Does openness reduce wage inequality in developing countries? A Panel data Analysis

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Revised January 2008

Abstract

This paper provides panel data evidence on trade liberalization and wage inequality in Bangladesh. Using several standard econometric models, wage equations for skilled and unskilled workers in the formal manufacturing sector are estimated for the 1975-2002 period. The results, particularly the estimates from a dynamic fixed effects model, provide some weak evidence that openness contributes to a reduction in wage inequality between skilled and unskilled workers. The results also indicate that real wages of both unskilled and skilled workers increased during the period.

Key words: Bangladesh; openness; wage inequality; panel data, panel unit root; dynamic model

JEL codes: F14, F15, O15, C33

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1. Introduction

The issues of wage inequality and openness to international trade have received considerable attention in recent years. Many developing countries have undergone significant liberalization of international trade since the 1980s. A widening wage gap between skilled[1] and unskilled workers has also been observed in many of these countries (most notably in Latin American countries). A large number of studies have indicated that the greater openness has contributed to this increase (see Williamson, 1997; Arbache et al., 2004; Goldberg and Pavcnik, 2004). These findings have created an intense debate among academics and policy makers, as trade theory predicts that greater openness is instead expected to reduce wage inequality in developing countries.

The standard model used to investigate the effects of trade openness on wage inequality is the Hecksher-Ohlin-Samuelson (H-O-S) model (Samuelson, 1953), which under certain assumptions predicts a reduction in wage inequality in developing countries via the "Stolper-Samuelson effect" (Stolper and Samuelson, 1941). This effect suggests that for a given technology, trade and wages are linked through the changes in relative prices of skilled and unskilled labor-intensive products. Hence, openness to trade leads to a reduction in wage inequality in unskilled labor-intensive developing countries by raising the relative price of unskilled labor-intensive products with a consequent increase in unskilled-labor wages.

Empirical studies regarding the Stolper-Samuelson effect in the context of developing countries, however, exhibit mixed results. While the East Asian experience in

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[1] The definition of skilled labor includes all professional and technical workers, managers, and craftsmen with advanced education, substantial training, or work experience (Wood, 1994).

the 1960s and 1970s is in line with this prediction (Wood, 1997), studies on Latin American countries, on the contrary, show that openness contributes to an increase in wage inequality (Beyer et al., 1999, in Chile; Galiani and Sanguinetti, 2003, in Argentina; Attanasio et al., 2004, in Colombia). Most recent evidence for India (Mishra and Kumar, 2005) and Kenya (Bigsten and Durevall, 2006), however, suggests that openness contributes to a reduction in wage inequality.

The divergent findings might be due to several reasons. Firstly, methodology and the studied time period differ among studies. Secondly, the initial levels of inequality and factor abundance, both important factors affecting wage inequality, vary among countries. For example, compared to the natural resource abundance in many Latin American countries, most Asian countries have a relative abundance of unskilled labor. Therefore, the impact of increased trade on wage inequality may differ between countries in Latin America and Asia. Finally, some of the assumptions on which the H-O-S model is based are often too restrictive for developing countries. For example, due to lack of labor reallocation across sectors, trade openness may affect wage inequality through changes in wages. However, if wages are not as flexible as the H-O-S model requires, then changes in labor demand may increase transitional unemployment or increase the size of the informal sector. There is both theoretical (Goldberg and Pavcnik, 2003) and empirical (Attanasio et al., 2004) evidence that greater openness often causes the informal sector, which constitutes a greater share of the labor force in many developing countries, to grow. Since workers are paid less in the informal sector, an increase in the size of this sector may keep real wages down and thus raise the overall wage gap between skilled and unskilled workers.

This paper adds to the literature on openness and wage inequality[2] by presenting an empirical analysis using panel data from the Bangladesh manufacturing sector. Bangladesh has a relative abundance of unskilled workers and has been pursuing trade liberalization since the 1980s. Hence it provides an interesting opportunity to analyze the issue of openness and wage inequality. A few studies on Bangladesh do exist. For example, based on a single industry time series analysis, Durevall and Munshi (2008) find that openness increases real wage for both skilled and unskilled workers while it does not affect skilled and unskilled wages differently.[3] The objective of this paper is to further investigate this issue by using panel data – an approach that produces more precise estimates and to a greater extent takes care of omitted variable biases. In this paper, four standard panel data models are estimated. The results provide some weak evidence that openness to trade reduces wage inequality in Bangladesh. The results also indicate that openness contributes to an increase in both skilled and unskilled wages. These results are robust to both the inclusion of a proxy of human capital and industry-specific prices as additional control variables.

