender is an important determinant of the female intensity of employment and that differences in the degree of gender segmentation and other institutional factors are an important part of any international comparison.

Despite these reasons for skepticism, the claim that the gender wage gap will influence the female intensity of employment remains widely held, perhaps because it is essentially an assertion of a downward sloping demand curve for male and female labor. It is also at the core of the economic theory of gender discrimination. Becker (1957) hypothesizes that greater competition between firms would make it more costly for those with a “taste for discrimination” to pay men a higher wage compared to women of equal skill. Firms that do not discriminate in this way will have lower costs and drive out those firms that do discriminate. The equilibrium outcome is the absence of discrimination,

processes has a long tradition even in trade theory (see Williamson, 1929), but is also the subject of considerable research in sociology and anthropology.

¹¹ See Arbache et al. (2004) and references therein.

¹² Rau and Wazienski (1999), for example, test the impact of industrialization on female labor force participation, defined here as the percentage of women in seven broad occupational categories, for a group of 62 countries for the years 1960-70. They find confirmation for a U-shaped curve suggesting that women’s participation declines in the early stages of industrialization and rises later.

¹³ Kucera (2001), Seguino (1997, 2000).

since discriminatory firms must either end their discrimination or fail. Bhagwati (2004) extends Becker's hypothesis to an open-economy context and asserts that increasing competition through trade with non-discriminating firms would similarly motivate discriminating firms to stop paying men a wage premium.

In this view the gender wage gap is endogenous, adjusting to eliminate employment discrimination against women through the mechanism of firm competition. Most research on gender and trade concerns the Becker hypothesis, assessing the dampening effect of trade liberalization on gender discrimination and the gender wage gap. Empirical studies have given conflicting results.¹⁴

Another strand of the gender and trade literature treats the gender wage gap as exogenous and export growth (or economic growth) as endogenous. In these studies, trade is not assumed to be based on relative factor abundance but on the ability of firms to compete over unit costs of production, or on the basis of absolute advantage. Women workers can create a competitive advantage for export-oriented firms that are engaged in price-cutting competition in the international market.¹⁵ For instance, Seguino (1997, 2000) argues that the gender wage gap was an important basis for the heavy reliance on female labor in the East Asian export expansion and rapid economic growth in the 1990s. Busse and Spielman (2006) find that the gender wage gap is statistically correlated with higher exports of labor-intensive goods in a sample of 92 countries. Mitra-Kahn and Mitra-Kahn (2007) report that the relationship between gender wage inequality and growth for 20 developing countries is non-linear: low-skill export manufacturing is

¹⁴ On the US, see Black and Brainerd (2004), Kongar (2007). On developing countries, see Berik (2000), Berik, Rodgers and Zveglich (2004), and Oostendorp (2004). On China, see Braunstein and Brenner (2007).

¹⁵ Elson (2007) pp. 6-7.

positively related to wage inequality while high-skill manufacturing is not.

Mitra-Kahn and Mitra-Kahn (2007) are exceptional in recognizing industrial upgrading as a mitigating factor (creating a non-linearity) in the relation between trade and female employment. They hypothesize that as countries shift away from cost-cutting export competitiveness, it no longer pays firms to discriminate, since the labor market is restructured, with workers better organized and having more choice in the labor market. This is also reminiscent of Ghosh's (2001) argument that as the labor market tightens, women begin to organize for better pay, benefits and working conditions which makes them a less attractive workforce for employers. The implication is that there is a downsloping demand curve for labor.

While there are vast amounts of research on gender and trade, there is scant evidence on the relation between the gender wage gap and the female intensity of employment.¹⁶ Do movements in the wage gap contribute to the feminization of manufacturing employment in Latin America and the defeminization observed in Southeast Asia? The international comparability of wage data is problematic for a number of reasons.¹⁷ We try to circumvent this problem by focusing on specific countries and using the ratio of female to male wages. Scatter plots of the gender wage ratio and female employment intensity (Figures 7a-7d) do not show any consistent pattern across countries in our sample. In Brazil and Thailand a narrowing wage gap is associated with rising female intensity. In Malaysia, the female intensity rises as the gender wage gap grows (figures are available only for 1985-1997). In Mexico, female intensity falls as the gender wage gap closes from 1996 to 2003, after which the quality

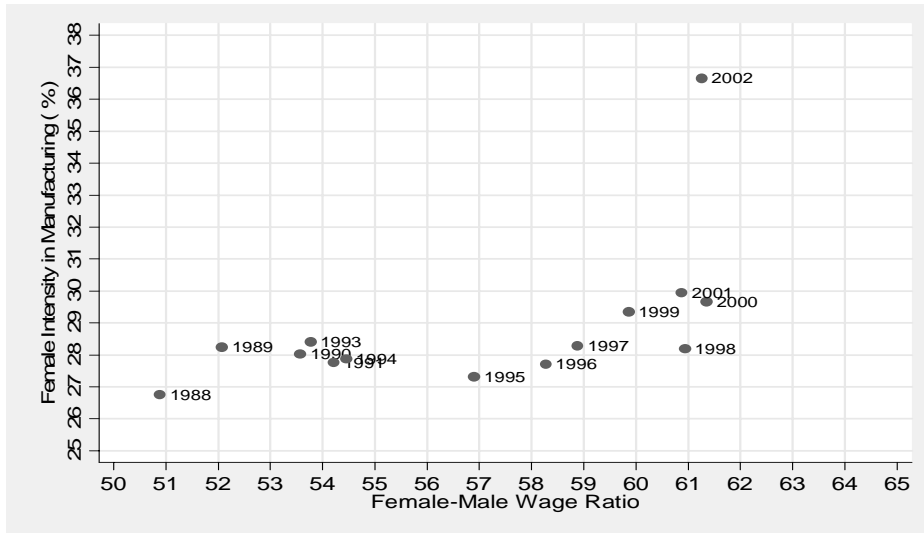
¹⁶ Two exceptions are Ozler (2000) and Kucera (2001).

¹⁷ 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.

of the wage data is questionable. Costa Rica and El Salvador, the other Latin American countries for which wage data are readily available show no clear relationship; the same is true of Indonesia and the Philippines. 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.

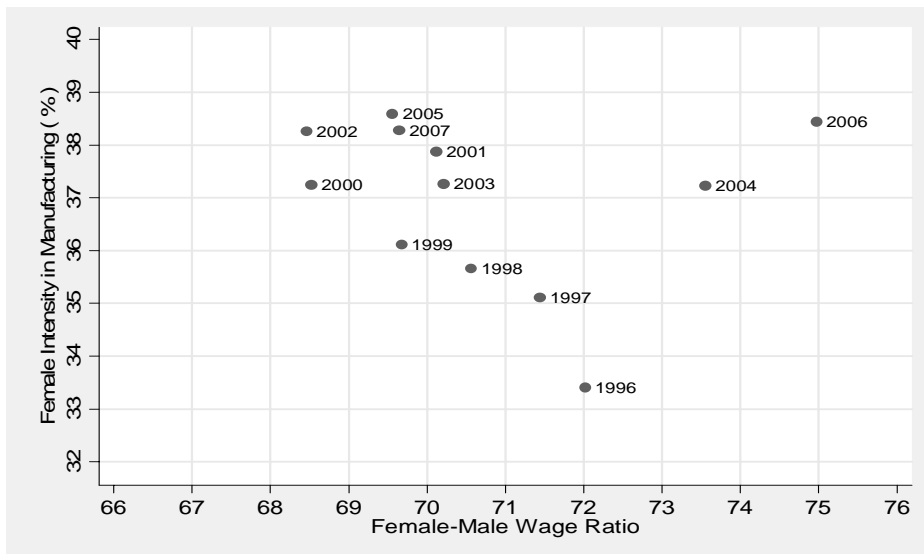
Figures 7A-7D: Female Intensity of Employment and the Gender Wage Gap, 1985-2007

Figure 7A: Brazil: Female Intensity and the Gender Wage Gap



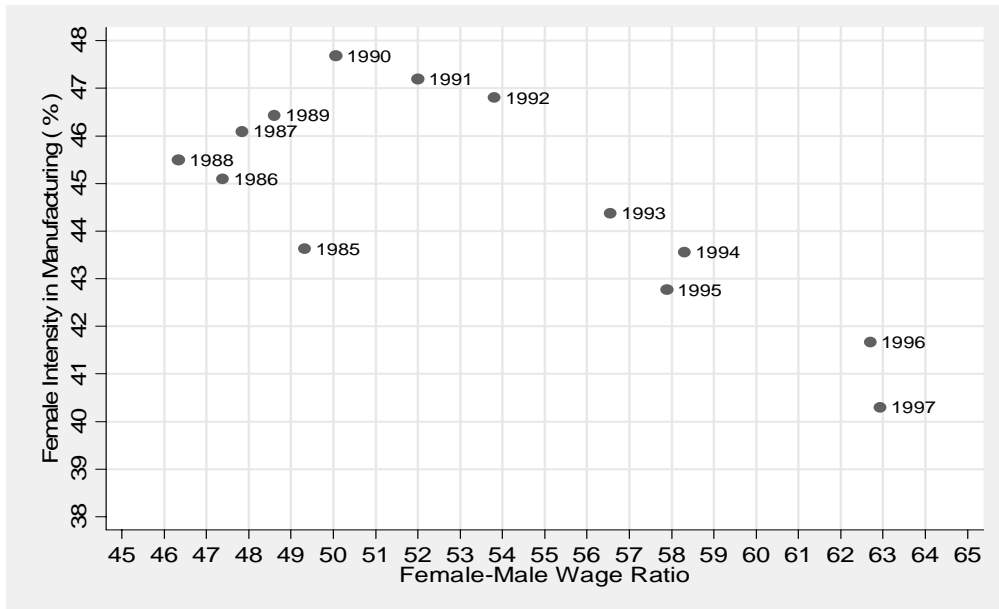
Source: Authors' illustration based on ILO (2009a).

