LIBERALIZED TRADE POLICY AND INEQUALITY: EVIDENCE FROM POST-MFA INDIA AND SOME THEORETICAL ISSUES

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VARYING IMPLICATIONS OF INTERNATIONAL TRADE POLICIES ON THE LABOR MARKET OF A COUNTRY – EVIDENCES IN LITERATURES

- The wage-employment impacts of unilateral as well as multilateral trade reforms have been studied both theoretically and empirically for developing countries by

1. **Goldberg and Pavcnik, 2007;**
2. **Hasan, Mitra and Ramaswamy, 2007;**
3. **Attanasio, Goldberg and Pavcnik, 2004;**
4. **Hanson and Harrison, 1999.**

- **Aghion, Burgess, Redding and Zilibotti, 2008** explores the relationship between economic reforms and industry-level adjustments at the country level, while
- **Topalova and Khandelwal, 2011** offer substantial evidence on the effects of trade reform on firm level productivity in India in recent times.
- **Marouani , 2009** shows that for Tunisia, withdrawal of MFA has led to an increase in unemployment and wage inequality.

OBJECTIVE OF THE STUDY :

- We deal with a specific trade policy in this paper. This involves the withdrawal of the Multi-Fibre Arrangement, that took effect globally in the year 2005 following a decade long phase out plan.

- We find the implications of this trade policy reform on the aggregate labor earnings, defined as the ***total labor cost*** **(comprising of salaries, wages, bonus and ex-gratia)** ***at the firm level,*** for the workers involved in the textile and allied industries in India.

- Further, we also discuss possible regional differences in firm concentration and wage costs in India arising from the dismantling of the quota system.

Background and Motivation

The economic liberalization of India since 1991 gave the much needed thrust to the textile industry which has now become one of the largest in the world having 2,500 textile weaving factories and 4,135 textile finishing factories in all .

The textile industry continues to be the second largest employment generating sector in India employing over 35 million people distributed between formal and informal organisations.

In addition, the industry still qualifies as the largest net foreign exchange earner earning 27% of the total forex reserve in 2010.

Contd.

Furthermore, the contribution of this industry to India's GDP is about 3-4%, to the industrial production is about 14%.

Despite being the largest net foreign exchange earning industrial sector in India, the industry's share in world exports of textile and apparel is still quite low as compared to other nations, including the Asian giants like China, South Korea, Singapore and Hong Kong.

Not surprisingly, the export promotion policies in India strongly support this sector, which in recent times have become quite sensitive to changing global economic order and to the newly adopted rules.

CONTD.

- Indian textile industry started to integrate fully with WTO from January 2005.
- The MFA was replaced by the ATC (Agreement on Textile and Clothing) which incorporated stages of phasing out quantitative restrictions, at the beginning of 1995, 1998, 2002 and 2005 respectively.
- The impact of this change in policy on the textile workers in India therefore needs to be studied with greater alacrity than what the available literature offers.

The Empirical Model

- We construct a panel of 47 major manufacturing as well as exporting firms between the years 1998 and 2012.
- Our data source is the database of the Centre for Monitoring Indian Economy – *PROWESS*.
- The changes in the *total labor cost* (comprising of salaries, wages, bonus and ex-gratia) *at the firm level* is the explained variable of the model.
- The explanatory variables include, *value of export* of textile and clothing (***Exports***), *total capital stock (**Capital**), net fixed assets (**NFA**), total value of sales (**SALES**)*, and *profit after tax (**PAT**).*

The Empirical Model contd..

- A number of interaction terms are incorporated to measure the relative strength of each of these variables.

- The main hypothesis is whether the ***total labor cost*** borne by the firms has gone down due to the withdrawal of the MFA, thereby reflecting on the question of viability of the firms in the post-MFA regime.

SECTION 1: Firm Level Analysis

- First we have studied different types of indices for the firm level data in order to study the change in the structural features of the market reflected by the changes in the degree of concentration of firms over the years as depicted in Table 1.

