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Working Paper

Gender Inequality and Trade

HWWA Discussion Paper, No. 308

Provided in Cooperation with:
Hamburgisches Welt-Wirtschafts-Archiv (HWWA)

Suggested Citation: Busse, Matthias; Spielmann, Christian (2004) : Gender Inequality and Trade, HWWA Discussion Paper, No. 308, Hamburg Institute of International Economics (HWWA), Hamburg

This Version is available at:
https://hdl.handle.net/10419/19280

HWWA HAMBURG

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Hamburgisches Welt-Wirtschafts-Archiv (HWWA)
Hamburg Institute of International Economics
2005
ISSN 1616-4814

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The authors benefited from very helpful suggestions and comments from World Bank trade seminar participants, Maurice Schiff, Marcelo Olarreaga, Gita Gopel, Carsten Hefeker, and would like to thank Karsten Reichel for his excellent research assistance. All remaining errors are, of course, our own.

Edited by the Department World Economy

HWWA DISCUSSION PAPER 308
January 2005

Gender Inequality and Trade

ABSTRACT

The paper empirically explores the international linkages between gender inequality and trade flows of a sample of 92 developed and developing countries. The focus is on comparative advantage in labour-intensive manufactured goods. The results indicate that gender wage inequality is positively associated with comparative advantage in labour-intensive goods, that is, countries with a larger gender wage gap have higher exports of these goods. Also, gender inequality in labour force activity rates and educational attainment rates are negatively linked with comparative advantage in labour-intensive commodities.

JEL classification: F11, F16, J70, J80

Key words: Gender Inequality, Trade, Comparative Advantage

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1. Introduction

Over the last couple of decades, gender equality across countries declined significantly. While this has led to better opportunities for women, in particular in industrialised countries, gender bias in education and the labour market still exist and equality is still a faraway goal in a number of countries. The consequences of gender inequality, particularly in education, on economic growth rates has been analysed in depth by, for instance, Drèze and Sen (1989), Pritchett and Summers (1996), and Klasen (2002). Yet there is also concern that gender inequality may affect the (cost) competitiveness of countries by lowering (female) wages, thereby influencing trade flows. Along these lines, gender inequality has been debated within a wider range of topics related to basic labour standards, which also include child and forced labour as well as union rights. In particular, fears have been stated that there might be a "race to the bottom" on such standards (OECD, 2000). Rich countries like those of the European Union and the United States have insisted on the inclusion of binding rules within the World Trade Organisation (WTO) to ensure a level playing field and to deal effectively with fundamental workers' rights. Developing countries, on the other hand, fear that high-income countries are likely to excuse protectionist trade measures against foreign competition by accusing their low-cost competitors of abusing labour standards.

How could a gender bias influence trade flows? In a standard Heckscher-Ohlin trade model, using capital and labour as the main production factors, the impact depends on changes in relative factor endowments. If two (developing) countries both have a relatively large workforce, then an enlargement in the supply of labour by, for instance, an increase in the female labour force in only one country would lead to an improvement in its comparative advantage in labour intensive products. Note that standard international trade theory does not address wage inequalities, since it assumes that these do not exist in highly competitive markets, at least in the long run. According to Becker (1971), gender wage gaps may occur if employers have, for instance, a preference for discrimination (based on socio-cultural habits) and are able and willing to afford it, as the firm will be worse off. In an open economy, trade would lead to increased competition, making it

much more costly for employers to discriminate. As a consequence, gender wage gaps which cannot be explained by differences in educational attainment are likely to be reduced.

Yet we do observe gender inequality in wage remuneration not only in closed, but also in more open economies, which raises some concern about the fundamental assumptions in neoclassical trade models and places emphasis on the importance of exploring the linkages between gender inequality and international trade. Oostendorp (2004), for example, finds that increased trade narrows the wage gap for unskilled labour in both developing and developed countries, but this does not apply to skilled labour. Focusing on the United States, the results reported by Black and Brainerd (2004) support the prediction that increased competition from trade benefits females by reducing employers' power to discriminate.[1]

On the other hand, the results reported by Seguino (1997, 2000b), who analyses the link between gender wage inequality and export (and growth) performance in a number of semi-industrialised, export-oriented countries, show that gender imbalances may have contributed to the export success of several countries. Also, Berik et al. (2004) examine the trade performance of (South) Korea and Taiwan (China), two highly open economies, and find that competition from trade in competitive industries is positively associated with wage discrimination against females in these two countries. In a further study, Osterreich (2002) demonstrates that gender wage gaps are negatively related to the terms of trade for manufactured goods in semi-industrialised countries, that is, more discrimination leads to lower export prices and a worsening of the terms of trade.

Regarding the female labour supply, Busse (2002) shows that trade flows and the female activity rate might be associated to some extent, but he focused his analysis more on basic labour standards. Similarly, other studies analysed the impact of increasing globalisation on female employment (Wood, 1991; Standing, 1989, 1999; Kucera and Milberg, 2000). In general, an enlargement in trade might increase the number of jobs available for

[1] See also the literature surveys by Cagatay and Ertürk (2004) and UNCTAD (2004).

females and/or fosters the concentration of females in export-oriented industries. Conversely, Joekes (1995) notes that the percentage of (unskilled) females in the labour force might peak at a certain level and then fall again over time, as the export structure of the economy moves up to skilled products where (skilled) males outweigh females.

Also, there is some anecdotal evidence of international connections between gender inequality and trade. Rodrik (2000) reported that Mauritius set out on a development strategy that depended on operating an export-processing zone. The segmentation of the labour force along gender lines, with female workers predominately employed in the export-processing zone, was crucial, as it ensured a large additional pool of low-wage workers with fewer rights for export production. Male workers, in contrast, have been able to preserve their status in the remaining sectors of the economy. In another example, Bhattacharya and Rahman (1999) observed that women in Bangladesh are likely to be pushed into low-skilled/low-wage jobs in the ready-made garments industry, which might explain Bangladesh's export success in this sector. Summing up, the evidence available in the literature has been rather limited and inconclusive. In particular, an extensive empirical analysis of the linkages between trade in those labour-intensive products, where women in developing countries are likely to work, and gender inequality seems to be missing.

Against this background, the paper deals with three issues: (1) how to measure gender inequality; (2) whether gender inequality is closely associated with the structure of trade flows, that is, comparative advantage in labour-intensive manufactured goods (cross-sectional analysis); and (3) whether that relationship holds over time in a panel data analysis. Accordingly, the paper is structured as follows: The next section shows how gender inequality can be defined and measured, whereas Section 3 briefly explains the (empirical) model and data used. The results of the empirical analysis of the linkage between gender inequality and comparative advantage in labour-intensive products are presented in Section 4. Finally, some policy implications and concluding remarks are found in Section 5.