The remainder of the paper is organized as follows. Section 2 provides an overview of Bangladesh trade policy and labor market issues. Section 3 describes the econometric modeling and the data used in the paper. Section 4 presents the empirical analyses and results, and Section 5 concludes the paper.

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[2] As in many other studies, wage inequality here refers to the wage gap between skilled and unskilled workers.

[3] Using a general equilibrium approach, Mujeri and Khondker (2002) find increasing wage inequality in Bangladesh; however, they suggest that skill-biased technical change and changes in factor endowments were more important than trade in explaining the wage inequality in their study.

2. Overview of Bangladesh Trade Policy and Labor Market Issues

This section first provides an overview of the trade policy issues in Bangladesh since independence. Then it briefly discusses the issues related to the labor market.

From its first year of independence in 1971, Bangladesh followed an import substitution industrialization strategy for a decade. Trade policies were based on high tariffs and quantitative restrictions on imports, resulting in an anti-export bias. The trade liberalization process started in the mid-1980s, with the primary objective to create a neutral trade regime by reducing and ultimately eliminating the anti-export bias. Liberalization of the import regime was accomplished primarily through the removal of import bans and quantitative restrictions. To increase the competitiveness of domestic industries, customs duty was greatly reduced for raw materials and capital goods used as inputs for manufacturing exports, while it was kept high on final goods. Overall, the customs duty rate was reduced from 350% in 1991 to 37.5% in 2000 (Trade Policy Review, 2000). To increase transparency, the Harmonized System was introduced in July 1988, and the multiple-rate sales tax was replaced by a 15% value-added tax in 1992 (Trade Policy Review, 1992). Following this, the number of four digit codes subject to quantitative restrictions was reduced from 550 (26%) in 1987 to 124 (10%) in 2000.

Export promotion was also one of the main objectives of Bangladesh trade policy reform. Several measures were undertaken in order to encourage exports, including new incentives and facilities for the exporters, duty and tax free imports of inputs for exporters, creation of the Export Processing Zones, and most importantly, improvement of export policy administration. These reforms helped expand the export base mainly by increasing non-traditional exports; the remarkable success of the ready-made garments industry is an

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example (Bhattacharya et al., 2002). To increase international competitiveness, a series of other reform measures were undertaken: financial sector reform, privatization, removal of restrictions on foreign direct investment, and exchange rate liberalization, just to name a few.

Like in most developing countries, Bangladesh trade reform was mostly concentrated in the manufacturing sector, which by contributing around 70 percent of export revenue is the most important foreign-exchange earner. Jute, Cotton textile, Match, Engineering, and Mustard oil are the five major industries in the manufacturing sector, and are included in this study. These industries are mostly unskilled labor-intensive, tradable, and dependent on imported raw materials. At the time of independence, they were all in the public sector, but then underwent wide-scale reform including tariff reductions and privatization. Competition has increased in the industries, and the effective rates of protection have been reduced significantly. For example, the rates for Jute declined from 64.40% in 1993 to 26.80% in 2000 (Trade Policy Review, 2000). The rationalization of the tariff structure allowed the industries to import raw materials and capital machineries at low duty rates.

The Bangladesh labor market comprises formal and informal markets. The formal sector workers constitute less than 20% of the total labor force and are mainly employed in the manufacturing sector. Wage setting is regulated by the government and has not changed much since independence. Wages in the public sector are determined and raised periodically by the ad-hoc National Pay Commission. Wages in the formal private sector are determined by collective bargaining, using government-determined wages as a reference point. In sectors where trade unions do not exist or collective bargaining fail due

to weak trade unions, minimum wages are determined based on the recommendation of the Minimum Wage Board. However, lack of organizational structure and legislative provisions are important reasons why many private sector employees are still earning less than minimum wage (Nordås, 2004). There have nevertheless been many interventions in the labor market; market forces are likely to have played an important role in determining the wages during the period of study.

3. Econometric Model and Data

This section first outlines the empirical model, and then describes the data and explains the choice of the explanatory variables used in the analysis. Finally it reports the results of the non-stationarity testing of the variables using a panel unit root test and the Augmented Dickey-Fuller (ADF) test.