Figure 7B: Mexico: Female Intensity and the Gender Wage Gap



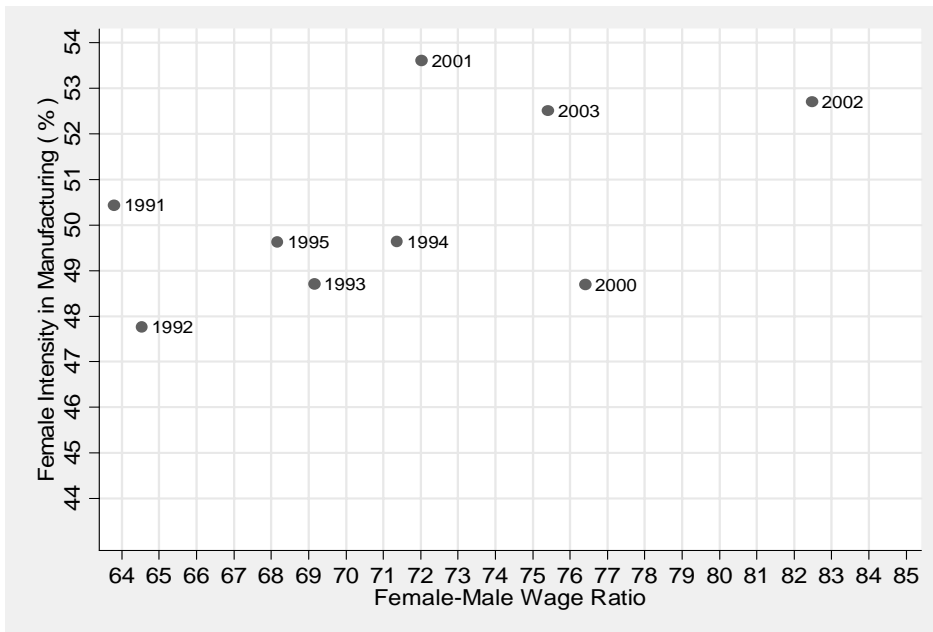
Source: Authors' illustration based on ILO (2009a).

Figure 7C: Malaysia: Female Intensity and the Gender Wage Gap



Source: Authors' illustration based on ILO (2009a).

Figure 7D: Thailand: Female Intensity and the Gender Wage Gap



Source: Authors' illustration based on ILO (2009a).

4. Industrial Upgrading and Gender-Biased Labor Demand Growth

The Heckscher-Ohlin model captures part of the process described by Standing, but export growth alone is not a particularly satisfactory explanation of global feminization. Despite impressive manufacturing export expansion in both Southeast Asia and Latin America, the two regions have experienced different trends in the female intensity of manufacturing employment. Changes in the gender wage gap are a particularly unreliable predictor of movements in female intensity of employment, as we saw above.

As Jomo (2009) argues, export growth *per se* was not the driver of feminization. The important issue is that export growth accelerated the shift into labor-intensive manufacturing. In this sense, Southeast Asia and Latin America have undergone very different industrialization processes and this, we find, is at the core of the different fates for women in manufacturing employment in the two regions. Of course international trade has long been tied to industrialization, and trade policy has been an important tool for economic development.¹⁸ Specifically, in this section we analyze the role of "industrial upgrading" in the determination of female intensity.

4.1 Industrial upgrading and female intensity of employment

The second tier-NICs of Southeast Asia -- Malaysia, Indonesia and Thailand -- not only successfully industrialized using export-oriented industrialization strategies in the 70s and 80s, but also upgraded their manufacturing sectors into higher value added activities using exports as a driver. Gereffi and Wyman (1990) characterize this first phase as primary export-oriented industrialization and the latter as secondary export-

¹⁸ See, for example, Amsden (1989) and Chang (2002), chapter 2.

oriented industrialization.¹⁹ Southeast Asia also successfully 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,²⁰ due to currency appreciation and withdrawal of the Generalised System of Preferences (GSP) under the GATT in the first-tier, and aided by low wages in the second.²¹ Now this labor-intensive manufacturing has moved to China as well as parts of Eastern Europe such as Romania and Poland.

In most of Latin America, on the other hand, import substitution industrialization remained the dominant policy approach through the 1970s.²² The 1980s were characterized as the "lost decade" on the continent, with rampant debt crises, double-digit inflation, financial distress and output losses.²³ 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% per year over the period 1991-2006 while that in Southeast Asia grew at 6% during the same period.²⁴ There are a number of complementarities between the growth of manufacturing exports and the growth of manufacturing value added. According to Kuwayama (2009, p. 31), apart from some Asian countries, in developing countries the ratio of manufactured exports to GDP has

¹⁹ According to Gereffi and Wyman (1990, p. 17), primary export-oriented industrialization involves the manufacture of labor-intensive products whereas secondary export-oriented industrialization "includes higher value-added items that are skill-intensive and require a more fully developed industrial base."

²⁰ Namely South Korea, Taiwan, Hongkong and Singapore.

²¹ Jomo (2009), p. 42

²² Mexico and Brazil experimented with export-oriented industrialization relatively early as compared to the rest of Latin America. Mexico commenced its Border Industrialization Program, which led to the creation of maquiladoras in 1965, though they began to comprise a significant share of manufacturing output only in the mid-90s as a result of NAFTA and the peso devaluation (Cooney 2001, qtd, in Caraway 2007). Similarly, the Caribbean nations of Puerto Rico and Dominican Republic (among others) also experimented with EPZs in the late 1960s (Caraway, 2007).

²³ Palma (2003).

²⁴ Lall et al (2004, p. 9) point out that from 1980-2000, the growth of MVA in Latin America was the slowest amongst all developing country groups (1.7%), coming in just behind Sub-Saharan Africa.

tended to rise rapidly from the 1980s onwards but the share of manufacturing value added in GDP has been stagnant; the sign of successful industrialization would imply that the latter outstrips the former.²⁵

In all the Latin American countries in our sample, save for Venezuela, the share of manufacturing value-added in GDP contracted over time, implying that they are experiencing *deindustrialization* prematurely, a point we return to in Section 6 below.²⁶ In the aggregate, manufacturing value added as a share of GDP in the Latin American large countries fell from 19% to 16% from 1984 to 2007; while the small countries slightly expanded their share from 16% to 18%. On the other hand, in Southeast Asia during the same time, the share of manufacturing value added in GDP increased from 21% to 29%, with Philippines being the only country which experienced a relative decline.²⁷ This is no doubt a reflection of the wide differences in manufacturing productivity between Latin America and Southeast Asia.²⁸

A number of authors have noted in passing the gendered nature of the change in labor demand as a result of a shift into more capital-intensive, technologically-sophisticated and higher value added production.²⁹ Standing (1999) himself observes that "the slight slippage [in feminization] in the Republic of Korea and Hong Kong may have something to do with the changing structure of industrial growth in such countries." (Standing 1999, p. 588). Mehra and Gammage (1999), citing research on South Korea by

²⁵ On a related note, Milberg and Winkler (2009) find that export growth and productivity growth are positively related on average for a sample of 30 developing countries.

²⁶ Venezuela expanded its share of manufacturing to around 18% of GDP in 2004, a level similar to that in 1985 after declines in the mid-90s. Argentina shows some gains in the early 2000s, but its share of manufacturing still remains much below that in the 1980s.

²⁷ Thailand expanded its share of manufacturing from 23% to 36%, Malaysia from 19% to 28% and Indonesia from 16% to 27% from 1984 to 2007.

²⁸ According to Lall, Albaladejo, & Moreira (2004), MVA per capita in Latin America in constant dollars declined by 7.8% from 1980 to 2000. East Asian MVA per capita rose 4.3 times over the same period.

²⁹ See Milberg and Winkler (2010) for an overview of the theory and measurement of industrial upgrading.

Kim and Kim (1995), note that "In some middle-income and developed countries, the demand for women's labor appears to be declining as export production is restructured and becomes technologized. More specialized skills are required and this often translates into an increase in the demand for male labor and a reduced demand for female labor." (Mehra & Gammage, 1999, p. 540). Joekes (1999) attributes defeminization more precisely to the shift in the industries operating within export processing zones in developing countries, noting that "As the composition of output of an EPZ changes towards more technologically sophisticated goods (such as automobiles, in the case of Mexico) the share of women workers in EPZs falls." Cling and Letilly (2001) associate the female intensity of female employment with the mismatch between skills demand and skills attainment by women:

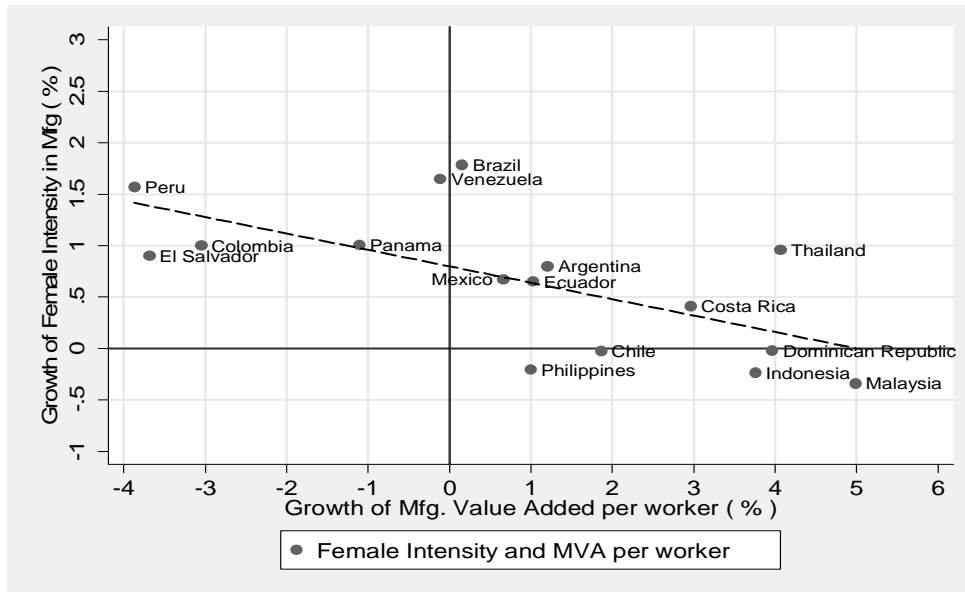
The educational level of the women relative to men in host countries is an important determinant of female intensity of employment. Whereas in Malaysia and Taiwan many of the technicians are women, the situation is very different in poorer countries; rather than retrain the largely female labor force already employed when the technological content of the production is increased, EPZs in these countries prefer to hire better qualified men (Cling & Letilly, 2001, p. 19)

According to Cling and Letilly (2001), the feminization of EPZ employment appears to have peaked and may be in decline, although because of China's share of global export processing zone employment, it is difficult to draw a conclusion without more detailed information on female intensity of EPZ work there. Jomo (2009) gives perhaps the most detailed analysis of defeminization in Southeast Asia and attributes it to the shift out of labor-intensive manufacturing and into more capital intensive and skill-intensive manufacturing in the 1980s (and services in the 1990s).