2. Measuring Gender Inequality

There have been several attempts to measure female inequality across countries. In 1995, the UNDP (1995) introduced two indicators to quantify the degree of gender inequality: The Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM). The GDI is based on three variables, namely life expectancy at birth, educational attainment, which is measured by literacy rate and school enrolment, and access to resources in terms of GDP per capita converted at purchasing power parity exchange rates. These variables are also used to calculate the Human Development Index (HDI); however, the GDI adjusts the values for gender equality.[2] The GEM combines income shares, professional opportunities and participation in economic decision-making[3] and parliamentary participation as shares of parliamentary seats for both males and females.

Common for both indicators is that they combine absolute values for the considered indicators with a penalty for inequality.[4] Bardhan and Klasen (1999), Oudhof (2001) and Dijkstra (2002) criticise the composition of both UNDP indices. In particular, they all worry about an over-weighted income variable, as the GDI is strongly correlated with the absolute level of income. GDI and GEM, therefore, may underestimate gender inequality in richer countries. Dijkstra (2002) argues that these indicators do not just measure inequality, since they combine absolute achievement levels with a valuation of inequality. While various modifications have been suggested to overcome the shortages of the GDI and the GEM,[5] most of them cannot solve the problem with the income variable.

Against this background, we do not use these standard indicators as measures of gender inequality in the following analysis, but rather rely on disaggregated measures for gender

[2] More precisely, a penalty is introduced to express the weight which is given to equality, assuming that countries have an aversion to inequality given by an aversion factor ε (Oudhof, 2001).
[3] This is measured by the proportion of male and female administrative, professional, technical and managerial positions (Bardhan and Klasen, 1999).
[4] For detailed derivation and discussion of both the GDI and the GEM, see UNDP (1995), Bardhan and Klasen (1999), Oudhof (2001) and Dijkstra (2002).
[5] Alternatives are described in Oudhof (2001), Bardhan and Klasen (1999) and Dijkstra (2002). For example, one approach measures the GDI relative to the HDI, or the difference between the HDI and the GDI relative to the HDI.

imbalances in the labour market and education. More specifically, we measure gender inequality in three dimensions:

(1) Inequality in wage remuneration, computed as 1 minus the female divided by the male wage rate in manufacturing times 100 (the variable is called *Wage-inequality*)
(2) Access to the labour market, quantified by relative female/male labour market activity rates for individuals, ages 15-64 (*Lab-inequality*)
(3) Access to education, quantified by relative female/male literacy rates and relative female/male gross secondary school enrolment, both weighted 1/2 (*Edu-inequality*)[6]

The first indicator is usually known as the gender wage gap. Note that a higher figure for *Wage-inequality* implies increased gender inequality in remuneration, whereas larger numbers for *Lab-inequality* and *Edu-inequality* indicate less inequality. In contrast to the last two indicators, it is rather difficult to get comprehensive (gender) wage data for a large number of developing countries. To ensure that we obtain a relatively consistent data set, *Wage-inequality* has been calculated based on two International Labour Organisation (ILO) sources: the *Yearbook of Labour Statistics* (ILO, 2003b) and the *October Inquiry* (ILO, 2004b).[7] Both provide information on wages in manufacturing, frequently at a disaggregated level and differentiated by sex. If available, we have singled out female/male wage rates in labour-intensive manufacturing, as the following analysis focuses on labour-intensive commodities.

However, for a considerable number of developing and even developed countries, there are no meaningful wage data or consistent wage data over time at hand. In particular, wage data distinguished by sex is lacking. Whereas the total number of countries included in the empirical analysis is 92, we only have gender wage data differentiated by sex for 40 countries, namely 17 developed and 23 developing countries.[8] While this restricts the implications of the subsequent results, we do think that a sufficient number of countries

[6] Data sources for these and all other variables are reported in Appendix A.
[7] Oostendorp (2004) provides an extensive description of the ILO October Inquiry database.
[8] See Appendix B for the country sample. We have refrained from incorporating gender wage data from other sources, since we do not know whether they are compatible with the ILO data.

are included, as the analysis covers most important developing countries that have high trade figures in labour-intensive goods, such as China, Egypt, Malaysia, or Turkey.

In contrast to the gender wage gap and differences in access to education, inequality in labour market participation rates does not necessarily involve gender discrimination, as females may choose not to work or to work fewer hours if they take care of children or other family members. Discrimination in access to jobs, in job promotion or wages, on the other hand, may lead to a reduction in the female labour supply, thereby signalling discrimination too. As we cannot determine whether differences in labour market participation rates are voluntary or not, we prefer to use the term gender inequality rather than discrimination.

The official definition given by the ILO describes discrimination in employment and occupation as "[...] treating people differently and less favourably because of certain characteristics, such as their sex [...] irrespective of their merit or the requirements of the job" (ILO, 2003a, p. 15). So far, the ILO has set up two main conventions against discrimination:[9] First, the Equal Remuneration Convention (No. 100) aims to ensure equal pay not just for similar work but also for work of equal value. This idea takes into account the fact that women and men tend to work in different occupations and calls for objective measures to compare the relative value of one job with another. Second, the Discrimination (Employment and Occupation) Convention (No. 111) tries to ensure non-discriminatory treatment of all workers both in access to employment and during the employment contract. This implies equality in educational and occupational opportunity as well as participation in employment organisations and career advancement. Employment-related welfare systems and job security should be equally accessible for both male and female workers.[10]

[9] Of course, the ILO not only focuses on gender discrimination, but also on discrimination based on skin colour, religion, political beliefs or social origin.

[10] Both conventions are part of eight conventions which were put together in 1998 to form the Declaration on Fundamental Principles and Rights at Work: Freedom of Association and the Right of Collective Bargaining (C87 and C98), The elimination of all Forms of Forced and Compulsory labour (C29 and C105), The Elimination of

To see whether the ratification of both ILO conventions is related to our three indicators, we have computed a further variable, called *Convention*, representing the number of ratified core ILO conventions on discrimination (the indicator takes the value zero, one or two). Interestingly, ratifying the two ILO conventions seems to be a poor measure for the extent of gender inequality, as the correlations with *Wage-inequality*, *Lab-inequality* and *Edu-inequality* are rather low (Table 1). In 2000, the highest partial correlation is -0.26, implying that countries with a smaller gender wage gap are more likely to ratify the two conventions on gender discrimination.[11] Since the linkage between ratification and enforcement is rather low, we do not use *Convention* in our empirical analysis. Further, richer countries have on average less gender inequality in wage remuneration, labour-force participation rates and, in particular, access to education.

Table 1: Correlation Matrix, Gender Inequality Indicators, 2000

Variable	GNI	Wage-inequality	Lab-inequality	Edu-inequality	Convention
GNI	1.00				
Wage-inequality	-0.21	1.00			
Lab-inequality	0.26	-0.24	1.00		
Edu-inequality	0.51	-0.06	-0.16	1.00	
Convention	0.01	-0.26	-0.09	0.02	1.00

Note: *GNI* represents Gross National Income per capita, based on PPP (US $). *Convention* represents the number of ratified ILO conventions on female discrimination as of 31 Dec. 2000.