To test for the impact of greater openness on the relative wages of skilled and unskilled workers, wage equations for skilled and unskilled workers are estimated separately. The choice of variables is based on economic theory and data availability. The generalized version of the model is as follows, where all the variables are measured in logarithms:

$$ws_{it} = \alpha_0 + \alpha_1 ws_{i,t-1} + \alpha_2 open_t + \alpha_3 rprice_{it} + \alpha_4 humcap_t + D_t + u_{it} \qquad (1)$$

$$wus_{it} = \beta_0 + \beta_1 wus_{i,t-1} + \beta_2 open_t + \beta_3 rprice_{it} + \beta_4 humcap_t + D_t + \eta_{it} \qquad (2)$$

In the above equations, ws_{it} represents the wages of skilled workers, wus_{it} the wages of unskilled workers, where i indexes individual industry in a cross section and t indexes time. The variables $ws_{i,t-1}$ and $wus_{i,t-1}$ denote the one period lag of the skilled

and unskilled wages, respectively. In both equations, $open_t$ and $rprice_{it}$ denote the level of openness and the relative price, respectively, and $humcap_t$ denotes a measure of human capital. The variable D_t denotes a time trend, whereas u_{it} and η_{it} are two disturbance terms for both equations. As usual, α_0 and β_0 are intercept terms. To test whether greater openness contributes to a reduction in wage inequality, we test whether openness increases real wages for unskilled workers relative to wages for skilled workers. If it does, one would expect that $\beta_2 - \alpha_2 > 0$. The coefficients of interest are therefore in the short run α_2 and β_2 and in the long run $\alpha_2 / (1 - \alpha_1)$ and $\beta_2 / (1 - \beta_1)$.

3.1 Data and Variable Description

The data used in this paper is a balanced panel created on real wages of skilled and unskilled workers[4] of all organized plants[5] in five manufacturing industries (Jute, Cotton textile, Match, Engineering, and Mustard oil) with 28 time series observations covering the 1975-2002 period. Real wages are measured in constant 1996 prices using the GDP deflator. As the choice of variables is often restricted due to a lack of available data, we have openness, industry-specific relative prices, and human capital as explanatory variables in our analysis. Although it would have been desirable to also include measures of productivity and capital labor ratio as explanatory variables, the lack of data availability

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[4] Following Wood (1994) and the definition used by Bangladesh Bureau of Statistics, skilled workers are in this paper those who possess both professional training and skills to operate a machine, received either on-the-job or from any formal or informal training institute, and basic knowledge of repair, maintenance, and cleaning of the machine. An unskilled worker, on the other hand, does not have such professional training or skills and works as a helper to skilled workers.

[5] Organized plants are those that employ ten or more workers from the formal sector. Plant-level data, however, was not available.

restricts our ambition to do so. In the absence of long time series data on tariffs and quantitative restrictions, we use a price-based measure of openness, hereafter *open*, to examine the changes in the degree of protection. This measure is defined as the ratio of the US manufacturing price index (converted to Bangladesh currency using the official exchange rate) to the Bangladesh manufacturing price index. Import substitution policy kept manufacturing prices high in Bangladesh for more than a decade, so reduced protection is expected to result in an increase in the ratio. It would have been more appropriate to compare domestic manufacturing prices with world market prices, but in the absence of such data we use the US manufacturing price index since the US is the major trading partner of Bangladesh. A similar measure is used by Athukorala and Rajapatirana (2000) for Sri Lanka, Bigsten and Durevall (2006) for Kenya, and Durevall and Munshi (2008) for Bangladesh.[6]

According to the H-O-S assumption of perfect factor mobility, opening up leads to changes in wage inequality via changes in relative prices,[7] regardless of industries being import-competing or export-competing. However, as the specific factor model suggests, the implication is different for import-competing and export-competing industries, at least in the short run when factors are not mobile. With reduced protection, prices should fall in import-competing industries and rise in export-competing industries. Since the industries in our study are mainly import-competing and likely to have a comparative advantage in

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[6] In addition to this price-based measure of openness, Durevall and Munshi (2008) use three other measures of openness: the ratio of export plus import to GDP, the ratio of aggregate export to GDP, and the ratio of imports of consumer goods to aggregate consumption. However, no statistically significant differences among their impacts on skilled and unskilled wages are found.
[7] Beyer et al. (1999) find similar evidence for this in Chile. However, Hanson and Harrison (1999) find only weak correlation between price changes and changes in trade policy for Mexico.

unskilled labor-intensive goods, reduced protection is expected to have a negative impact on prices. The industry-specific relative prices are measured as the price of output produced by each industry divided by the GDP deflator.