TABLE 1: TOTAL SALES AND CONCENTRATION INDICES

Year	TOTAL SALES (in Rs. Million)	CR10	CR50	HHI
1998	458789.7	0.265935787	0.539182549	0.043106
1999	479718.9	0.275774417	0.542131444	0.044875
2000	533338	0.28489757	0.545870911	0.047751
2001	592084.6	0.281744028	0.545416989	0.048478
2002	560916	0.239365609	0.502304623	0.050872
2003	620847.3	0.247778802	0.494131488	0.051525
2004	642901.9	0.263405661	0.521553755	0.052845
2005	717767.3	0.280616991	0.533050753	0.055648
2006	785648.9	0.26945726	0.530489128	0.053036
2007	911765	0.279931232	0.539288852	0.057014
2008	1081350.1	0.280778075	0.542134874	0.057666
2009	1167977.5	0.273324786	0.555342034	0.053614
2010	1269895.9	0.260063837	0.561796995	0.037895
2011	1421381.8	0.260382889	0.591362855	0.030675
2012	928895.7	0.376461319	0.688540059	0.04495

Observations

- All the indices demonstrate an increasing trend of concentration.

- The increased concentration is the natural outcome of the gradual dismantling of quota which led to the survival of only the large, price-cost-competitive firms in the face of potential threat from the low cost international firms.

TWO POSSIBLE OUTCOMES :

- First, the higher concentration and bigger firm sizes may offer better wages owing to complementarities and productivity growth.
- Second, the contraction of many medium and small firms may push the wage to a lower level and therefore reduce the aggregate wage bill for all firms taken together.

The Econometric Model

The detailed econometric specification for *j* firms over *t* time periods defining the panel (with firm fixed effects), is given by:

$$AW = \alpha + \beta_1 Exports + \beta_2 SALES + \beta_3 NFA + \beta_4 PAT + \beta_5 Capital + \beta_6 (Exports * Capital) + \beta_7 (Exports * NFA) + \varepsilon_{it} \quad (1)$$

where,

AW is the aggregate wage bill,

Exports - *value of export* of textile and clothing

Capital - *total capital stock,*

NFA - *net fixed assets*

SALES - *total value of sales*, and

PAT - *profit after tax*

While (β_6, β_7) *are coefficients of the interaction terms used in our model*

Table 2: Descriptive Statistics

Variable	Observations	Mean	Std Deviation
Labour cost	619	438.63	682.72
Export of goods	640	1751.94	2623.46
Export*k	705	1882180	1.18e+08
Net fixed asset	697	4569.67	7851.32
Profit after tax	697	365.907	1805.87
Sales	704	8110.93	12542.13
Total capital	696	556.14	765.87
Export*nfa	705	2.08e+07	1.18e+08

Table 3: Results of Panel Regression using Firm–Level Data

Dependent Variable: Labor Cost (salaries, wages, bonus, ex gratia)			
Variables	1	2	3
Export of goods	0.0357793*** (6.90)	0.0395847*** (7.35)	.059751*** (10.21)
Export*k	-5.37E-06** (-3.70)		
Net Fixed Asset	0.0166355*** (5.89)	0.0193136*** (6.45)	.0420933*** (15.67)
Profit After Tax	0.0324389** (4.54)	0.0340987** (4.78)	.0918143*** (14.94)
Sales	0.0239314*** (12.25)	0.0238961*** (12.35)	
Total Capital	-0.0624798* (-2.11)	-0.083787** (-3.37)	-.091072** (-3.21)
Export*nfa		-6.30E-07** (-4.40)	-9.26e-07** (-5.76)
Constant	135.2114*** (7.33)	130.7036*** (7.44)	181.7428*** (9.34)
R^2	0.7583	0.7624	0.7254

*** = 1% level of sig.; **= 5% level of sig; *=10% level of sig.

Data Source: Centre for Monitoring Indian Economy – Prowess Database

OBSERVATIONS

- Our firm-level empirical estimates show that doubling of export would raise the labor cost bill by 3.5% to 5.9% (estimates 1 and 3, Table 3).
- However, since the rise in capital stock lowers employment and the wage bills, the rise in exports due to capitalization would also lower the total labor cost bill.
- With the same reasoning, a rise in exports attributed to a rise in NFA significantly decreases the labor cost bill although a standalone rise in NFA of the firms seems to push firms towards allocating more resources on labor.