3. Trade Effects of Gender Inequality and Trade Indicators

After the introduction of the different measures of the extent of gender inequality, we focus next on the empirical model and the data used in the analysis. As an appropriate

Discrimination in Respect of Employment and Occupation (C100 and C111) and the Effective Abolition of Child Labour (C138 and C182), see ILO (1998).

[11] There are different reasons for this discrepancy. First of all, ratifying a particular convention does not automatically imply its thorough observance. For instance, Libya has ratified both conventions, but does not have a strong record on gender equality. Second, some countries do not ratify ILO conventions as sometimes the exact wording or the understanding of these conventions does not comply with national regulations or laws (OECD, 2000). It is partly for this reason that the United States has ratified none of the ILO conventions on discrimination, but has relatively low gender inequality in both the labour market and access to education.

theoretical framework to analyse the linkages of trade flows and gender inequality, we use a standard Heckscher-Ohlin trade model, assuming two countries, two goods (one labour- and one capital-intensive) and two production factors (capital and labour). If we have identical production technologies, constant returns to scale, identical and homogeneous consumer preferences across countries and no market distortions, then a country is likely to have a comparative advantage in the labour-intensive good if it is relatively labour abundant and capital scarce.

Within this modelling framework, an increase in the female labour-force participation rate, that is, a decline in gender inequality, enhances the labour endowment and expands or changes production possibilities with a bias towards labour-intensive goods.[12] As the production of these goods increases relative to the other goods, the country improves (or gains in) its comparative advantage. By modelling gender inequality in this way, we do not consider any effect on welfare levels, since these depend on a number of assumptions that are not the main focus of this paper. In particular, gender inequality itself is not incorporated in the utility function. Such an approach is far beyond our methodology, and therefore excluded from the analysis.

The impact of gender bias in educational attainment, conversely, may positively or negatively affect comparative advantage in labour-intensive goods. A positive link would be expected if firms take advantage of a well-educated and thus productive female labour force, by employing them in low-paid export-oriented sectors of the economy. On the other hand, if females are as well educated as males and are able to work in sectors and professions they want, a better-trained female workforce would lead to a reduction in the unskilled-labour endowment in the economy and, hence, would lead to a decline in comparative advantage in (unskilled-)labour-intensive goods.

[12] In another Heckscher-Ohlin modelling approach, we could distinguish between unskilled and skilled labour as the main factors of production. Yet the data for both types of labour are not available for a considerable number of developing countries, which would severely reduce our country sample. Also, modelling gender inequality as a change in the endowment of production factors is basically an application of the Rybczynski (1955) theorem.

Finally, the impact of gender inequality in wages is more difficult to incorporate into this modelling framework. In a Heckscher-Ohlin setting, relative factor prices across countries (wages and capital rents) are equalised through the equalisation of relative commodity prices (factor-price-equalisation theorem). This also applies to wages, as there are no differences in the remuneration of females or males within a country (assuming no productivity differences). Moreover, relative wages are the outcome of relative commodity prices, not the other way around. Any existing gender wage gap would be inefficient and costly to employers (Becker, 1971). Nevertheless, we do observe that male workers may enjoy higher wages, which cannot be explained through differences in labour productivity. Assuming persistent gender inequality in wages would then enable a firm to gain a competitive advantage vis-à-vis firms in other countries (and competitors in its own country). As a consequence, we would observe a stronger comparative advantage in labour-intensive goods.

In general, gender inequality is unlikely to affect significantly the overall export performance of a country, but rather the trade structure, that is, the composition of exports, may be changed.[13] Importantly, there is considerable evidence that females dominate certain export industries that are relatively labour intensive, such as textiles and clothing (Table 2). Usually, these are sectors that employ a larger number of labourers and provide relatively low wages (Seguino, 2000b). Yet it is unclear whether females in developing and emerging market economies are working in these sectors due to a lack of other job opportunities or by choice. Nevertheless, the employment patterns do indicate considerable job segregation.

[13] Though Seguino (1997, 2000a) found that a gender bias had an impact on the trade performance of Taiwan and South Korea, it is unclear whether her results can be generalised for all developing countries. Specific circumstances in these two countries may have contributed to their export success.

Table 2: Proportion of Females in Textiles and Clothing in Per Cent, Selected Countries, 1984 and 1990

	Textiles		Clothing	
Country	1984	1990	1984	1990
Columbia	34.3	n.a.	79.8	n.a.
Cyprus	66.5	72.3	83.2	86.5
Hong Kong	47.1	42.2	69.1	68.3
Malaysia	63.7	57.8	89.4	85.3
Philippines	46.6	48.4	80.0	79.6
Singapore	66.8	58.4	88.2	87.1
South Korea	65.7	57.3	76.7	72.0
Sri Lanka	57.5	50.8	89.1	89.4
Taiwan	64.7	64.7	80.2	80.2
Thailand	75.0	75.6	93.0	81.9

Source: Seguino (2000b); n.a.: not available.

Similar to textiles and clothing, other manufactured sectors that have a considerable share of females are footwear, sporting goods, toys, or electronics (UNCTAD, 2004). In certain countries, job opportunities for females may have been restricted to these specific export-oriented sectors of the economy. Therefore, we restrict our analysis to labour-intensive manufactures, since the impact of gender inequality will be felt most strongly in these sectors.

The relative labour intensity of manufactured goods is above all influenced by value added per worker.[14] Table 3 shows all commodities and the corresponding SITC numbers for labour-intensive commodities. Importantly, to check for the robustness of the results we use two different categories: core labour-intensive goods, which consist of textiles, apparel, glass products, footwear, or toys, and a broader range of these products, which comprises all goods included in the core category plus labour-intensive electronics, such as TVs, radios, telephone receivers, toasters, etc.

[14] The data on labour-intensive commodities has been taken from Tyers et al. (1987).

Table 3: Trade Indicators for Labour-intensive Goods, Core and Broad Definition

Commodity (SITC-No., Rev. 1)	Core labour-intensive goods (Trade-exp1 and Trade-rca1)	Broader range of labour-intensive goods (Trade-exp2 and Trade-rca2)
Textile yarn and fabric (65)	x	x
Glass, glassware and pottery (664-666)	x	x
Telecommunications apparatus (724)		x
Domestic electrical equipment (725)		x
Furniture and bedding (82)	x	x
Travel goods and handbags (83)	x	x
Apparel (84)	x	x
Footwear (85)	x	x
Baby carriages, games, toys, sporting goods (894)	x	x

Sources: Tyers et al. (1987) and own assembly.