Generally, increases in human capital are expected to lead to higher real wages. Depending on the level of education and/or experience, human capital can have different impacts on the relative demand for skilled/unskilled workers. For example, the returns to post-secondary education play an important role compared to primary and secondary education in explaining wage inequality in some studies (see Beyer et al., 1999, for Chile; Attanasio et al., 2004, for Colombia). On the other hand, greater openness increased the demand for unskilled workers with basic general education compared to those with specialized skills in Korea and Taiwan in the 1960s and in Singapore in the 1970s, resulting in reduced wage inequality (Wood, 1997). However, in our dataset, the main distinction between skilled and unskilled workers is the years of on-the-job experience. While the requirement to be an unskilled worker (apprentice, helper) is basic general education, an unskilled worker could be promoted to a skilled worker (junior operator, operator, and senior operator) according to his years of experience. Given that a good proxy for measuring the stock of human capital is not available, we use the secondary school enrolment ratio. This proxy, however, does not capture the years of on-the-job experience, and can therefore only be regarded as a partial measure of human capital. In any case, the inclusion of this variable (human capital) serves as a robustness check of the present analysis of the impact of openness on the wage gap between skilled and unskilled workers.

Table 1 reports the descriptive statistics of the variables used in the analysis. The variables are plotted in Figures 1-4.

>>> Table 1 here

Figure 1 depicts the real wage of skilled and unskilled workers in the five industries. Both series exhibit low growth in all five until the beginning of the liberalization process in the mid-1980s when growth started to increase. As evident in Figure 2, the openness variable too shows little growth until the mid-1980s and an increasing trend thereafter, especially in the late 1990s. The relative prices are displayed in Figure 3; all sectors except Mustard oil show high variability throughout the period. The human capital proxy, depicted in Figure 4, shows an increasing trend starting in 1977.

>>> Figure 1 here

>>> Figure 2 here

>>> Figure 3 here

>>> Figure 4 here

3.2 Unit root test

Given that most of the variables described above exhibit trends, we formally test for the presence of unit roots before proceeding with the econometric analysis. The panel unit root test[8] designed by Levin, Lin, and Chu (2002), the Levin-Lin test, is used to test for stationarity of the three panel data series, i.e., log of skilled wage, log of unskilled wage, and log of relative price. For the two variables that lack cross-section observations, i.e., log of openness and log of human capital proxy, the ADF test is used instead. The Levin–Lin test is designed for balanced panels and works very well even in panels with relatively small dimensions, and hence it is appropriate in our case. Furthermore, it allows for individual effects, time effects, and a time trend, and evaluates the null hypothesis that each time series has unit root against the alternative hypothesis that each time series is stationary. To allow for serial correlation, lags of the dependent variable are introduced and hence the model may be viewed as an ADF test. The test statistics for the Levin-Lin panel unit root test are reported in Table 2.

>>> **Table 2 here**

Out of the three panel variables, the test statistics are significant for two (log of unskilled wages and log of relative price) at the 1% level, rejecting the null hypothesis of unit root. Log of skilled wages is significant at the 5% level. It is therefore evident that all

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[8] The conventional unit root tests such as the Augmented Dickey-Fuller test or Phillips-Peron tests have low power, especially if the sample size is small (Maddala and Kim 1998). Panel data unit root test, on the other hand, is able to increase the power of unit root tests by combining time series with cross-section observations. See for example Breitung and Pesaran (2005) for a review of several methods to test panel unit root.

three variables are stationary around a trend. For log of openness and log of human capital, we apply the ADF test with an intercept and a deterministic trend – see Table 3 for results.

>>> Table 3 here

The test statistics indicate that the log of openness series is significant at the 5% level, whereas log of human capital is not significant. However, since the estimated root for the latter is only 0.60, we proceed under the assumption that there is no unit root in any of the series.

4. Empirical Analysis

There are several econometric models for analyzing panel data and, depending on the assumptions about unobserved effects, all have relative advantages and disadvantages. In this paper, four standard models are used to estimate the wage equations: the ordinary least square method (OLS), the fixed effects method (FE), the dynamic FE method and the two-stage least square method (2SLS).