We use two broad measures as proxies of industrial upgrading in order to assess the relationship with female intensity of employment in Southeast Asia and Latin America:

capital intensity³⁰ and value added per worker in manufacturing. We find that the growth of manufacturing productivity, as measured by manufacturing value added per manufacturing worker, is negatively related to the growth of female intensity as shown in Figure 8.

Figure 8: Female Intensity of Manufacturing Employment and Manufacturing Value Added per Worker, average annual growth, 1985-2006



Note: a. Fitted Line: $Y = 0.86 - 0.13X$ (Adj. Rsq.= 0.24; t-stat = -2.38)
 b. Data availability varies by country. Please see Appendix B.
 Source: Authors' illustration based on ILO (2009a) and WDI (2009).

Southeast Asian manufacturing productivity grew much faster in the aggregate (3.5%) than Latin American large countries (0.26%) from 1991 to 2006 while female intensity grew in the former at (-0.2%)³¹ and the latter at (1.7%). All Southeast Asian countries, except for the Philippines, made impressive gains in manufacturing productivity as they shifted from primary to secondary export-oriented industrialization during 1985 to 2007 - Malaysia recorded an average annual growth rate of 5%, Indonesia and Thailand close

³⁰ The capital-labor ratio is the ratio of net fixed standardized capital stock (\$/year) and the number of workers (Extended Penn World Tables available at <http://homepage.newschool.edu/~foleyd/epwt/DataDoc3.0.htm>)

³¹ If Thailand is excluded female intensity over the period grew at -0.4%.

to 4%. In Malaysia and Indonesia this was associated with declining female intensity. Thailand was relatively late in its implementation of primary export-oriented industrialization, which expanded markedly in the decade of the 1980s;³² thereafter it departed from the general trend in the region and continued to feminize its manufacturing sector. Philippines has been a laggard in the region and although it experienced some feminization in the early 80s, in the period under consideration it displays sluggish manufacturing productivity and slight defeminization. It behaves more like a Latin American country in this respect, a parallel that has been remarked upon by other observers as well.³³

In Latin America, the cross-country dispersion of productivity growth is wider, with Chile, Dominican Republic and Costa Rica clustered along with the Southeast Asian countries on the south-east corner of the graph. The major economies in the region, Mexico, Brazil and Argentina experienced only modest gains in productivity over 1985-2006, which were accompanied by a rise in feminization. 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.³⁴ Employment in garments and electronic equipment accounts for its rising feminization during this period. Although Brazil, along with Mexico, is a major industrial centre in Latin America, its productivity in a number of traditional manufacturing industries such as footwear, apparel and

³² In 1989, female intensive industries including non-metallic mining, precious stones, food manufacturing, tobacco, wood, leather, leather products, rubber comprised 47.7% of GDP (Phananiramai, 1996, p. 282).

³³ Alonzo, Horton and Nayar (1996), p. 244 find that the percentage of female workers in manufacturing in the Philippines increased only two percentage points (from 38.1 to 40.7%) from 1978 to 1988, corroborating our findings. The Philippines was the only country in East Asia to experience a negative growth of GDP per capita in the region from 1980 to 1990 (World Bank 1992, cited in Alonzo, Horton and Nayar 1996).

³⁴ Kuwayama (2009).

furniture remains extremely low.³⁵ Peru and Colombia, both of which had strongly negative growth in manufacturing productivity, remain mostly primary product exporters and have limited manufacturing capabilities. On the other hand, Chile's success with industrialization is well documented and it is noteworthy that it never experienced a feminization in its manufacturing.³⁶ 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 till the mid-90s after which a slowdown in demand and severe competition from China led to major losses in market share. Costa Rica has been much more successful at diversifying and upgrading its exports than the Dominican Republic. However, the latter was more effective in expanding its share of value added in apparel exports than the former. Defeminization in Costa Rica from the late 90s onwards appears to be contiguous with its upgrading into medium and hi-tech exports.³⁷

Figure 9 presents a scatter plot of the average annual growth of capital intensity and female intensity of employment from 1985 to 2003. Again, the general pattern is confirmed: higher levels of capital intensity in production are associated with lower levels of female intensity. The regions also show broadly symmetric patterns: Southeast Asian production is becoming more capital intensive while that in Latin America is becoming less so. Declines were sharper during the period 1985 to 1995 in our Latin American large-country sample, with some recovery in Argentina, Brazil and Mexico and Peru in the following decade. Chile and Costa Rica, both well-known for their successful industrial upgrading experience, behave more like the Southeast Asian countries while

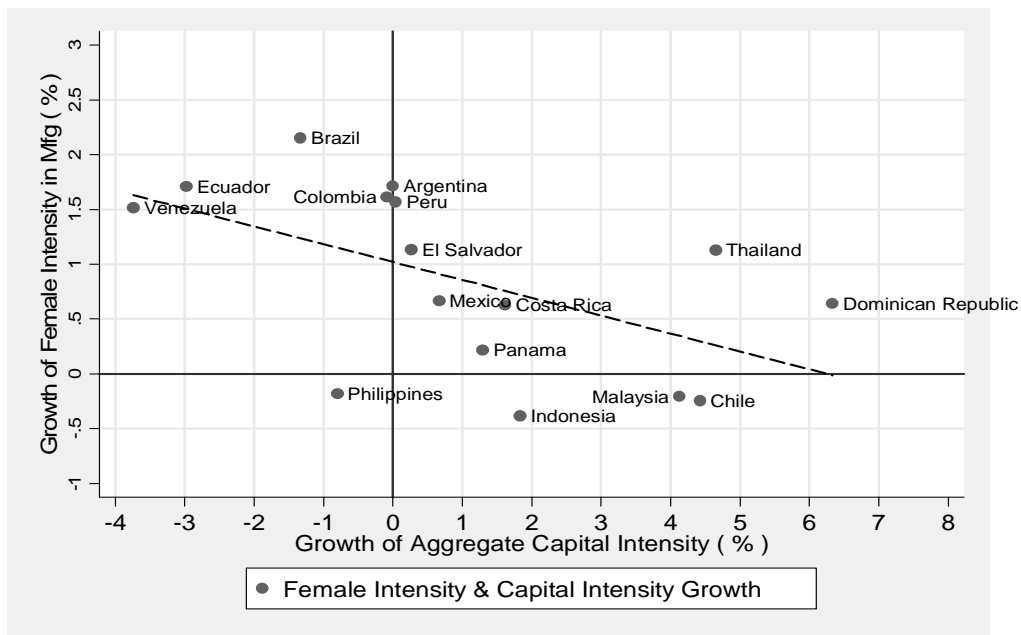
³⁵ The report points out that Korean MVA per employee is three times that of Brazil. See Kuwayama (2009), p. 37.

³⁶ Add cite

³⁷ Sanchez-Ancochea (2006), pp. 67, 997, 1004.

the Philippines is experiencing falling capital intensity and defeminization of manufacturing employment. Thailand is once again the exception in that it is becoming more capital intensive and yet its manufacturing employment is increasingly female. The Dominican Republic had significant growth in capital intensity, while growth in female intensity of employment was 0.6%.³⁸

Figure 9: Female Intensity of Manufacturing Employment and Capital Intensity, average annual growth, 1985-2003



Note: a. Fitted Line: $Y = 1 - 0.16X$ (Adj. Rsq = 0.25; t-stat = -2.43)
 b. Data availability varies by country. Please see Appendix B.
 Source: Authors' illustration based on ILO (2009a) and Marquetti (2009).

We do not conduct an empirical sectoral analysis of the particular industries that are driving the trends in feminization or defeminization in these two regions. Nonetheless, it is clear that there are two effects at work here: inter- and intra-industrial trends. By the former we mean the relative expansion or contraction of female-intensive industries that lead to a rise or fall in female labor demand and by the latter, shifts in feminization *within*

³⁸ The data for capital intensity has been restricted to the years 1996 to 2003 in the Dominican Republic for the sake of comparability with female intensity; capital intensity growth is closer to 3% for the period 1985-2003.

a particular industry that might reflect changing firm strategies. In Southeast Asia, defeminization appears to be related to the relative contraction of employment in particular female-dominated industries as compared to other manufactures: in Malaysia the employment shares of textiles, apparel, food products and rubber have decreased over time; in Indonesia too, the share of tobacco, footwear, food products and textiles in total manufacturing employment has dropped.³⁹ In Malaysia, this trend is compounded by defeminization *within* female intensive industries (including in textiles, wearing apparel, leather and footwear and electrical machinery)⁴⁰ while it is attenuated in Indonesia as the total share of employment in some female-intensive industries such as wearing apparel and leather has expanded. Thailand on the other hand displays a continuing feminization in the traditionally female sectors including textiles, tobacco, beverages, apparel as well as electrical machinery, though a break in the series after 1994 does not allow a satisfactory comparison of the total share of employment in these industries subsequently.⁴¹

In Latin America, although manufacturing has traditionally been a male preserve, women are now entering employment there as the sector contracts relative to GDP and its productivity declines. Thus, feminization here appears to be an intra-sectoral story, in that female intensity is increasing within particular industries as firms attempt to cut costs and increase competitiveness. The feminization we see in Latin America appears to be qualitatively different from that experienced in South-east Asia in the 1970s and 80s, which took place in the context of an expanding industrial sector, rising productivity and

³⁹ In Indonesia for instance, manufacturing output is diversifying with wood, furniture, paper, industrial chemicals and plastics.