We also differentiate between two different trade indicators to measure comparative advantage in these commodities: First, *Trade-exp1* and *Trade-exp2* are computed as the ratio of labour-intensive exports to total exports for the core and broader range of labour-intensive goods, respectively; and, second, *Trade-rca1* and *Trade-rca2* stand for revealed comparative advantage in these goods. *Trade-rca1*, for example, is calculated as follows:

$$(1) \qquad \text{Trade-rca1} = \frac{\dfrac{\text{exports of core labour-intensive products}}{\text{imports of core labour-intensive products}}}{\dfrac{\text{total exports}}{\text{total imports}}}$$

The computation of *Trade-rca2* is identical, except that the broader range of labour-intensive products is used. All in all, that gives us four dependent variables, which allows us to test the robustness of the empirical results.

As comparative advantage in a Heckscher-Ohlin framework is influenced by relative factor endowments, two control variables are used in the benchmark regression:

- *Capital*, which stands for the relative capital endowment, computed by average total investment in the previous ten years, that is, the annual average of the period 1991 to 2000 for the capital stock in 2000, divided by the land area

- *Labour*, measured as the total labour force in proportion to the land area, for the relative labour endowment

The first control variable is expected to be negatively associated with comparative advantage in labour-intensive goods, whereas the second is likely to be positively correlated with the four trade indicators. All countries reporting data for the dependent and independent variables have been included in the data set. The exception is Singapore, which has an extremely high labour density as a city-state.

The cross-sectional analysis is based on data for the year 2000. The specification of the basic trade model is as follows:

(2) $\text{Trade} = \alpha_0 + \alpha_1 \text{ Capital} + \alpha_2 \text{ Labour} + \alpha_3 \text{ Regional dummies} + \alpha_4 \text{ Control indicator for gender inequality} + \alpha_5 \text{ Indicator for gender inequality} + e$

where *Trade* stands for the four trade indicators, *e* is an error term and α_i are parameters. Apart from adding indicators for gender inequality, we also control for the equivalent aggregated indicators. If we focus on gender inequality in access to education, for instance, we also control for total educational attainment for both males and females. Moreover, a set of regional dummies in all cross-sectional regressions is included, to allow for regional characteristics.

4. Empirical Results

We start the presentation of the results of the linkage between trade flows and gender inequality with those for the gender wage gap. As can be seen from the results for the first four regressions, presented in columns 1 to 4 of Table 4, *Capital* and *Labour* have the expected negative and positive signs and are statistically significant at the 1 and 5 per cent level. The overall fit of the first two regressions is reasonable for such a heterogeneous set of countries, but considerably higher for *Trade-rca1* and *Trade-rca2*.

Whereas total wages in manufacturing (*Wage*)[15] as a further control variable has the expected negative sign, it does not seem to be closely associated with the trade indicators. Yet the gender wage gap always has a positive coefficient and a statistical significance at the 5 per cent level. The sign of the parameter implies that a higher degree of gender inequality in wages is positively associated with an improved comparative advantage in labour-intensive goods. But we have to keep in mind that the country sample is restricted to 29 countries, since only for these countries were total wage and gender wage data able to be obtained for the year 2000.[16]

Table 4: Gender Wage Inequality and Comparative Advantage, All Countries

	Cross-sectional analysis, 2000 Dependent variables				Panel analysis (fixed-effects), 1975-2000 Dependent variables			
Independent Variables	Trade-exp1 (1)	Trade-exp2 (2)	Trade-rca1 (3)	Trade-rca2 (4)	Trade-exp1 (5)	Trade-exp2 (6)	Trade-rca1 (7)	Trade-rca2 (8)
Constant	0.07	0.11	0.63	0.63				
	(1.23)	(1.60)	(1.03)	(1.29)				
Capital	-6.95***	-8.10***	-77.07***	-49.2***	-1.76	-3.46**	-33.50	-45.23*
	(-3.25)	(-4.02)	(-3.82)	(-3.29)	(-0.94)	(-2.05)	(-1.11)	(-1.97)
Labour	0.81***	0.71***	8.82***	3.81**	-0.42	-0.47	-51.31***	-28.64**
	(3.75)	(0.002)	(4.58)	(2.13)	(-0.47)	(-0.59)	(-2.62)	(-2.59)
Wage	-0.005	-0.004	-0.06	-0.03	-0.003**	-0.003**	-0.04	-0.008
	(-1.00)	(-0.84)	(-1.20)	(-1.06)	(-2.49)	(-2.10)	(-1.10)	(-0.37)
Wage-inequality	0.003**	0.004**	0.04**	0.03**	0.002*	0.002*	0.07**	0.05***
	(2.26)	(2.41)	(2.51)	(2.70)	(1.71)	(1.65)	(2.40)	(3.27)
Time					0.01**	0.02***	0.10	0.09
					(2.53)	(3.78)	(0.79)	(1.23)
Adj. R^2	0.30	0.18	0.59	0.47	0.80	0.81	0.72	0.80
F-value	2.5	1.8	6.1	4.2	16.6	17.3	10.9	16.2
N	29	29	29	29	161	161	161	161

Notes: See Appendix A for data sources; t-values, reported in parentheses, are based on White's (1980) correction for heteroskedasticity; multicollinearity has been tested by the creation of variance inflation factors (VIF); all regressions pass at conventional levels; to save space, the coefficients for the regional dummies are not shown; *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

Next, we examine the same linkage in a panel, employing data for 1975, 1980, 1985, 1990, 1995, and 2000. In general, panel (or pooled time-series) analysis can be performed either by using a common intercept for all countries, the country-fixed effect or the

[15] Wage data in local currency units have been converted into US dollars using exchange rates from the World Bank (2004) and, if provided on a weekly or monthly basis, have been converted into wages per hour.
[16] See Appendix B for the list of countries included in the regressions for the gender wage gap.

country-random model. While suitable F-tests suggested not using a common intercept for all countries, Hausman (1978) test statistics indicated that the fixed-effects model would be preferred.[17] The specification of the model is as follows:

$$(3) \quad \text{Trade} = \alpha_c + \alpha_1 \text{Capital}_{ct} + \alpha_2 \text{Labour}_{ct} + \alpha_3 \text{Control indicator for gender inequality}_{ct} + \alpha_4 \text{Indicator for gender inequality}_{ct} + \text{Time}_t + e_{ct}$$

where α_c is the country-specific fixed effect, $Time_t$ represents a time trend to incorporate factors over time that are likely to have an effect on the countries in the sample and e_{ct} (for country c and period t) is an error term.

In comparison to the cross-sectional analysis, we were able to include eleven further countries, as these countries report wage data for two or more contiguous periods in 1975 to 2000. Yet two countries, Botswana and Brazil, which were included in the cross-sectional analysis, had to be excluded in the panel analysis, as there are no observations over time available. In all, that expands the country sample to 38 countries. As can be seen in columns 5 to 8 of Table 4, the overall fit is reasonable, but the first two control variables do not always have the expected sign and/or are significant. These results might be due to the limited number of countries and contiguous periods for which wage data were available. *Wage* is still negative in all regressions and significant in the first two regressions (columns 5 and 6). Crucially, *Wage-inequality* is always positive and significant, implying that the positive linkage holds over time. This is an important result, as countries with higher wage inequality may exploit their comparative advantage in labour-intensive commodities in comparison to other countries with a similar factor endowment but less gender wage inequality.