We first estimate a simple non-dynamic specification of equations (1) and (2) with OLS and FE, where log of skilled wages and log of unskilled wages are regressed on only the key explanatory variable openness and on a time trend. We then estimate a simple dynamic specification of both equations with the dynamic FE and 2SLS methods, where a one period lag of the dependent variable is added as an explanatory variable, together with openness and a time trend. The results are reported in Table 4. Finally we estimate the non-dynamic and the dynamic specifications of both equations by adding two other explanatory variables: log of relative price and log of human capital. The results are reported in Table 5.

Tables 4 and 5 present the pooled OLS, as a baseline model, in Column 2 and Column 6 for skilled and unskilled workers respectively. The coefficients for most of the variables are insignificant, probably due to omitted industry fixed effects. The FE estimator takes care of this problem by eliminating the unobserved heterogeneity across industries provided that the omitted variables are time-invariant.

Tables 4 and 5 report the non-dynamic FE estimates in Column 3 and Column 7 for skilled and unskilled workers respectively. Here openness does not have a significant effect on skilled and unskilled wages in the base specifications (i.e. without additional control variables) (see Table 4). However, when adding relative price and human capital in the model (Table 5), the coefficient for openness in the unskilled wage equation becomes positive and statistically significant (Table 5, Column 7).

>>> **Table 4 here**
>>> **Table 5 here**

As current wage levels often depend on past wage levels, one would prefer to estimate a dynamic model by adding a lagged dependent variable as an explanatory variable. In that case the strict exogeneity assumption is violated, and estimating a dynamic FE model may produce biased estimates due to the presence of correlation between the lagged dependent variable and the disturbance term. However, in a panel with a large time series dimension (a large T), as in our case, the bias is likely to be small (see Bond, 2002), and hence we estimate a dynamic FE model after all. Nevertheless, as a robustness check, we use the instrumental variable approach and estimate the model with the 2SLS method to

account for the endogeneity of the lagged dependent variable.[9] It is difficult to find suitable instruments, but we use the lagged dependent variable as an instrument for the differenced dependent variable. The results from the dynamic FE and the 2SLS methods are presented in Tables 4 and 5 (Columns 4 and 5 for skilled workers and Columns 8 and 9 for unskilled workers). As observed, the large standard errors for the openness coefficient from the 2SLS estimation indicate that they are less precise than the dynamic FE estimates. This might be due to using weak instruments. We therefore prefer the dynamic FE estimates and hence focus on those results (Tables 4 and 5, Columns 4 and 8) in the following discussions.

In both the basic and the general specifications, respectively in Table 4 and Table 5, we find that the coefficients for the lagged dependent variables are large and statistically significant (Column 4 and Column 8 for skilled and unskilled workers respectively). This suggests that the dynamics of the equations are important. The coefficients for the openness variable are, as expected, significant and positive for both skilled and unskilled wages in both the basic and the general specifications of the model. Importantly, the increase is larger in magnitude for unskilled workers than for skilled workers; the coefficients are, for instance, 0.278 (Table 5, Column 8) and 0.176 (Table 5, Column 4) for unskilled and skilled wages respectively. The wage increase is even larger when we calculate the same openness coefficients for a steady state of the model: 0.562 and 0.315, respectively. This implies that a 1% increase in openness increases unskilled wages by about 0.3% in the short

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[9] The difference GMM by Arellano and Bond (1991) was also used, employing second lag of the dependent variable as an instrument for the differenced dependent variable. The estimator, however, provided less precise estimates and hence the results are not reported here.

run and by about 0.6% in the long run. For skilled workers, the short- and long-run increases are about 0.2% and 0.3%, respectively. However, based on a Z test we can not reject the null hypothesis of equality of the openness coefficients from the dynamic FE specification as reported in Columns 4 and 8 of Table 5 (p-value >0.10), implying that the larger increase in unskilled than skilled wages is not statistically significant at conventional levels.

The coefficients for relative prices are insignificant (Table 5, Columns 4 and 8), which may suggest that openness has increased real wages through channels other than price changes. The coefficient for the human capital proxy is found to be statistically insignificant for skilled wages but significant for unskilled wages. We do not have a good explanation for this. It should be mentioned here that the measure of human capital used in our analysis is partial and does not fully capture the stock of human capital. However, the main results for the openness coefficient remain unchanged with the inclusion of the human capital and relative price variables (Table 5, Columns 4 and 8), which indicates that our main finding regarding the impact of openness on real wage of skilled and unskilled workers is robust.