⁴⁰ In the textiles industry in Malaysia, women's share of employment fell from 64% in 1985 to 42% in 2000

⁴¹ See Tables A3b, A3c and A3d in Jomo (2009).

rapid employment growth overall. While in Latin America, a generalized distress in the labor market prevails, with deep losses in traditional manufacturing jobs in mining, utilities and construction, especially in Brazil, Colombia and Venezuela. Informality is also on the rise, with six out of ten new jobs created between 1990 and 2003 situated in the unorganized sector.⁴² Since we measure total employment, our estimates also include informal employment, though we do not provide separate estimate for the same. Horton's (1996, p. 574) description of the feminization of clerical work in Japan, Malaysia and the Philippines in the 1970s and 80s could as easily apply to the case of Latin America today: "This process of feminization of occupations is often associated with a downgrading of status of these occupations and a decline in relative pay."

Due to limitations of data, it is not clear which industries within manufacturing are absorbing new female labor and this issue bears further investigation. It should be noted however that feminization in Latin America is continuing apace despite a declining share of "low-tech" activities in MVA in the region: its share of the same went from 20% to about 12% between 1980 and 2000 and is the lowest. The region's share of resource based and medium and high technology manufactures as a percentage of MVA also increased during this time (Lall, Albaladejo, & Moreira, 2004: 11).

4.2 Diagrammatic Summing Up

Our analysis so far involves four basic relationships among growth in female intensity (λ), capital intensity (κ), the female-male wage ratio (ω) and the growth of exports (χ). We can write these in three equations as follows:

⁴² Abramo and Valenzuela (2005).

$$(1) \quad \omega = f(\lambda, \chi),$$

$$(2) \quad \chi = g(\omega, \kappa, Y),$$

$$(3) \quad \lambda = h(\kappa, \omega, Y)$$

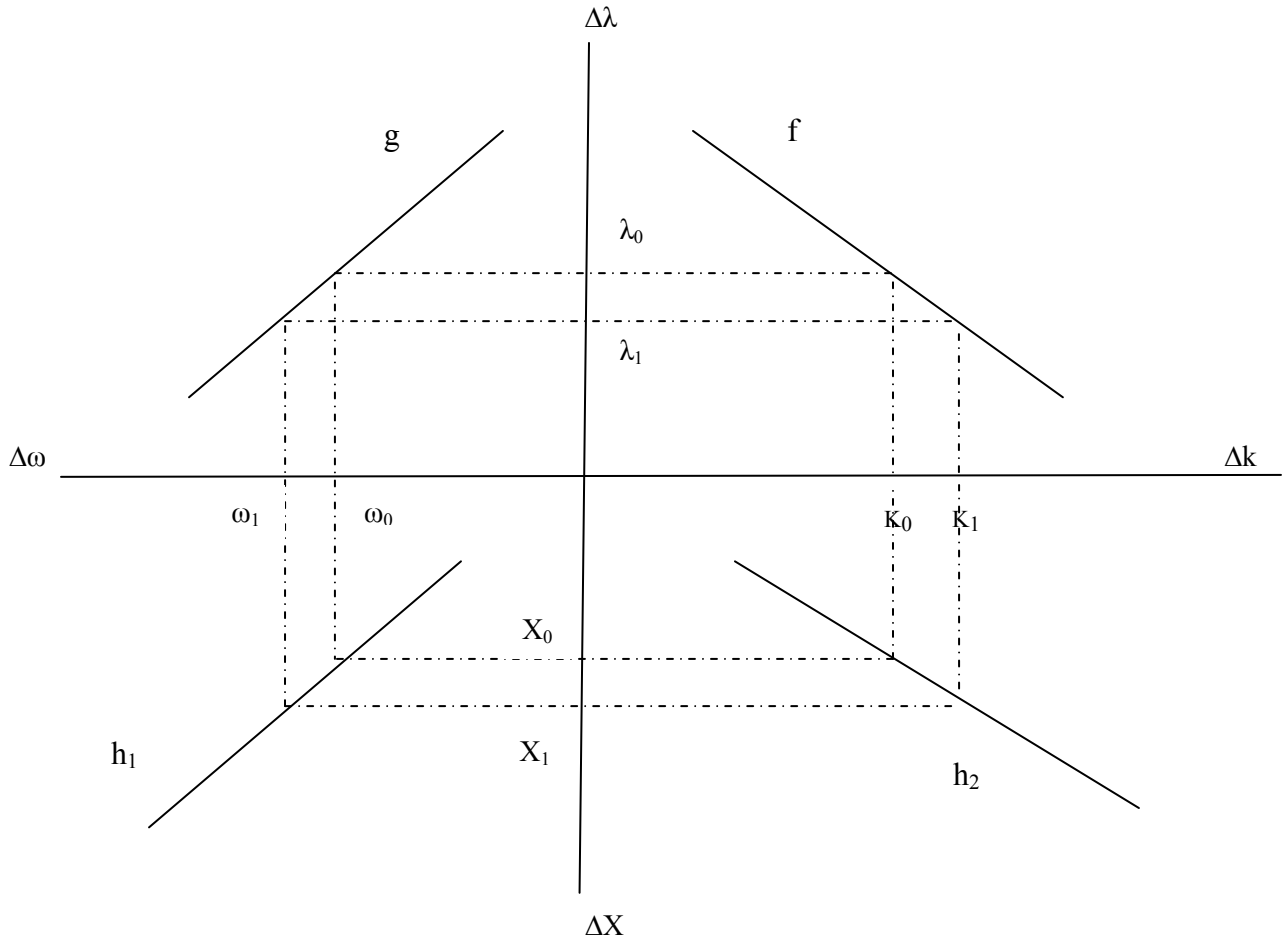
where Y is world income and other variables are as defined above. In equation (1) the gender wage gap is a function of the female intensity of employment. The two are expected to be inversely related, as postulated by Ghosh (2001). Equation (2) shows exports as a result of world income and relative prices, where prices are due in part to the gender wage gap and the level of capital intensity. A wider gender wage gap will presumably be associated with lower costs and thus greater export competitiveness, as found in studies by Busse et al. (2006) and Seguíno (2000). Equation (3) shows female intensity of employment as a function of the other variables, but the system is determined simultaneously.

Figure 10 brings together these various relationships combining hypotheses about the relationship between shifts in female intensity and changes in capital intensity (or industrial upgrading), the gender wage gap and exports. A central finding from the evidence presented above is that industrial upgrading (e.g. rising capital intensity) is associated with lower female intensity of employment, as illustrated in the north-east quadrant. In the south-east quadrant, a closing gender wage gap is associated with a falling female intensity of labor as the demand for women's labor falls when they are no longer a cheap factor of production relative to men. A downsloping curve in that quadrant is not implausible, since it captures the relation we find in some countries in our data sample in which a closing gender wage gap is associated with a higher demand for female labor -- Brazil and Thailand, for instance. Nonetheless, we leave the upsloping

curve in the Figure. The south-west quadrant depicts the Beckerian relation between the gender wage gap and the growth of exports, whereby greater competition through exports leads to the elimination of the gender wage gap. (Below we introduce an institutionalist version in which the gender wage gap in fact drives the growth in exports.) Finally, the south-east quadrant plots the relationship between capital intensity and exports, namely that industrial upgrading is associated with more rapid growth in exports. A simple exercise with the diagram is to trace the effect of a rise in the capital intensity of production. The rise from κ_0 to κ_1 is consistent with a rise in export growth, a bidding up of female wages relative to men and a fall in the growth of female intensity of employment.

The key relation in Figure 10 is that between capital intensity and the growth of female intensity. It could be interpreted to reflect the conventional skills-biased labor demand shift argument presented above in Figure 6, which would explain the ongoing feminization of manufacturing employment in Latin America and defeminization in Southeast Asia as the result of women's relative lack of skill. On the other hand, as we have shown, the negative relationship could also depict the prevalence of gender bias that leads to a lower demand for women's labor as production becomes more capital intensive, or as industries upgrade. The skill-biased labor demand analysis also presumes no change in the supply conditions of high-skill work by gender. The argument is essentially that women continue to lack the education in order to compete effectively for jobs that have higher skill intensity. We turn now to an explicit consideration of this issue.

Figure 10: Model of globalization and female intensity



Notes: k is capital intensity; λ is female intensity; ω is the gender wage gap (female/male) and X is exports
Source: Authors' illustration.

5. Education and Skills Attainment

In this section we look at indicators of educational attainment and find that the gains in education for women at all levels have been impressive. At higher levels of education, women's educational attainment tends to be higher than men's. As evident in Table 3, women's average years of schooling in Southeast Asia is generally lower than that in Latin America (the Philippines is the exception). Indonesia has the lowest level of female educational achievement in the whole sample. In Latin America, only in Mexico and Peru is the education gap between men and women more than 10 percentage points. In all other countries, men and women have attained very similar education levels.