Next, we explore the linkage between comparative advantage in labour-intensive goods and gender inequality in labour force participation rates (*Lab-inequality*). The results for the cross-sectional analysis, reported in columns 1 to 4 of Table 5, indicate that variations in the female/male labour force participation rates are statistically significant and

[17] This also applies to the following regressions for the other two gender inequality indicators.

positively associated with the two indicators for labour-intensive exports as a share of total exports, but not significant if we use the two measures for revealed comparative advantage. In addition, the overall fit of the regressions is higher in the first two trade regressions.

The results for the panel analysis, on the other hand, clearly show a positive and significant link between gender inequality in labour force participation rates and comparative advantage. Crucially, the panel analysis not only has the advantage of many more observations, but it also allows us to explore the linkages over time, that is, the dynamics of changes in both the dependent and the independent variables. The estimated positive sign for *Lab-inequality* is in line with the theoretically expected outcome, as a higher female labour force will enhance the labour endowment and, thus, comparative advantage in labour-intensive commodities. In other words: Less gender inequality in labour market participation rates is associated with a stronger comparative advantage, taking other country characteristics into account.[18]

[18] To check the robustness of the results, we also used several other measures of gender inequality, for instance, by taking female labour force participation rates (excluding male participation rates) or the share of females in the total labour force. Essentially, the results do not differ much with respect to sign and significance of the estimated coefficients. To save space, the results are not reported.

Table 5: Gender Inequality in Labour Force Participation Rates and Comparative Advantage, All Countries

	Cross-sectional analysis, 2000 Dependent variables:				Panel analysis (fixed-effects), 1975-2000 Dependent variables:			
Independent variables	Trade-exp1 (1)	Trade-exp2 (2)	Trade-rca1 (3)	Trade-rca2 (4)	Trade-exp1 (5)	Trade-exp2 (6)	Trade-rca1 (7)	Trade-rca2 (8)
Constant	0.35***	0.36***	0.92	1.08**				
	(3.27)	(3.37)	(1.13)	(2.02)				
Capital	-10.09***	-9.40***	-15.73	-13.49	-10.0***	-10.4***	-136.1***	-121.1***
	(-3.81)	(-3.76)	(-0.78)	(-0.85)	(-4.28)	(-5.09)	(-2.77)	(-4.39)
Labour	1.11***	1.06***	1.78	1.67	1.35**	1.39***	-6.87	-7.06
	(4.22)	(3.81)	(0.85)	(0.98)	(2.48)	(2.61)	(-0.58)	(-0.95)
Lab-inequality	0.33**	0.28**	0.04	0.19	0.16*	0.17*	4.61**	2.32*
	(2.49)	(2.06)	(0.04)	(0.28)	(1.81)	(1.83)	(2.10)	(1.72)
Time					0.02***	0.02***	0.25**	0.14***
					(3.90)	(4.69)	(2.55)	(2.60)
Adj. R^2	0.48	0.46	0.28	0.39	0.81	0.82	0.67	0.74
F-value	12.3	11.7	5.9	8.7	20.7	21.7	10.6	14.4
N	88	88	88	88	443	443	443	443

Note: Four countries that did not report trade data for the year 2000 had to be excluded from the cross-sectional, but not from the panel data analysis; see Table 4 for further notes.

The results might have been influenced by the inclusion of high-income countries, which usually have a relatively low share of labour-intensive exports in total exports (and no or very little comparative advantage in these goods). For that reason, sign and significance of the coefficients of the gender inequality indicators might be biased. To further examine the robustness of the results, high-income countries have been excluded in a second set of regressions. Only low- and middle-income countries, namely countries with a GNI per capita in 2000 of 9,206 US dollars or less according to a definition by the World Bank (2004), were incorporated in the regressions. Along these lines, the focus is on relatively poor countries, where gender inequality might be a problem of higher importance in comparison to higher-income countries. In total, 70 developing countries have been singled out, using the World Bank definition for our country sample.[19]

As can be seen from Table 6, the results in the cross-sectional analysis do hold up. The sign of the coefficients are identical, though the statistical significance is somewhat

[19] Again, due to data deficiencies, four developing countries had to be excluded from the cross-sectional analysis, but not from the pooled times-series analysis.

weaker in comparison to the regressions for the full country sample. On the other hand, the linkage does not hold over time, as *Lab-inequality* still is positive but not significant in the panel analysis. Overall, the extent of gender inequality is positively associated with comparative advantage in labour-intensive goods, though the relationship is stronger if all countries are included in the sample.

Table 6: Gender Inequality in Labour Force Participation Rates and Comparative Advantage, Developing Countries

	Cross-sectional analysis, 2000 Dependent variables:				Panel analysis (fixed-effects), 1975-2000 Dependent variables:			
Independent variables	Trade-exp1 (1)	Trade-exp2 (2)	Trade-rca1 (3)	Trade-rca2 (4)	Trade-exp1 (5)	Trade-exp2 (6)	Trade-rca1 (7)	Trade-rca2 (8)
Constant	0.34***	0.34***	2.19***	1.62***				
	(3.49)	(3.48)	(2.81)	(3.22)				
Capital	-21.44**	-16.57*	23.85	35.87	-41.7***	-40.1***	-841.3***	-493.1***
	(-2.30)	(-1.81)	(0.47)	(0.88)	(-6.51)	(-6.38)	(-3.84)	(-4.07)
Labour	1.19***	1.10***	0.66	0.80	2.37***	2.35***	13.54	1.92
	(4.31)	(4.08)	(0.34)	(0.54)	3.25	(3.20)	(0.67)	(0.16)
Lab-inequality	0.32*	0.30*	0.85	0.08	0.03	0.04	1.63	0.69
	(1.85)	(1.74)	(0.68)	(0.10)	(0.21)	(0.27)	(0.48)	(0.32)
Time					0.02***	0.02***	0.22*	0.14**
					(3.06)	(3.49)	(1.89)	(2.03)
Adj. R^2	0.49	0.50	0.29	0.43	0.81	0.81	0.67	0.75
F-value	11.2	11.9	5.4	9.0	19.1	19.5	9.7	13.5
N	66	66	66	66	311	311	311	311

See Table 4 for notes.