Section 2: The State-Level Analysis

- *The firm-level panel is supplemented by a state-level panel between 1998 and 2008 to document whether the aggregate labor income diverges across states (or regions) thereby offering some indication of regional inequality.*
- *We have chosen **11 major textile producing states of India** which contributes to almost 80% of the total production of the country in order to study the impact of trade liberalization on regional disparity.*

TABLE 4: RESULTS OF PANEL REGRESSION USING STATE-LEVEL DATA

Dependent Variable: lnwage	
Variables	1
log factories	.2878186** (2.21)
profits	-4.16e-06** (-2.21)
Net income	5.60e-06*** (4.62)
Constant	7.840393*** (9.62)
R^2	0.7568

*** - 1% level of sig.; ** - 5% level of sig

Data Source: Annual Survey of Industries, 1998-2008

OBSERVATIONS

- One of the stark results of this panel state fixed effects regression is that the **aggregate state level wage bill falls as the profit level rises for the industry.**
- For other standard variables of interest, namely, the number of factories (***log of factories***), the net income (***net income***) from all factories located in a state, the change in total labor income (*lnwage*, i.e., log of wages, and measuring the elasticity of wage change) is positive and significant.

Impact on Regional Disparity

- Next we focus on the impact of such changes on regional disparity in India, as reflected by the variations in the number of factories, firm-level profits and sales across the states between 1998 and 2008.
- The variation in number of factories across the states over the years is captured by the mean-deviation of the logarithmic values of the number of factories.
- The variations in values of sales over the years, is also calculated in the same manner.
- However, as some firms earn negative profits in some years, such that logarithmic value of profits lead to data attrition, we retain the nominal values of profits only. The results are available in Table 5.

Table 5: Results of Panel Regression on State – Level Data for Regional Disparity

Dependent Variable: Mean - deviation of lnwages	
Variables	l
Mean-deviation of log factories	.4628484 (3.99)**
Mean-deviation of log sales	.6067685 (6.66)***
Mean-deviation of profit	5.67e-07 (0.74)
Constant	-.0008617 (-0.05)
R^2	0.5313

*** - 1% level of sig.; ** - 5% level of sig

Data Source: Annual Survey of Industries, 1998-2008

OBSERVATIONS

- The regional disparity as reflected by the variation in the number of factories located in different states across India have a positive and significant impact on regional differences in total labor income across the states.
- Regional variation in values of sales of the industry shows similar and stronger impact whereas the variation in profit has insignificant impact on variation in log wages.
- The regional concentration of activities therefore additionally reinforces the firm level observations on concentration in the post-MFA regime in India.

A Theoretical Model

- Consider a small open developing country that produces two commodities at world prices $(P_j^*, j = X, Y)$
- X is an import competing good protected by a tariff and
- Y, an export commodity receiving the benefits of protection via bilateral quotas.
- X uses a relatively capital-intensive production technology and Y represents relatively low-skill intensive goods.
- Owing to the benefit of a quota, Y technically enjoys a subsidy at a rate 's' on unit price. Thus, countries which under free trade price one unit of the commodity at P_Y, now face a price $P_Y^* = P_Y(1+s)$

A Theoretical Model (Contd.)

- Algebraically, these features are captured by the following production functions reconstructed into corresponding profit functions in equations (3) and (4)

$$X = X(L_X, K_X) \qquad Y = Y(L_Y, K_Y)$$

where, $Z_j > 0, Z_{jj} < 0, \quad Z_{js} > 0; \; j, s = (L, K), j \neq s, \quad Z = X, Y \quad H_j = 0$

- H_j stands for the Hessian determinant. Under small country assumption commodity prices are exogenous. We hold the price of commodity X as the *numeraire*, i.e., $P_X^* \equiv 1$ and all other prices are expressed in terms of the *numeraire*.
- Thus price of commodity Y, with s as the rate of quota-related subsidy is given by $p^* = p(1+s)$
- Total factor endowments are $(\bar{L} = L_X + L_Y, \bar{K} = K_X + K_Y)$

A Theoretical Model (Contd.)