5. Conclusions

The findings in this paper, based on a panel data analysis, indicate some weak evidence that trade openness contributes to a reduction in wage inequality between skilled and unskilled workers in the Bangladesh manufacturing sector. The results also suggest that wages for both skilled and unskilled workers increase, possibly caused by the overall productivity increase resulting from the liberalization-induced increase in competition. The results are

broadly consistent with previous findings in Asia and Africa (Durevall and Munshi, 2008; Bigsten and Durevall, 2006; Mishra and Kumar, 2005), but different from those in many other developing countries. Regarding the previously mentioned Latin American experience, increased wage inequality was mostly due to an increased demand for skilled labor (Esquivel and Rodriguez-Lopez, 2003; Sanchez-Paramo and Schady, 2003; Attanasio et al., 2004). This is in contrast to the East Asian experience of increased demand for unskilled workers which contributed to a reduction in wage inequality (Wood, 1997). The reduction in wage inequality in the Bangladesh manufacturing sector was possibly due to a similar increased demand for unskilled workers. The increased inflow of foreign direct investments (FDI) in the 1990s may also have influenced the wage gap reduction in our case. However, we could not test this as the inclusion of FDI inflow as an explanatory variable would substantially reduce our estimation sample.

Given their potential role in explaining skilled-unskilled wage inequality, the incorporation of other issues into the analysis, such as informal sector, technological progress, inflow of FDI, and extent of privatization, could provide additional insight. However, lack of data restricts our ambition to analyze their effects. Future research should focus on the above issues, given that more and more countries are pursuing trade liberalization.

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Table 1. Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max	N
Log of skilled wage	4.2311	.2768	3.3824	5.007	140
Log of unskilled wage	3.9456	.2834	3.2196	4.584	140
Log of relative price	3.6907	.6072	2.4604	4.8728	140
Log of openness	-.0662	.1287	-.4099	.2070	140
Log of human capital	3.2561	.2191	2.8848	3.5698	140

Table 2. Levin-Lin Test Statistics for a Panel Unit Root Test

Variable	Test statistics
Log of skilled wages	-5.923**
Log of unskilled wages	-6.242***
Log of relative price	-7.753***

Notes: The time period is 1975-2002. One period lag is included. All the regressions contain an intercept and a time trend. *** and ** denote statistical significance at the 1% and 5% level respectively.

Table 3. The ADF Test Statistics for a Unit Root Test

Variable	Lags	t-ADF	Estimated root
Log of openness	0	-4.00**	0.26
Log of human capital	0	-2.331	0.60

Notes: The time period is 1975-2002. All regressions contain an intercept and a time trend.
The superscripts *** and ** denote statistical significance at the 1% and 5% level respectively.

Table 4. Estimated Wage Equations for Bangladesh Manufacturing Industries (1)

Dependent Variable	Skilled wages				Unskilled wages			
Regression method	(2) OLS	(3) FE	(4) Dynamic FE	(5) 2SLS	(6) OLS	(7) FE	(8) Dynamic FE	(9) 2SLS
Openness	-0.032 (0.196)	-0.032 (0.113)	0.180** (0.084)	0.223 (0.171)	0.178 (0.218)	0.178 (0.101)	0.286*** (0.079)	0.482** (0.123
Lagged skilled wages			0.456*** (0.065)	0.541*** (0.079)				
Lagged unskilled wages							0.536*** (0.069)	0.573*** (0.074)
R Square	0.63	0.83	0.89		0.85	0.90	0.92	
N	140	140	135	130	140	140	135	130

Notes: All variables are measured in logarithms. A linear time trend and a constant are included in the regressions. Robust standard errors in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level respectively.

Table 5. Estimated Wage Equations for Bangladesh Manufacturing Industries (2)

Dependent Variable	Skilled wages				Unskilled wages			
Regression method	(2) OLS	(3) FE	(4) Dynamic FE	(5) 2SLS	(6) OLS	(7) FE	(8) Dynamic FE	(9) 2SLS
Openness	-0.015	-0.017	0.176**	0.156	0.173	0.172*	0.278***	0.416***
	(0.219)	(0.107)	(0.085)	(0.152)	(0.229)	(0.100)	(0.079)	(0.085)
Relative price	-0.157	0.076	0.007	0.033	-0.082*	0.062	0.015	0.032
	(0.076)	(0.049)	(0.04)	(0.059)	(0.035)	(0.046)	(0..039)	(0.073)
Human capital	-0.511*	-0.468***	-0.142	-0.392***	0.082*	0.178	0.197**	-0.399**
	(0.207)	(0.122)	(0.099)	(0.058)	(0.036)	(0.114)	(0.097)	(0.094)
Lagged skilled wages			0.442***	0.451***				
			(0.066)	(0.076)				
Lagged unskilled wages							0.506***	0.512***
							(0.07)	(0.123)
R Square	0.765				0.876			
N	140	140	135	130	140	140	135	130

Notes: All variables are measured in logarithms. A linear time trend and a constant are included in the regressions. Robust standard errors in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level respectively.