Finally, the relationship between female/male differences in access to education and trade in labour-intensive products is examined. We add *Education* to the regressions, representing total literacy rates and total gross secondary school enrolment, both weighted 50 per cent, to control for total educational attainment. The results for all countries in the cross-sectional analysis, reported in columns 1 to 4 of Table 7, do not indicate a statistically significant link between female/male educational attainment and comparative advantage in labour-intensive goods. If we look at changes over time (columns 5 to 8), on the other hand, we observe a very strong positive link, that is, less gender inequality in access to education is positively associated with comparative advantage. If we exclude

high-income countries, the picture is very similar, except that *Edu-inequality* is now significant at the 5 per cent instead of the 1 per cent level (Table 8).[20]

Table 7: Gender Inequality in Access to Education and Comparative Advantage, All Countries

	Cross-sectional analysis, 2000 Dependent variables:				Panel analysis (fixed-effects), 1975-2000 Dependent variables:			
Independent variables	Trade-exp1 (1)	Trade-exp2 (2)	Trade-rca1 (3)	Trade-rca2 (4)	Trade-exp1 (5)	Trade-exp2 (6)	Trade-rca1 (7)	Trade-rca2 (8)
Constant	0.22	0.21	0.78	0.59				
	(1.13)	(1.11)	(0.72)	(0.67)				
Capital	-8.72***	-8.44***	-22.11	-17.31	-7.95***	-8.40***	-109.7**	-106.0***
	(-3.21)	(-3.18)	(-1.37)	(-1.29)	(-3.48)	(-4.13)	(-2.49)	(-4.09)
Labour	1.00***	0.97***	1.85	1.67	1.31**	1.37***	-8.87	-8.42
	(3.16)	(-0.65)	(1.10)	(1.21)	(2.39)	(2.58)	(-0.73)	(-1.11)
Education	0.001	0.0001	0.02*	0.01*	0.001	0.002***	-0.04**	-0.02*
	(0.59)	(0.90)	(1.86)	(1.89)	(1.59)	(2.62)	(-2.22)	(-1.66)
Edu-inequality	-0.21	-0.19	-2.02	-1.13	0.29***	0.26***	6.52***	3.62***
	(-1.31)	(-1.21)	(-1.28)	(-1.05)	(3.45)	(3.19)	(2.77)	(2.83)
Time					-0.001	-0.0001	0.09	0.05
					(-0.28)	(-0.11)	(1.14)	(0.32)
Adj. R^2	0.41	0.42	0.31	0.41	0.82	0.83	0.68	0.75
F-value	8.7	8.9	5.8	8.4	22.1	23.0	10.9	15.1
N	88	88	88	88	443	443	443	443

See Table 4 for notes.

[20] Importantly, these results do not change much if the income threshold is set at a lower level, for instance, US $2,975 per capita, representing the income level for low- and lower-middle-income countries.

Table 8: Gender Inequality in Access to Education and Comparative Advantage, Developing Countries

	Cross-sectional analysis, 2000 Dependent variables:				Panel analysis (fixed-effects), 1975-2000 Dependent variables:			
Independent variables	Trade-exp1 (1)	Trade-exp2 (2)	Trade-rca1 (3)	Trade-rca2 (4)	Trade-exp1 (5)	Trade-exp2 (6)	Trade-rca1 (7)	Trade-rca2 (8)
Constant	0.13	0.11	1.37	0.86				
	(0.96)	(0.83)	(1.60)	(1.36)				
Capital	-33.17***	-30.04***	-60.78	-19.91	-40.3***	-38.7***	-769.9***	-450.4***
	(-4.06)	(-3.69)	(-1.39)	(-0.59)	(-5.84)	(-5.70)	(-3.61)	(-3.70)
Labour	1.40***	1.35***	1.83	1.41	2.50***	2.51***	10.04	-0.10
	(6.98)	(7.00)	(1.15)	(1.09)	(3.37)	(3.36)	(0.48)	(-0.01)
Education	0.004***	0.005***	0.03**	0.02**	0.003**	0.003***	-0.05*	-0.02
	(3.08)	(3.40)	(2.34)	(2.31)	(2.54)	(3.01)	(-1.67)	(-1.27)
Edu-inequality	-0.31	-0.30	-2.62	-1.58	0.18**	0.19**	6.11**	3.43**
	(-1.53)	(-1.45)	(-1.51)	(-1.39)	(2.08)	(2.17)	(2.37)	(2.41)
Time					-0.004	-0.004	-0.05	0.10
					(-0.71)	(-0.74)	(-1.67)	(1.21)
Adj. R^2	0.37	0.38	0.34	0.47	0.82	0.83	0.68	0.76
F-value	7.5	7.6	5.6	9.0	20.1	20.7	9.84	14.1
N	66	66	66	66	311	311	311	311

See Table 4 for notes.

Summing up the empirical evidence, our results show that there is a positive linkage between comparative advantage in labour-intensive goods and gender wage inequality and a negative link with respect to gender inequality in labour market participation rates and access to education. While the links between trade and gender inequality in labour-market participation rates and educational attainment are somewhat weaker, depending on whether all countries or just developing countries are included or whether a particular trade indicator for comparative advantage has been used, the clearest link (in terms of statistical significance) can be established regarding the gender wage gap, as firms may exploit wage discrimination to gain or enhance a comparative advantage in labour-intensive products.

Overall, these results are in line with those of Seguino (1997, 2000ab), who showed that wage differentials can boost total exports in export-oriented semi-industrialised countries. On the other hand, we carefully differentiate between total exports and the export structure. If a country has a very strong (and maybe increasing) comparative advantage in

labour-intensive goods, that does not automatically imply higher GNI growth rates, as the country might be locked to the production of these commodities and might not be able to switch to higher-valued goods over time. If that is the case, we do not expect a significant impact on growth rates. There might even be a negative influence if prices for labour-intensive products fall over time as competition increases.

Against this background, our results do not contradict the empirical evidence on the negative link between economic growth and gender inequality reported by Drèze and Sen (1989), Pritchett and Summers (1996), and Klasen (2002). What our results do indicate, however, is that developing countries with less gender wage inequality might be negatively affected, as their comparative advantage in labour-intensive commodities may erode if other countries with a similar factor endowment rely on females in their export sector. Also, the results imply that industrialised countries do not have a problem with gender inequality in developing countries; they may even "profit" from its occurrence due to possibly lower prices for labour-intensive goods.

5. Policy Implications and Concluding Remarks

As there is some cause for concern regarding the linkage between gender inequality and comparative advantage in labour-intensive goods, the question might arise as to whether sanctions – on an international level – should be imposed on commodities from countries with poor fundamental labour standards, such as high gender inequality in wage remuneration. Supporters of this position, who usually come from high-income OECD countries, argue for connecting trade and labour standards, if possible within the WTO framework, thereby punishing developing countries that do not observe basic standards and/or giving them an incentive to raise those standards, that is, to reduce gender inequality.