What is striking in both regions is that women's enrollment in tertiary education, and to a lesser extent in secondary education, generally exceeds that of males (Table 4). The gains in Latin America in tertiary education are particularly impressive--see, in particular Argentina, Brazil, Dominican Republic and Panama--with Mexico and Peru being the only countries in which parity has not been achieved. In Southeast Asia, Malaysia and the Philippines have the highest level of secondary and tertiary enrollment, although Indonesia and Thailand have crossed the 100% mark as well. Thus the argument about a "skills mismatch" as an explanation of defeminization does not hold up particularly well for the middle-income countries. Over time, as women in both regions continue to make impressive gains in terms of education, the argument becomes even less compelling.

| Table 3: Ratio of Average Schooling Years, Female to Male Southeast Asia and Latin America, Middle Income Countries, 1970-1999 | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| East Asia | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 1999 |
| Indonesia | .47 | .48 | .58 | .65 | .63 | .70 | .75 |
| Malaysia | .35 | .42 | .42 | .58 | .67 | .81 | .85 |
| Philippines | .91 | .92 | .95 | .97 | .99 | .100 | .102 |
| Thailand | .67 | .76 | .77 | .81 | .83 | .85 | .88 |
| Latin America^a | | | | | | | |
| Argentina | .93 | .99 | .103 | .105 | .99 | .101 | .102 |
| Brazil | .83 | .87 | .91 | .91 | .98 | .99 | .98 |
| Chile | .94 | .93 | .96 | .98 | .98 | .98 | .99 |
| Colombia | .84 | .91 | .92 | .99 | .106 | .109 | .109 |
| Mexico | .54 | .59 | .82 | .82 | .86 | .87 | .88 |
| Peru | .66 | .69 | .73 | .74 | .79 | .82 | .84 |
| Venezuela | .81 | .86 | .90 | .92 | .96 | .97 | .98 |
| Latin America^b | | | | | | | |
| Costa Rica | .98 | .97 | .96 | .97 | .102 | .101 | .100 |
| Dominican Rep. | .86 | .89 | .90 | .88 | .89 | .93 | .102 |
| El Salvador | .59 | .64 | .76 | .78 | .91 | .94 | .98 |
| Ecuador | .82 | .86 | .87 | .85 | .86 | .90 | .94 |
| Panama | .92 | .96 | .99 | .105 | .102 | .104 | .104 |
| Notes: a: Large country sample. b: Small country sample. Source: Barro Lee (2009). | | | | | | | |

| Table 4: Southeast Asia and Latin America, Middle Income Countries | | | | | | |
|--|--------------|-------------|-------------|------------------|-------------|-------------------|
| Gross Enrollment Ratios, Female to Male | | | | | | |
| East Asia | Level | 1998 | 2000 | 2002 | 2004 | 2006 |
| Indonesia | Secondary | | .95 | .99 | .99 | .100 |
| | Tertiary | | | .87 | .79 | .99 ^c |
| Malaysia | Secondary | .109 | .108 | .100 | .112 | |
| | Tertiary | .107 | .106 | .125 | .126 | .122 |
| Philippines | Secondary | .109 | | .110 | .111 | .111 |
| | Tertiary | .132 | | .130 | .128 | .124 |
| Thailand | Secondary | | | .101 | .109 | .109 |
| | Tertiary | | .120 | .111 | .118 | .107 |
| Latin America^a | | | | | | |
| Argentina | Secondary | .106 | .104 | .103 | .110 | .112 |
| | Tertiary | .144 | .155 | .149 | .142 | .152 |
| Brazil | Secondary | | .110 | .110 | .110 | .111 ^c |
| | Tertiary | | .130 | .132 | .132 | .129 ^c |
| Chile | Secondary | .104 | .102 | .102 | .101 | .102 |
| | Tertiary | .88 | .92 | .93 | .95 | .100 |
| Colombia | Secondary | .111 | .110 | .111 | .111 | .111 |
| | Tertiary | .101 | .109 | .108 | .108 | .109 |
| Mexico | Secondary | | .102 | .104 | .103 | .102 |
| | Tertiary | | .93 | .94 | .94 | .93 |
| Peru | Secondary | .94 | .93 | | | |
| | Tertiary | | | .97 ^d | | |
| Venezuela | Secondary | | .120 | .116 | .114 | .112 |
| | Tertiary | | .146 | .109 | | |
| Latin America^b | | | | | | |
| Costa Rica | Secondary | .109 | .109 | .108 | .106 | .107 |
| | Tertiary | .118 | .120 | .116 | .125 | |
| Dominican Rep. | Secondary | | .123 | .121 | .121 | .120 |
| | Tertiary | | | | .159 | |
| El Salvador | Secondary | .99 | .99 | .101 | .102 | .104 |
| | Tertiary | .124 | .120 | .120 | .127 | .121 |
| Ecuador | Secondary | .104 | .102 | .101 | .100 | .102 |
| | Tertiary | | | | | .122 ^c |
| Panama | Secondary | .107 | .106 | .107 | .107 | .109 |
| | Tertiary | .155 | .169 | .170 | .166 | .162 |
| <p>Note: a: Large country sample; b: Small country sample. c: year=2007; d: year=2001. Source: WDI (2009).</p> | | | | | | |

6. Gender Norms and Occupational Discrimination

We have seen that the female intensity of manufacturing employment tends to fall as countries upgrade, enhance their productivity and engage in more capital-intensive production. But we have not answered the question of *why* technical change is associated with defeminization. Our educational data indicate it is not simply due to skill differences between men and women. In this section we argue that gender norms and stereotypes, as well as the resulting segregation of occupations by gender, play an important role in the trends of the feminization of employment. Distinct notions of “men’s work” and “women’s work” that are based on gendered notions of the differential abilities of the sexes persist to this day. These ideas influence firms’ hiring practices as well as the division of labor on the shopfloor. Anker (1998, p. 23) presents a number of common stereotypes about women that can explain employers’ preference or aversion to hiring female labor for particular types of occupations. For instance, stereotypes about women’s caring nature, greater manual dexterity and ability to do housework qualify them for service professions such as nurses and social workers as well as for monotonous work including knitting, weaving and sewing. On the other hand, the idea that women are physically weaker, reluctant to exercise authority and less adept at the hard sciences disqualifies them for “male” jobs such as construction workers, transport operators, engineers, etc (Anker 1998, p. 23). Similarly, Seguino (2006) finds that gender norms and attitudes are becoming less rigid as women become empowered economically and challenge them, she also recognizes the staying power of a gender bias in these norms.

In a study of Mexican maquiladoras Salzinger (2003) meticulously shows how gendered subjectivities are actually constituted on the shopfloor. This contrasts with the

idea that men or women already display the necessary gendered attributes that can simply be deployed in the interests of production. Of course the results of this constitution are contradictory and have implications for both the possibilities of resistance and for production but that need not detain us here. Caraway (2007) argues that gender is a “key organizing principle on the shopfloor” and that gender norms become embedded in institutions over time through gendered practices that then shape and structure relations of production (p. 30, 31). We agree with Caraway that the veracity of the stereotypes about women is irrelevant; what matters is whether employers believe them to be true. It is likely that as the nature of work changes due to a shift in the composition of output or greater use of capital-intensive techniques, as noted by other authors in Section 4.1, the preference for female labor declines due to gendered norms and practices. On the other hand, as Caraway (2007, p. 31) notes, firms tend to use feminization as a device for greater labor control and as a strategy to boost productivity under sub-optimal conditions --because they believe having the “wrong-gendered” person on the job reduces productivity. Thus feminization is related to a firm’s assessment that women have attributes that are required for the job, or that they are less costly, or both. The greater the competitive pressures on firms, the more likely they are to feminize, as long as the profile of work is consistent with gendered ideas about appropriate work for women. However, it is true that the gender typing of jobs is itself a fluid process and subject to change, as the boundaries between "male" and "female" work are redrawn over time. For instance, labor historians have documented how clerical, nursing and teaching occupations in the U.S. became feminized and segregated in the early twentieth century. Men did not leave these occupations but migrated to positions with more power and prestige.⁴³

43 See Walsh (1997), p. 573.

As feminist accounts have emphasized, the persistence of gender norms and stereotypes in the labor market is reflected directly in the segmentation of occupations by sex, which have a remarkable durability across regions and over time (see Mehra and Gammage, 1990). Sex segmentation of occupations is also influenced by factors such as barriers to entry due to the actions of labor market institutions, including male-dominated unions or government policy, and “pre-market discrimination” in education and training.⁴⁴ There is evidence that segmentation of the labor market does play a role in explaining the different levels of female intensity evident in Southeast Asia and Latin America manufacturing employment. Studies of the degree of segmentation in eight industrial categories in East Asia and Latin America find that labor markets in the former are much less segmented than in the latter.⁴⁵ Estimates of the Duncan Index,⁴⁶ which measures the degree of dissimilarity between male and female employment across sectors, range from 0.12 to 0.14 for the Southeast Asian countries in our sample over the 1970s and 80s, with a slight tendency for the index to rise over time.⁴⁷ For Argentina, Brazil, Colombia, Ecuador, Peru and Venezuela, the Duncan Index values range from 0.31 to 0.41 over the 1960s and 70s.⁴⁸ The relatively low segmentation in East Asia has been attributed to the fact that a larger proportion of females were active in agriculture (as compared to Latin America) and were thus mobilized as workers when labor demand shifted to manufacturing and services.⁴⁹

⁴⁴ See Milkman (1976), Milkman (1987), Rubery (1988), Badgett and Folbre (1999), ILO (2004b), Williams (1991), United Nations (1999).

⁴⁵ Horton (1999), Pscharapoulos and Tzannatos (1992). The eight categories are: agriculture, mining, manufacturing, utilities, construction, commerce, transport and services.

⁴⁶ A value of zero indicates an identical distribution across occupations for men and women, whereas a value of one implies completely dissimilar patterns.

⁴⁷ Horton, (1999) p. 575.

⁴⁸ Pscharapoulos and Tzannatos (1992).

⁴⁹ Horton (1996), p. 17.

There are other institutional factors that likely contribute to the low levels of female intensity in Latin America compared to Southeast Asia. One is governments' relatively late adoption of an export-oriented industrialization strategy. This was perhaps reflected in the relatively limited industrial upgrading there compared to Southeast Asia. Another factor is the strong presence of male-dominated unions that have kept women out of traditional manufacturing jobs.⁵⁰

Borrowing from Caraway's (2007) gendered political economy approach, we can hypothesize that feminization is the result of an increase in the demand for women's labor—related to the interaction between occupational segmentation and gendered discourse—that is also mediated by institutions and supply side variables. Though we do not examine the impact of institutions such as unions or labor market policies here, we have presented evidence on education in order to assess whether defeminization can be explained by women's relative lack of skills.

From a neoclassical perspective, the feminization of employment reflects the attenuation of discrimination. Neoclassical theory has no explanation for defeminization other than a decline in the quantity of female labor demanded in response to a relative price increase. Neoclassical and institutionalist theories are similar in their prediction that globalization will spur a feminization of employment in export-oriented sectors. They differ in their perspectives on the long run relation between these processes. The equilibrium in the neoclassical theory is the elimination of discrimination, at which point gender wage gaps will be nonexistent and the female intensity of employment will be based entirely on differences in skills (i.e. education, experience) and labor supply choices by men and women. Competition through trade liberalization will have worked

⁵⁰ Caraway (2007).

its way through the system. From the institutionalist perspective, feminization may be ongoing since the ability of firms to segment the market has no logical ending.