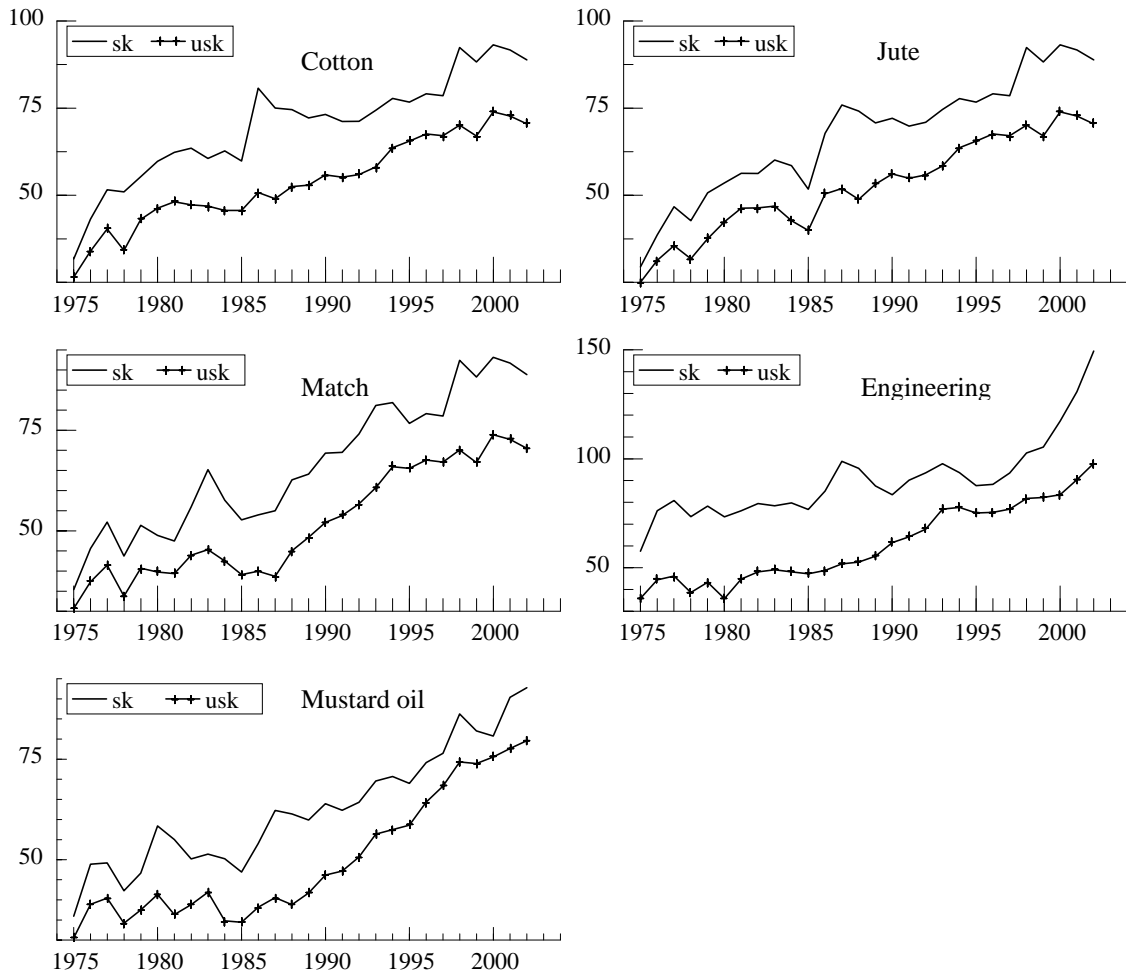**Figure 1. Real Wages, skilled(sk) and unskilled(usk), in Five Industries (1975-2002)**
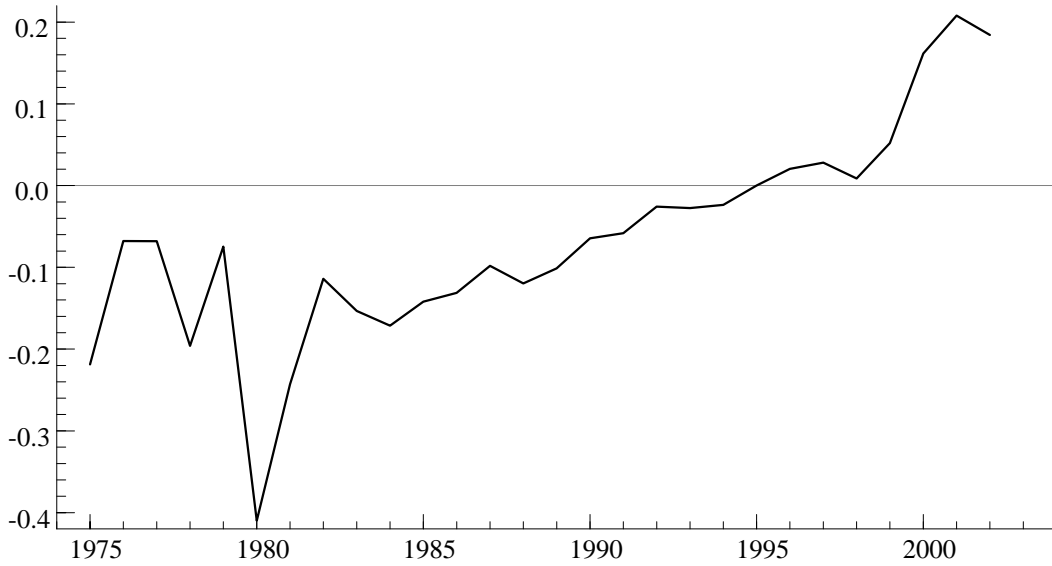