Though sanctions are popular, the effectiveness of trade sanctions as an instrument is highly questionable. In a large number of cases, countries do not change their behaviour

because sanctions have been imposed on them (Hufbauer and Elliot, 1999). What is more, this instrument focuses only on export industries and does not tackle gender bias in other areas. Trade sanctions may drive females to other sectors with potentially even lower labour standards. Regarding child labour, a closely related core labour standard, there is evidence that the effects of sanctions were unsatisfactory in some developing countries. In Bangladesh, for example, children were thrown out of their jobs in the garment industry as a result of boycott pressures by the United States, with most children ending up in far more dangerous employment, such as welding and prostitution (UNICEF, 1997).

Finally, the inclusion of labour standards in the WTO framework may even be exploited by high-income countries to protect their markets against allegedly "unfair" imports from poorer countries with lower standards.[21] That is exactly what developing countries fear, as high-income countries like those of the European Union are still calling for discussion of links between trade and fundamental workers' rights like gender discrimination. The European Union brought the issue forward at the WTO conference in Doha in November 2001, but that attempt was rejected by several developing countries. Consequently, all parties agreed that the issue of core labour standards remain in the sphere of influence of the ILO. Since trade unions, human right activists and some governments of high-income countries show an ongoing interest in the matter, it is highly likely that the issue of gender inequality will reappear on the international trade policy agenda. Moreover, taking our results into account, in particular the linkage between comparative advantage and the gender wage gap, the need to tackle the issue on the international agenda becomes understandable.

However, if sanctions within the WTO framework are not appropriate as an effective policy instrument, it remains open as to how to deal with gender inequality and consequences such as the gender wage gap. From our point of view, two things are important. First, it is rather obvious that relatively poor developing countries should be able to enhance their GNI growth rates, as gender inequality is – on average – negatively

[21] See Bhagwati (1996) for a discussion on the political economy of labour standards and international trade.

associated with income levels.[22] Imposing trade restrictions that also reduce trade and foreign (and domestic) investment would be thus counterproductive, as important determinants of economic growth are negatively affected. More importantly, improving the monitoring and surveillance by the ILO would serve as an encouragement, as there is evidence that most governments respond to complaints presented under the formal procedures of the ILO (OECD, 2000; ILO, 2003a). In addition, the ILO could provide technical assistance to very poor developing countries which may lack the required skills. On the other hand, if monitoring and surveillance do not work effectively, one may have to reconsider the issue of strengthening ILO enforcement powers.

[22] For cultural and historical reasons, some high-income Arab countries clearly do not fit into this picture. See Busse (2004) for an analysis of the determinants of gender inequality.

References

Bardhan, Kalpana and Stephan Klasen (1999), UNDP's Gender-related Indices: A Critical Review, *World Development*, Vol. 27, No. 6, pp. 985-1010.

Becker, Gary (1971), *The Economics of Discrimination*, 2nd Edition, Chicago: University of Chicago Press.

Berik, Günseli, Yana van der Meulen Rodgers and Joseph Zveglich (2004), International Trade and Gender Wage Discrimination: Evidence from East Asia, *Review of Development Economics*, Vol. 8, No. 2, pp. 237-254.

Bhagwati, Jagdish (1996), The Demands to Reduce Domestic Diversity Among Trading Nations, in Jagdish Bhagwati and Robert Hudec (eds.), *Fair Trade and Harmonization, Cambridge*, MA: MIT Press, pp. 9-40.

Bhattacharya, Debapriya and Mustafizur Rahman (1999), *Female Employment Under Export-propelled Industrialization: Prospects for Internalizing Global Opportunities in the Apparel Sector in Bangladesh*, United Nations Research Institute for Social Development.

Black, Sandra and Elizabeth Brainerd (2004), Importing Equality? The Impact of Globalization on Gender Discrimination, *Industrial and Labor Relations Review*, Vol. 57, No. 4, pp. 540-559.

Busse, Matthias (2002), Do Labor Standards Affect Comparative Advantage in Developing Countries? *World Development*, Vol. 30, No. 11, pp. 1921-1932.

Busse, Matthias (2004), On the Determinants of Core Labour Standards: The Case of Developing Countries, *Economics Letters*, Vol. 83, No. 2, pp. 211-217.

Cagatay, Nilüfer and Korkuk Ertürk (2004), *Gender and Globalization: A Macroeconomic Perspective*, Working Paper 19, ILO Policy Integration Department, World Commission on the Social Dimension of Globalization, Geneva: ILO.

Dijkstra, Geske (2002), Revisiting UNDP's GDI and GEM: Towards an Alternative, *Social Indicators Research*, Vol. 57, No. 3, pp. 301-338.

Drèze, Jean and Amartya Sen (1989), *Hunger and Public Action*, New York and Oxford, Oxford University Press.

Hausman, Jerry (1978), Specification Tests in Econometrics, *Econometrica*, Vol. 46, No. 6, pp. 1251-1271.

Hufbauer, Gary and Kimberly Elliot (1999), Same Song, Same Refrain? Economic Sanctions in the 1990's, *American Economic Review*, Vol. 89, No. 2, pp. 403-408.

ILO (1998), *ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up*, Geneva: ILO.

ILO (2003a), *Time for Equality at Work*, International Labour Conference 91st Session 2003, Report I (B), Geneva: ILO.

ILO (2003b), *Yearbook of Labour Statistics 2003* (and older issues), Geneva: ILO.

ILO (2004a), Ratifications of the ILO Fundamental Conventions, Internet Posting: http://webfusion.ilo.org/public/db/standards/normes/appl/appl-ratif8conv.cfm?Lang=EN.

ILO (2004b), ILO October Inquiry, Internet Posting; http://laborsta.ilo.org.

ITC (2004), COMTRADE Trade Database of the ITC (International Trade Center) and United Nations Statistics Division, Online Access, Internet Posting: http://unstats.un.org/unsd/comtrade/.

Joekes, Susan (1995), *Trade-related Employment for Women in Industry and Services in Developing Countries*, Occasional Paper 5, Geneva: UNRISD.

Klasen, Stephan (1994), Missing Women Reconsidered, *World Development*, Vol. 22, No. 7, pp. 1061-1071.

Klasen, Stephan (2002), Low Schooling for Girls, Slower Growth for All? Cross-country Evidence on the Effect of Gender Inequality in Education on Economic Development, *World Bank Economic Review*, Vol. 16, No. 3, pp. 345-373.

Kucera, David and William Milber (2000), Gender Segregation and Gender Bias in Manufacturing Trade Expansion: Revisiting the „Wood Asymmetry", *World Development*, Vol. 28, No. 7, pp. 1191-1210.

Murthi, Mamta, Anne-Catherine Guio and Jean Drèze (1995), Mortality, Fertility, and Gender Bias in India: A District-Level Analysis, *Population and Development Review*, Vol. 21, pp. 745-782.

OECD (2000), *International Trade and Core Labour Standards*, Paris: OECD.

Oostendorp, Remco (2004), *Globalization and the Gender Wage Gap*, World Bank Policy Research Working Paper 3256.