Standing (1989, p. 1086), for example, writes that:

Although much less so in Latin America than in other regions, not only do the data suggest that women are being substituted widely for men in various occupational categories, including manufacturing and production work in countries as diverse as Ghana, Swaziland, Bangladesh, and Costa Rica...but there are good reasons to suppose that substitution will continue as a long-term trend.

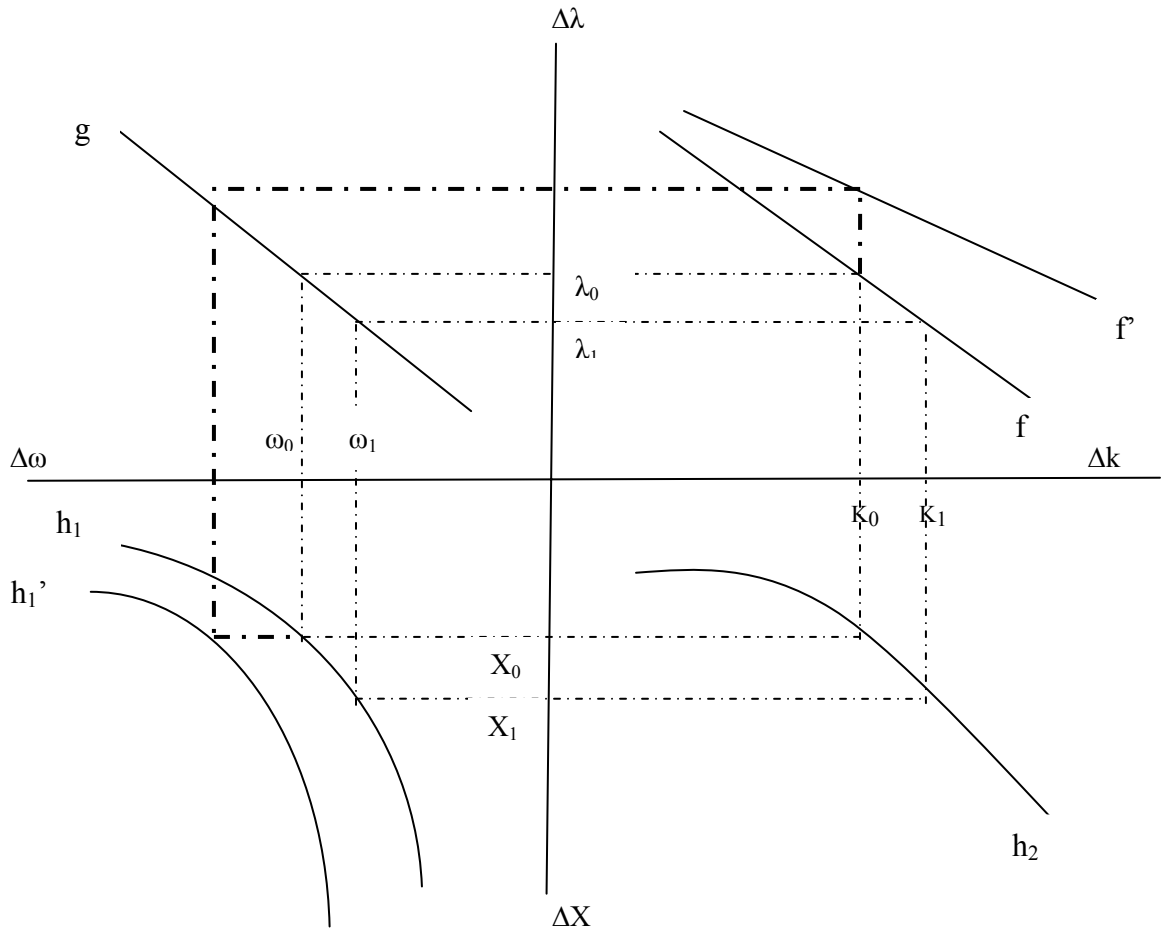
Institutionalists start from an assumption of the presence of labor market segmentation, viewing the economy in a dualistic fashion in which "primary sector" firms that enjoy relatively more market power and technologically advanced conditions of production are able to offer jobs with secure work tenure, better pay and benefits.⁵¹ Secondary sector firms face severe product market competition and generally create jobs with lower pay, fewer benefits and less security (Anker, 1997). Women tend to be crowded in particular segments of the secondary sector due to gender stereotypes of women's abilities and characteristics, as discussed earlier, as well as their intermittent labor supply.

Figure 11 illustrates the institutionalist perspective on female intensity. A rising female intensity is now associated with a narrowing wage gap (rising ω) and, following Seguino (1997, 2000) rather than Becker, higher export growth is associated with a greater wage gap (lower ω). In the Figure we also represent an easing of occupational segmentation, as a pivot in the curve relating capital intensity to the growth in female intensity (f to f') and of the curve relating export growth and the gender wage gap (h_1 to h'_1). In this case a given level of capital intensity (say κ_0) has a smaller negative effect on female intensity and thus on the gender wage gap with no change in the rate of growth of

⁵¹ Doeringer and Piore (1971).

exports. Similarly, an increase in capital intensity from κ_0 to κ_1 will have a much smaller negative impact on feminization if it occurs at the same time as a decline in occupational segmentation.

Figure 11: Institutionalist Model of globalization and female intensity



Source: Authors' illustration.

7. Beyond Manufacturing: Deindustrialization and Female Employment

Our focus to this point has been on manufacturing employment. But we know well that issues of female intensity of employment depend on overall structural change in the economy, in particular the growth and decline of different sectors. Over the last 20 years there have been significant shifts in the sectoral composition of GDP in developing economies, including deindustrialization in a number of countries. A growing proportion of women globally (46% in 2008) are now working in the service sector while industry accounts for a mere 18% of employed women in the world (ILO 2009, p. 10). The expansion of services, in particular, may be associated with feminization if women are segmented in "caring work" including personal and social services. In Latin America and the Caribbean, 77% of female employment is in the service sector, compared to 50% of male employment. The corresponding ratios for Southeast Asia are 40% and 33%.

So far we have focused on manufacturing but it is clear that trends in industry must be viewed in light of shifts in female employment occurring in agriculture and especially, services. Now we examine the impact of structural change, including shifts in sectoral productivity and output, on female intensity. While a comprehensive analysis of structural change is beyond the scope of this paper, we report here the results of a simple decomposition exercise based on the Kaldor-Verdoorn relationship. Kaldor (1966) and Verdoorn (1980) modeled employment growth as the result of the difference between output growth and labor productivity growth; we amend this formulation to obtain the impact of productivity and growth on female employment. The analysis captures the dynamics in each sector--agriculture, industry and services--in order to understand the impact of structural change on female intensity in the overall economy. Let θ_t stand for

the share of female employment in total employment at time t. The growth of female intensity of employment in the overall economy $\hat{\theta}$ is an average of the contribution of each sector to total female intensity, weighted by the sectoral shares of total female employment.⁵² Further, the contribution of each sector to the growth of aggregate female intensity is the result of: i) output or demand growth per worker (χ_i) ii) labor productivity growth (ξ_i) and iii) sectoral female intensity. (See Appendix C for details).

If F_t is female employment, T_t is total employment, X_t is output at time t, and $F_t = \sum_i F_{it}$ $T_t = \sum_i T_{it}$ $X_t = \sum_i X_{it}$ for sectors $\{i...n\}$

Female intensity of employment at time t is :

$$\theta_t = \frac{F_t}{T_t} \quad (4)$$

$$\text{If } \chi_i = \frac{X_i}{T} \quad \xi_i = \frac{X_i}{T_i}$$

$$\hat{\theta} = \sum_i \frac{F_i}{F} [(\hat{F}_i - \hat{T}_i) + (\hat{\chi}_i - \hat{\xi}_i)] \quad (5)$$

$$\hat{\theta} = \sum_i \frac{F_i}{F} [(\hat{F}_i - \hat{T}_i) + (\hat{X}_i - \hat{T}) - (\hat{X}_i - \hat{T}_i)] \quad (6)$$

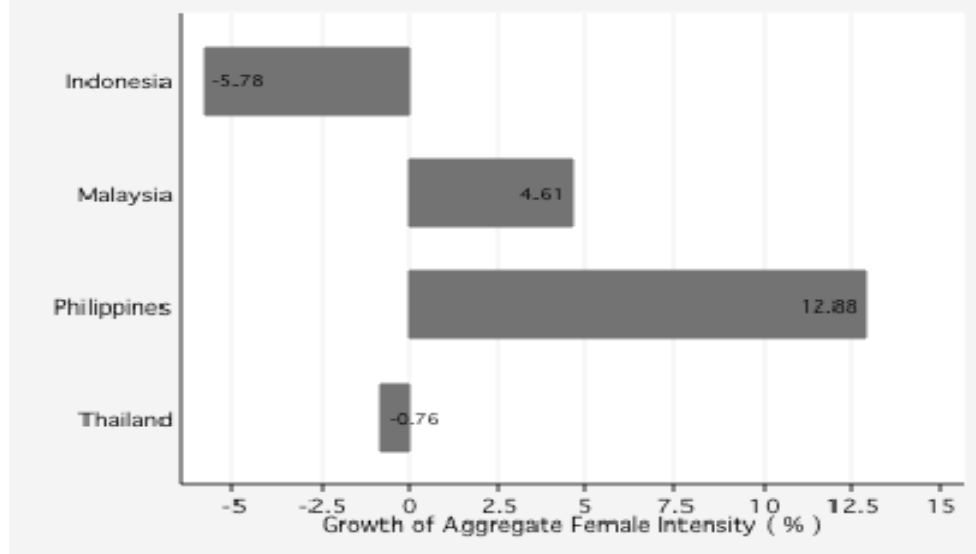
We see in (6) above that the growth of aggregate female intensity is equal to the weighted sum of output growth less productivity growth plus female intensity in each sector.