Figure 2. Openness Measure (log)
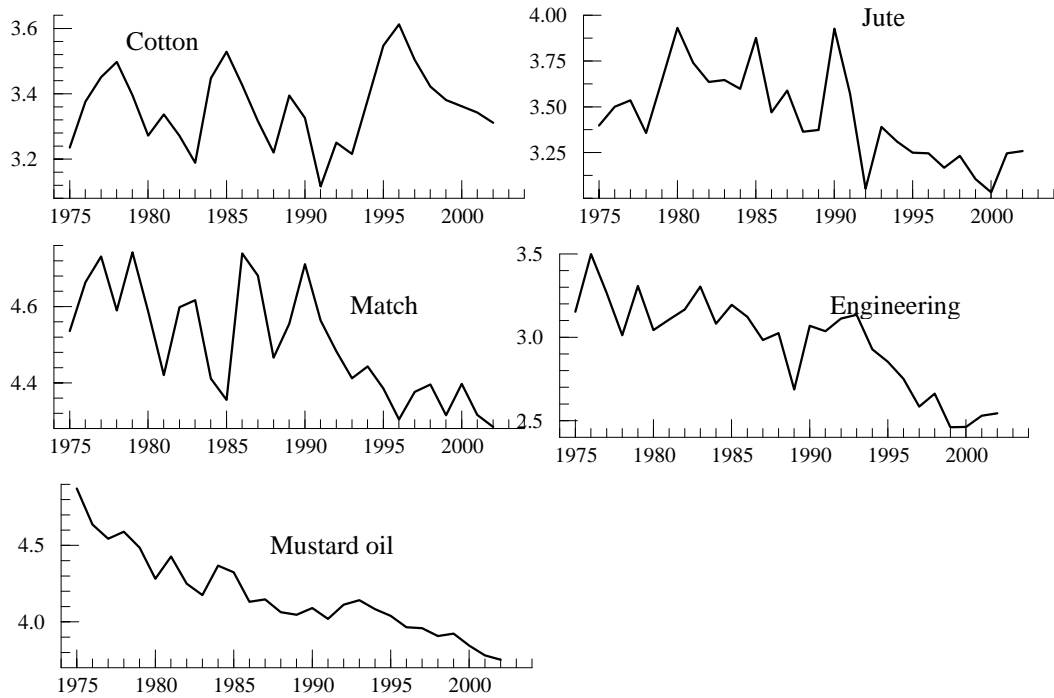

Figure 3. Relative Price (log) Movement in Five Industries

Figure 4. Log of Human Capital (proxy)