- Therefore,

$$\pi_X = X(L_X, K_X)(1+t) - \bar{w}L_X - rK_X \qquad \ldots\ldots\ldots\ldots(3)$$

and $$\pi_Y = p(1+s)Y(L_Y, K_Y) - wL_Y - rK_Y \qquad \ldots\ldots\ldots\ldots(4)$$

First – order conditions for profit maximisation,

$$X_L(L_X, K_X) = \bar{w} \qquad \ldots\ldots\ldots\ldots\ldots(5)$$

$$X_K(L_X, K_X) = r = p^*(1+s)Y_K(\bar{L} - L_X, \bar{K} - K_X) \qquad \ldots\ldots\ldots(6)$$

$$p(1+s)Y_L(\bar{L} - L_X, \bar{K} - K_X) = w \qquad \ldots\ldots\ldots\ldots\ldots(7)$$

This set of equations help in determining fully the values of three variables viz. L_x, K_x and w from five parameters, p^*, s, $\bar{L}$, $\bar{K}$ and $\bar{w}$.

A Theoretical Model (Contd.)

- Let us consider a reduction in '*s*'. This is equivalent to a fall in the international price of commodity Y.

  However, this result can be generalized to simultaneous changes in the level of protection received by each sector of the economy . To this end, we fully differentiate (5)–(7) and apply (ds, dt) signifying the price impact of the withdrawal of quota and a change in the tariff rate, on *Y* and *X*, respectively.

  Rearranging, we get equation (8).

$$\begin{bmatrix} (1+t)X_{LL} & (1+t)X_{LK} & 0 \\ (1+t)X_{KL}+p^*(1+s)Y_{KL} & (1+t)X_{KK}+p^*(1+s)Y_{KK} & 0 \\ -p^*(1+s)Y_{LL} & -p^*(1+s)Y_{LK} & -1 \end{bmatrix} \begin{bmatrix} dL_Y \\ dK_Y \\ dw \end{bmatrix} = \begin{bmatrix} -X_L dt \\ -X_K dt - p^* Y_K dt \\ -p^* ds \end{bmatrix} \quad .(8)$$

where $|A| = -(1+t)^2[X_{LL}X_{KK} - X_{LK}^2] - (1+t)p^*(1+s)[X_{LL}Y_{KK} - X_{LK}Y_{KL}]$

with $H_Y = (X_{LL}X_{KK} - X_{LK}^2) = 0 \;,\; |A| \gtreqless 0, \; iff, \; (X_{LK}Y_{KL} - X_{LL}Y_{KK}) \gtreqless 0$

A Theoretical Model (Contd.)

- From Euler's Theorem,

$$X_L L_X + X_K K_X = X$$

Differentiating with respect to L_X

$$(X_{LL} L_X + X_{LK} K_X' = 0) \text{ and } X_{LL} = X_{LL} \Rightarrow (X_{LK} / X_{LL} = -L_X / K_X)$$

and similarly for Y, $|A| = \left[(1+t) p^* (1+s) X_{LL} Y_{KK} \left(\frac{k_Y - k_X}{k_X} \right) \right] < 0$

where, $k_j = (K/L)_j \text{ and } (k_Y - k_X) < 0$

Thus we can find out changes in and (L_X, K_X), w from(8)

A Theoretical Model (Contd.)

- Employment level in X falls with a fall in s, *if*,

$$\frac{dL_X}{ds} = \frac{1}{|A|}\left[X_L(1+t)X_{KK} + p^*(1+s)Y_{KK} - (1+t)X_{LK}X_K\right]\frac{dt}{ds} - \frac{1}{|A|}(1+t)X_{LK}p^*Y_K$$

such that, when $dt=0$, $\frac{dL_X}{ds} > 0$, *iff* $\frac{X_{KK}}{X_{LK}} < \frac{p^*Y_K}{X_L}$ (9)

Also, $dL_X = -dL_Y$

- Since $[X_{KK} < 0]$ employment unambiguously falls in sector X when the subsidy is lifted in sector Y.
- Next, let us look into the impact of the removal of subsidy on the use of capital in sector X. Here

$$\frac{dK_X}{ds} = \frac{1}{|A|}\left[X_{LL}(1+t)X_K\frac{dt}{ds} + p^*(1+t)X_{LL}Y_K + (1+t)X_{KL}X_L\frac{dt}{ds} + Y_{KL}p^*(1+s)X_L\frac{dt}{ds}\right]$$

A Theoretical Model (Contd.)