Figures 12 -17 present the key results of the decomposition exercise. In both Southeast Asia and Latin America, aggregate female intensity grew over the period 1991 to 2007, though much faster in Latin America (Figure 12 and 13). Aggregate female intensity fell only in Indonesia and Thailand, the latter is especially surprising given that feminization in manufacturing has been positive over this period. As we saw earlier, the

⁵² Ocampo, Rada and Taylor (2009).

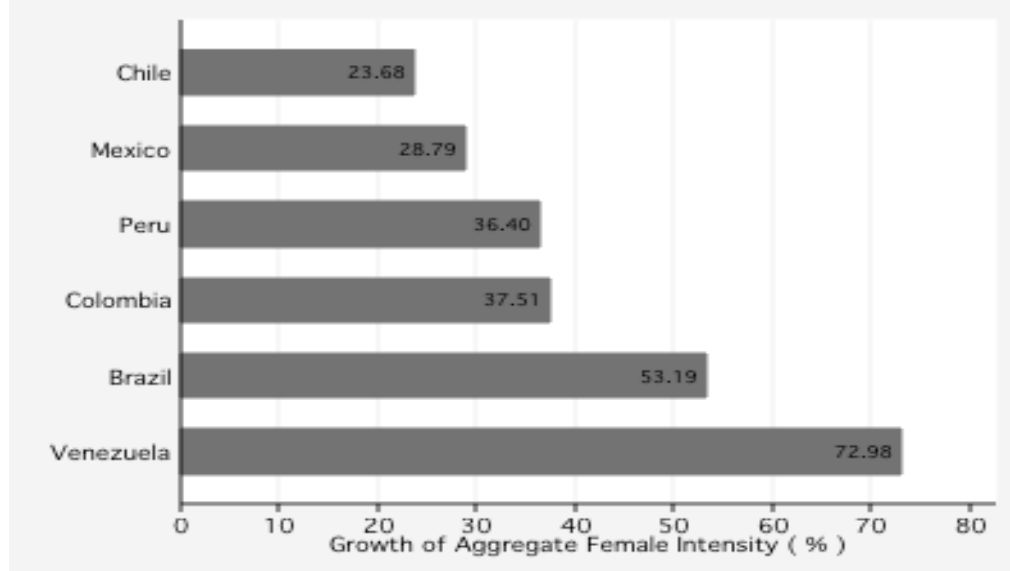
Philippines had stagnant growth in the feminization of manufacturing employment, though in the aggregate its female share of employment increased the most rapidly amongst the Southeast Asian nations and is driven by services.

Figure 12: Growth of Aggregate Female Intensity, Southeast Asia, 1991 to 2007 (%)



Source: Authors' illustration based on GET (2009).

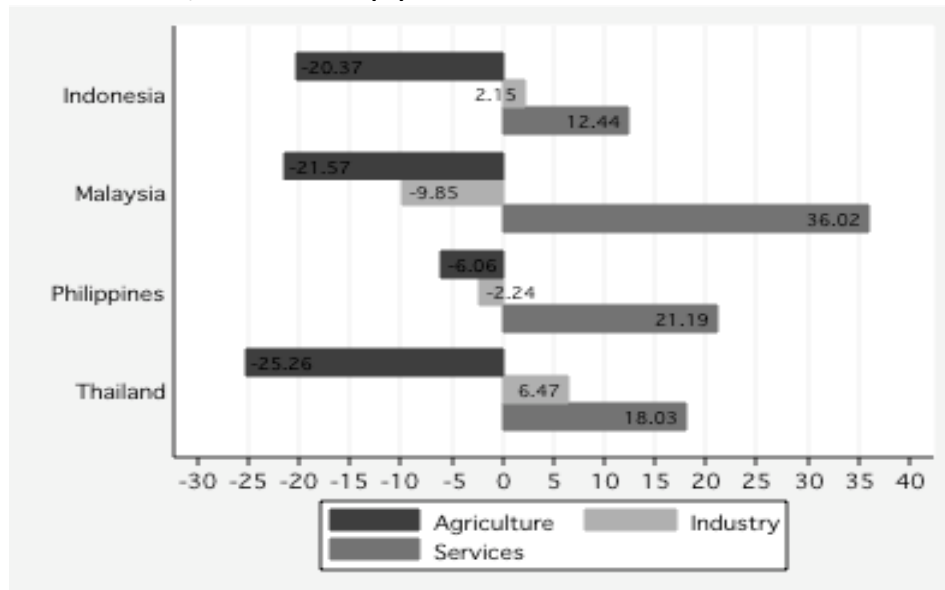
Figure 13: Growth of Aggregate Female Intensity, Latin America, 1991 to 2007 (%)



Source: Authors' illustration based on GET (2009).

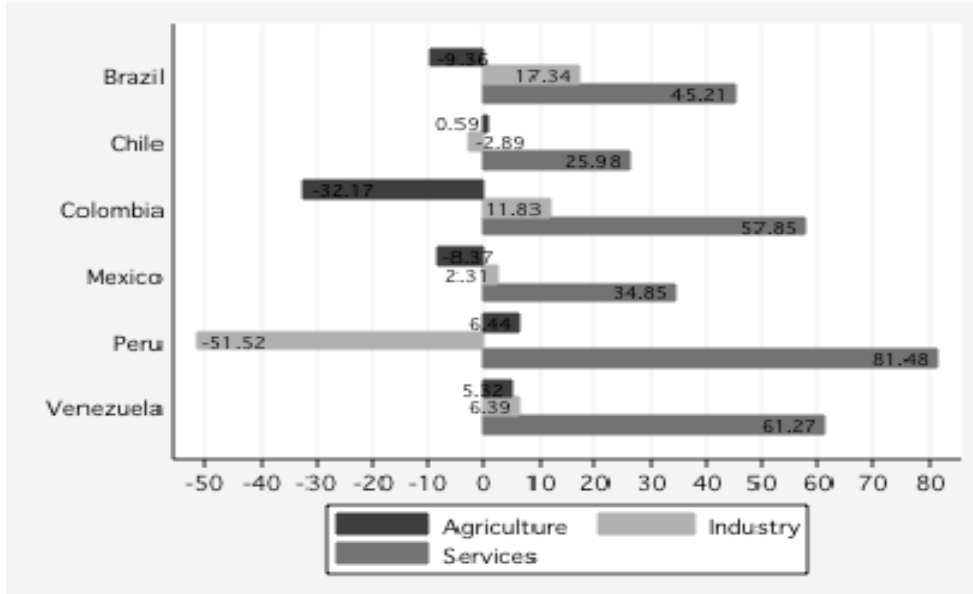
As evident in Figure 14, the decline of women's employment in agriculture in Thailand and Indonesia more than offset the gains in industry and services and resulted in a falling share of female employment. The contribution of services to rising female intensity in Malaysia (36%) and the Philippines (21%) is particularly noteworthy; while again industry in Thailand, and Indonesia to a lesser extent, contributed positively to female intensity. In both regions, and especially in Latin America, services contributed the most to the growth of female intensity of employment, while agriculture in the latter was insignificant in its contribution to the growth of female employment (see Figures 14 and 15).

Figure 14: Sectoral Contribution to Aggregate Female Intensity, Southeast Asia, 1991 to 2007 (%)



Source: Authors' illustration based on GET (2009).

Figure 15: Sectoral Contribution to Aggregate Female Intensity, Latin America, 1991 to 2007 (%)

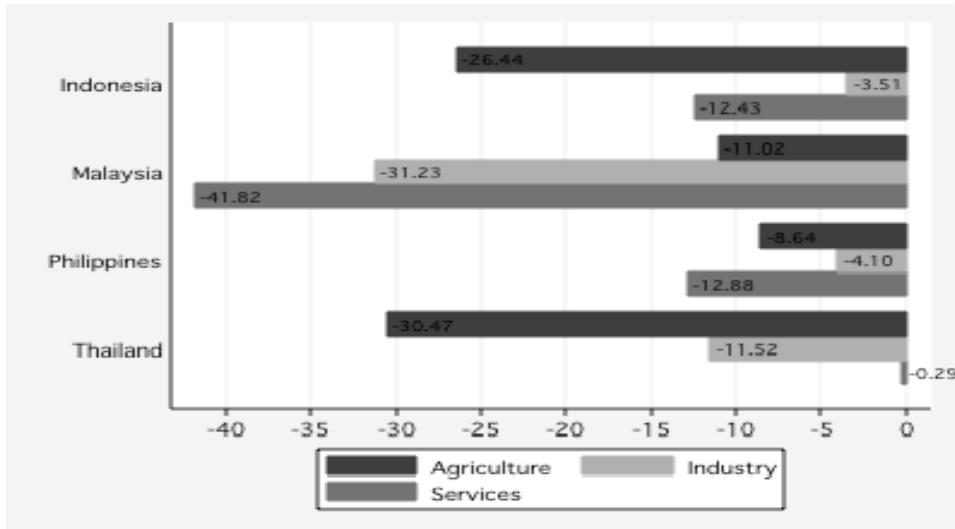


Source: Authors' illustration based on GET (2009).

In Southeast Asia, productivity gains had a strong negative impact on female employment growth in all sectors (Figure 16). The rapid expansion of services output (though not industry) still led to net positive employment outcomes for women in that sector. In Latin America, much the reverse situation exists: changes in productivity made a positive, or weakly negative, contribution to aggregate female intensity growth (Figure 17). This was not the case in Chile, which experienced high overall productivity gains and in Peru, where the rapid growth of industrial productivity appears to be inconsistent with its experience.