Osterreich, Shaianne (2002), *North-South Gender Gaps in Wages and the Prebisch-Singer Thesis: An Empirical Investigation*, Ithaca College, mimeo.

Oudhof, Ko (2001), The GDI as a Measurement Instrument on Gender Aspects of Development in the ECE-Region, *Statistical Journal of the United Nations Economic Commission for Europe*, Vol. 18, No. 1, pp. 1-25.

Pritchett, Lant Hayward and Lawrence Summers (1996), Wealthier is Healthier, *Journal of Human Resources*, Vol. 31, No. 4, pp. 841-868.

Rodrik, Dani (2000), Institutions for High-quality Growth: What They Are and How to Acquire Them, *Studies in Comparative International Development*, Vol. 35, No. 3, pp. 3-31.

Rybczynski, Tadeusz (1955), Factor Endowment and Relative Commodity Prices, *Economica*, Vol. 22, pp. 36-41.

Seguino, Stephanie (1997), Gender Wage Inequality and Export-led Growth in South Korea, *Journal of Development Studies*, Vol. 34, No. 2, pp. 102-137.

Seguino, Stephanie (2000a), The Effects of Structural Change and Economic Liberalisation on Gender Wage Differentials in South Korea and Taiwan, *Cambridge Journal of Economics*, Vol. 24, No. 4, pp. 437-459.

Seguino, Stephanie (2000b), Gender Inequality and Economic Growth: A Cross-country Analysis, *World Development*, Vol. 28, No. 7, pp. 1211-1230.

Sen, Amartya (1989), Women's Survival and as a Development Problem, *Bulletin of the American Academy of Arts and Science*, Vol. 43, No. 2, pp. 14-29.

Standing, Guy (1989), Global Feminization Through Flexible Labor, *World Development*, Vol. 17, No. 7, pp. 1077-1095.

Standing, Guy (1999), Global Feminization Through Flexible Labor: A Theme Revisited, *World Development*, Vol. 27, No. 3, pp. 583-602.

Summers, Lawrence (1994), *Investing in All the People: Educating Women in Developing Countries*, Washington, DC: World Bank.

Tyers, Rodney, Prue Phillips and Christopher Findlay (1987), ASEAN and China Exports of Labor-intensive Manufactures: Performance and Prospects, *ASEAN Economic Bulletin*, Vol. 3, No. 3, pp. 339-367.

UNCTAD (2004), *Trade and Gender: Opportunities for Developing Countries*, Geneva: United Nations.

UNDP (1995), *Human Development Report*, New York and Oxford: Oxford University Press.

UNICEF (1997), *The State of the World's Children 1997*, Oxford: Oxford University Press.

White, Halbert (1980), A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, *Econometrica*, Vol. 48, No. 4, pp. 817-838.

Wood, Adrian (1991), North-South Trade and Female Labour in Manufacturing: An Asymmetry, *Journal of Development Studies*, Vol. 27, No. 2, pp. 168-189.

World Bank (2004), World Development Indicators 2004, Data on CD-ROM.

Appendix A: Definition of Variables and Data Sources

Variable	Definition	Source
GNI	Gross national income per capita in current US dollars ('000), based on purchasing power parity (PPP) exchange rates	World Bank (2004)
Trade-exp1	Exports of labour-intensive manufactured goods divided by total exports of goods, core products	ITC (2004)
Trade-exp2	Exports of unskilled-labour-intensive manufactured goods divided by total exports of goods, broader range of products	ITC (2004)
Trade-rca1	Revealed comparative advantage in labour-intensive manufactured goods, core products	ITC (2004)
Trade-rca2	Revealed comparative advantage in labour-intensive manufactured goods, broader range of products	ITC (2004)
Capital	Total capital stock, annual average of ten years before the considered period, i.e., average investment in the period 1991-2000 for Capital2000, divided by land area (1,000,000 sq. km of land)	World Bank (2004)
Labour	Total labour force divided by land area (1,000,000 sq. km of land)	World Bank (2004)
Convention	Number of ratifications of the two fundamental ILO conventions on female discrimination No. 100 and No. 111, 31 December 2000	ILO (2004a)
Education	Total educational attainment rate, based on gross secondary school enrolment rate (in %) and adult literacy rate (in %), both weighted 50 per cent	World Bank (2004)
Wage	Wage rate in (labour-intensive) manufacturing in current US dollars	ILO (2004), World Bank (2004)
Wage-inequality	Gender wage gap in (labour-intensive) manufacturing, (1 minus (female divided by male wage rate)) times 100	ILO (2003b, 2004b)
Lab-inequality	Female divided by male labour force activity rate, ages 15-64	World Bank (2004)
Edu-inequality	Female divided by male educational attainment rate, that is, the average of the gross secondary school enrolment rate (in %) and the adult literacy rate (in %), both weighted 50 per cent	World Bank (2004)
Regional dummies	Set of five regional dummy variables: (1) Sub-Saharan Africa, (2) Asia & the Pacific, (3) Middle East & North Africa, (4) Latin America & the Caribbean, (5) High-income countries	World Bank (2004)

Appendix B: Country Sample

Algeria, Argentina, ***Australia***, ***Austria***, Bangladesh, Barbados, Benin, **Bolivia**, **Botswana**, **Brazil**, Burkina Faso, Burundi, Cameroon, ***Canada***, Central African Republic, Chile, **China**, Colombia, **Costa Rica**, Cote d'Ivoire, ***Cyprus***, ***Denmark***, Dominican Republic, Ecuador, **Egypt**, El Salvador, Ethiopia, Fiji, ***Finland***, ***France***, **Gambia**, Ghana, ***Greece***, Guatemala, Guyana, Honduras, *Iceland*, India, Indonesia, **Iran**, ***Ireland***, *Israel*, *Italy*, Jamaica, ***Japan***, **Jordan**, **Kenya**, **Republic of Korea**, Lesotho, Madagascar, Malawi, **Malaysia**, Mali, **Mauritius**, **Mexico**, Morocco, Nepal, ***Netherlands***, ***New Zealand***, Nicaragua, Niger, Nigeria, ***Norway***, Pakistan, **Panama**, Papua New Guinea, **Paraguay**, **Peru**, **Philippines**, ***Portugal***, Rwanda, Senegal, South Africa, *Spain*, **Sri Lanka**, Sudan, Swaziland, ***Sweden***, ***Switzerland***, Syrian Arab Republic, **Tanzania**, **Thailand**, Togo, Trinidad and Tobago, Tunisia, **Turkey**, ***United Kingdom***, ***United States***, Uruguay, Venezuela, Zambia, Zimbabwe.

Notes: The countries in italics are high-income countries (World Bank (2004) definition) that have been excluded from the regressions that focus on developing countries, and those in bold are included in the *Wage-inequality* regressions (cross-sectional and/or panel analysis).