- Once again, if the tariff rate does not change,

$$\frac{dK_X}{ds} = \frac{1}{|A|}[p^*(1+t)X_{LL}Y_K] > 0 \quad \text{since} \quad [X_{LL} < 0] \ldots\ldots(10)$$

- The impact is just the reverse for sector Y, because

$$dK_X = -dK_Y$$

- In fact, the results would continue to hold in (10) even if both tariff cut and removal of subsidy take place in this economy provided the capital-labor substitution in both X and Y are small at the margin

$$(X_{LL} = Y_{LL} \approx 0)$$

- Finally, let us calculate the effect of s on the wage in sector Y.

A Theoretical Model (Contd.)

$$dw = \frac{1}{|A|}\begin{bmatrix} (1+t)X_L\{-p^* ds(1+t)X_{LL} - p^{*2}(1+s)dsY_{LL}\} \\ +(1+t)X_{LL}\{-X_L dt - Y_L p^* ds\}\{-p^*(1+s)Y_{LL}\} \\ -X_L dt\begin{Bmatrix}\{(1+t)X_{LL} + p^*(1+s)Y_{LL}\}\{-p^*(1+s)Y_{LL}\} \\ +p^*(1+s)Y_{LL}((1+t)X_{LL} + p^*(1+s)Y_{LL})\end{Bmatrix} \end{bmatrix}$$

.....(11)

- Therefore, when dt=0,

$$\frac{dw}{ds} > 0, iff \left[(1+t)X_L p^*(1+t)X_{LL} + p^{*2}(1+s)Y_{LL} + (1+t)X_{LL}Y_L p^{*2}Y_{LL}\right] < 0$$

.....(12)

- Condition in (12) is unambiguously true . However, if the fall in subsidy is accompanied by other instruments of liberalization in this economy, then
- $$\frac{dw}{ds} < 0, iff \quad \frac{ds}{dt} > X_L\left(\frac{B_4 + B_3}{B_1}\right) + \frac{B_2}{B_1} \qquad .....(13)$$

A Theoretical Model (Contd.)

- Where

$$B_1 = \left|(1+t)X_L p^*(1+t)X_{KK} + p^{*2}(1+s)Y_{KK} + (1+t)X_{LK}Y_K p^{*2} Y_{LL}\right| < 0$$

$$B_2 = (1+t)X_{LK}X_K p^*(1+s)Y_{LL} > 0$$

$$B_3 = \{(1+t)X_{KK} + p^*(1+s)Y_{KK}\}\{-p^*(1+s)Y_{LK}\} < 0$$

and

$$B_4 = p^*(1+s)Y_{LL}[(1+t)X_{KK} + p^*(1+s)Y_{KK}] > 0$$

- Equation (13) offers a very general condition which shows that simultaneous changes in (s, t) could even raise the wage in the export sector when the subsidy is lifted, if the relative change in the two rates exceeds a combination of changes in marginal productivities of capital and labor in the two sectors.

CONCLUSION

In essence, our analytical exercise shows the possibility that a stand-alone reduction in subsidy hurts labor in sector *Y*, but a simultaneous fall in protection in sector *X* lowers demand for both capital and labor. Since wage does not change in *X*, *r* falls, and by perfect capital mobility between sectors, the rental return also falls in *Y*. If the fall in *r* is much stronger than the fall in $p * (1 + s)$ (i.e. international price of Y), *w* must rise to reinstate equilibrium.

Inferences:

- Thus, it seems that in the post-MFA regime, Indian firms in the textile and clothing producing sector are increasingly catching up with international competitiveness but at the cost of higher industrial concentration at home for surviving the cost competition.
- The exportability of the firms has increased significantly and it has a positive impact on the aggregate labor income so long as the sector does not become highly capital-intensive.
- The State-level Analysis shows decrease in aggregate wage bill when the profit level rises. Further, regional variations in firm concentration and values of sales impart positive impact on the wage dispersion over time. However, the variation in firm-level profit has little or no impact on variation in labor cost.

Inferences (Contd.):

Our theoretical exercise shows that the dedicated effect of a quota withdrawal is unambiguously harmful for the labor although it is possible to have employment growth. However, when related economic reforms are also initiated in the economy, the detrimental effect of fall in the price of the export good is no longer imminent.

THANK YOU