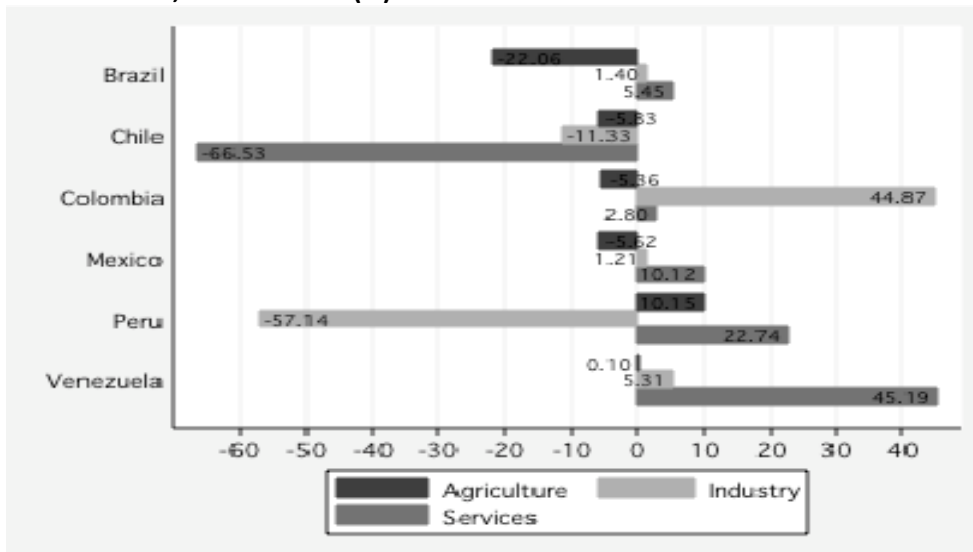
Figure 16: Productivity Contribution to Aggregate Female Intensity,

Southeast Asia, 1991 to 2007 (%)



Source: Authors' illustration based on GET (2009).

Figure 17: Productivity Contribution to Aggregate Female Intensity, Latin America, 1991 to 2007 (%)



Source: Authors' illustration based on GET (2009).

In sum, we learn from the decomposition exercise that female intensity is rising in Latin America not only in manufacturing but in the aggregate as well, and at a much faster rate than in South-east Asia. Aggregate female intensity of employment in the major Latin American countries has surpassed that in South-east Asia and it is driven by the growth of services and to a lesser extent, by industry. Although nearly all South-east Asian countries are experiencing a defeminization in manufacturing, Malaysia and the Philippines display a rising female intensity in the aggregate --also driven by services. Thailand and Indonesia are defeminizing due to a contraction of employment in agriculture. We confirm our earlier finding that the different rates of productivity growth in South-east Asia and Latin America have implications for the feminization of labor. This exercise, rather than focusing only on manufacturing, highlights the importance of taking the aggregate picture into account.

8. Conclusion: Explaining Feminization and Defeminization

The observation of continued feminization of manufacturing employment across Latin American middle-income countries and a gradual defeminization in Southeast Asia poses a theoretical challenge since most research in this field has focused on the issue of feminization and not its reversal.⁵³ From our observation of these regional trends, we built a general framework that explains both feminization and defeminization. In our first pass, we argued that export expansion alone is an inadequate explanation for shifts in female intensity, since both regions exhibit impressive export growth. There is no doubt that export growth in many developing countries since the mid-1980s has brought an expansion of low-skill labor intensive and female-intensive manufacturing industries,

⁵³ Note that there is a long tradition of non-linear analysis in feminist economics, beginning with Boserup's (1971) U-curve relation between industrialization and female labor force participation.

spurred in many cases by export promotion in EPZs. We found that continued feminization of manufacturing employment in Latin America was due to the low levels of female intensity and slower industrial upgrading. Conversely, the observed defeminization in Southeast Asia was found to be due to the high levels of female intensity achieved in the 1980s and the dramatic industrial upgrading experienced in the region in the last couple of decades.

One possible reason for this correlation is the anti-female bias in labor demand changes that result from output shifts in developing countries that are successful in upgrading their industry out of low-skill intensive manufacture and into higher-tech production. The so-called "high-road" of industrialization would thus be associated with defeminization while the "low road" associated with continued heavy reliance on low-paid women. The gender wage gap is not systematically related to female intensity of employment, within countries or across countries. We then tried to expand the framework to include educational attainment and especially differences in occupational segmentation across regions and countries.

A final issue worth mentioning here is that significant amounts of female labor are hidden and thus are not picked up by survey data. A number of studies make a link between the emergence of global value chains and the rise of different types of subcontracting and home-based work, suggesting that women who might have been formerly employed in factories in EPZs could be doing home-based work for lower wages and no benefits.⁵⁴ Other studies have argued that the evidence of defeminization in the 1990s and 2000s is suspect because it is based on firm surveys that only include companies with 10 or more employees. Women are much more likely than men to be

⁵⁴ Carr and Chen (2004), Balakrishnan (2001), Barrientos (2008).

employed in small firms (less than 10 employees) or in home-based work.⁵⁵ This is an area for future research, requiring field work. Another potentially fruitful area of research would be to analyze intra-manufacturing shifts in output, employment and feminization to see more precisely how sectoral trends are influencing the overall picture in manufacturing.

⁵⁵ Ghosh (2001), Mehra and Gammage (1999), Abramo and Valenzuela (2005).

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| 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 Rep. |
| 10 | Hongkong | 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, Rep. | 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 & Tobago | 28 | South Africa |
| 29 | U.K. | 29 | Thailand |
| 30 | United States | 30 | Turkey |
| | | 31 | Venezuela |
| | | 32 | Pakistan ^a |
| Note: a. Low income country | | | |

| Appendix B: Sample Countries by Region & Start and End Years for Female Employment Data | | | | | | | |
|--|-----------------|-------------------|-----------------|---------------------------------------|----------------|-------------------|-----------------|
| | Country | Start Year | End Year | | Country | Start Year | End Year |
| East Asia & Pacific | | | | Middle East & North Africa | | | |
| 1 | China | 1987 | 1999 | 1 | Egypt | 1984 | 2006 |
| 2 | Hongkong | 1984 | 2007 | 2 | Morocco | 1990 | 2006 |
| 3 | Indonesia | 1985 | 2007 | Other Industrialized Countries | | | |
| 4 | Japan | 1984 | 2007 | 1 | Australia | 1984 | 2007 |
| 5 | Korea, Rep. | 1984 | 2007 | 2 | Canada | 1984 | 2007 |
| 6 | Malaysia | 1984 | 2007 | 3 | New Zealand | 1986 | 2007 |
| 7 | Philippines | 1984 | 2007 | 4 | United States | 1984 | 2007 |
| 8 | Singapore | 1984 | 2007 | | | | |
| 9 | Thailand | 1984 | 2007 | | | | |
| Europe & Central Asia | | | | Western Europe | | | |
| 1 | Azerbaijan | 1999 | 2007 | 1 | Austria | 1984 | 2007 |
| 2 | Croatia | 1996 | 2007 | 2 | Denmark | 1984 | 2007 |
| 3 | Czech Republic | 1993 | 2007 | 3 | Finland | 1984 | 2007 |
| 4 | Estonia | 1989 | 2007 | 4 | Germany | 1991 | 2007 |
| 5 | Georgia | 1998 | 2007 | 5 | Greece | 1984 | 2007 |
| 6 | Hungary | 1994 | 2007 | 6 | Iceland | 1991 | 2007 |
| 7 | Latvia | 1996 | 2007 | 7 | Ireland | 1984 | 2007 |
| 8 | Lithuania | 1998 | 2007 | 8 | Italy | 1984 | 2007 |
| 9 | Moldova | 2000 | 2007 | 9 | Netherlands | 1985 | 2007 |
| 10 | Poland | 1994 | 2007 | 10 | Norway | 1984 | 2007 |
| 11 | Russia | 1997 | 2007 | 11 | Portugal | 1984 | 2007 |
| 12 | Slovakia | 1994 | 2007 | 12 | Spain | 1984 | 2007 |
| 13 | Slovenia | 1993 | 2007 | 13 | Sweden | 1984 | 2007 |
| 14 | Turkey | 1984 | 2007 | 14 | Switzerland | 1984 | 2007 |
| Latin America & Caribbean | | | | 15 | U.K. | 1984 | 2005 |
| 1 | Argentina | 1991 | 2006 | South Asia | | | |
| 2 | Bahamas | 1986 | 2007 | | | | |
| 3 | Brazil | 1984 | 2006 | 1 | India | 1984 | 2005 |
| 4 | Chile | 1984 | 2007 | 2 | Pakistan | 1985 | 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 | | | | |

Appendix C: Decomposition Exercise

If F_t is female employment, T_t is total employment and X_t is output at time t, then $\theta_t = F_t/T_t$ or female intensity at time t.

$$\sum_i F_{it} = F_t, \quad \sum_i T_{it} = T_t \text{ and } \sum_i X_{it} = X_t \text{ for sectors } \{i \dots n\}$$

$$\theta_t = \sum_i \left(\frac{F_{it}}{X_{it}} \right) \left(\frac{X_{it}}{T_t} \right)$$

$$\theta_t = \sum_i \left[\left(\frac{T_{it}}{X_{it}} \right) \left(\frac{F_{it}}{T_{it}} \right) \right] \left(\frac{X_{it}}{T_t} \right)$$

$$\theta_t = \sum_i \left(\frac{F_{it}}{T_{it}} \right) \left[\left(\frac{T_{it}}{X_{it}} \right) \left(\frac{X_{it}}{T_t} \right) \right]$$

Let $A_{it} = \frac{F_{it}}{T_{it}}$ and $B_{it} = \frac{X_{it}}{T_t} \cdot \frac{T_{it}}{X_{it}}$

Then $\theta_t = \sum_i A_{it} B_{it}$

We know that :

$$\frac{d}{dt} \sum_i A_{it} = \sum_i \frac{F_i}{T_i} (\hat{F}_i - \hat{T}_i)$$

$$\frac{d}{dt} \sum_i B_{it} = \sum_i \frac{T_i}{T} (\hat{\chi}_i - \hat{\xi}_i)$$

where $\chi_i = \frac{X_i}{T}$ $\xi_i = \frac{X_i}{T_i}$

After grinding $\hat{\theta} = \sum_i \frac{F_i}{F} (\hat{A}_i + \hat{B}_i)$

$$\hat{\theta} = \sum_i \frac{F_i}{F} [(\hat{F}_i - \hat{T}_i) + (\hat{\chi}_i - \hat{\xi}_i)]$$

$$\hat{\theta} = \sum_i \frac{F_i}{F} [(\hat{F}_i - \hat{T}_i) + (\hat{X}_i - \hat{T}) - (\hat{X}_i - \hat{T}_i)]$$

Note : With given T_i , $\sum_i \hat{B}_i = 0$

But $\sum_i \frac{F_i}{F} \hat{B}_i \neq 0$