

LABOR COST AND EXPORT BEHAVIOR OF FIRMS IN INDIAN TEXTILE AND CLOTHING INDUSTRY

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ABSTRACT. The implementation of the Agreement on Textile and Clothing (ATC) of the World Trade Organization (WTO) renders both threats and opportunities to India's Textile and Clothing (T&C) industry in the wake of liberal international trade in the sector. Firms acquire greater international competitiveness through various cost cutting and efficiency enhancing strategies. The question we try to ponder on is what route does Indian firms take to join the international export market in T&C. Empirical analysis, using Tobit estimation techniques, supported the view that increasing the share of low cost labor was an important route through which export performance of the Indian firms in T&C was enhanced. Further, the use of this means to perform better in the international market aggravated in the period after the implementation of the ATC. On the other hand, capital and technology based factors did not have any perceptible effect on the export performance of Indian firms in the international market. This endorses the view that the Indian T&C firms by and large utilized the low road to competitiveness, rather than the other. Also the importance of the import intensity in export performance suggests that Indian T&C is increasingly getting integrated within the global value chain.

JEL: F14, F16, J3

Keywords: export performance, textile and clothing industry, labor cost, Tobit Model, agreement on textile and clothing

1. Introduction

The phasing out of the Multi-Fiber Agreement (MFA) since 1995 and its final repeal in the year 2005 has exposed the hitherto protected textile and clothing industry world over to international competition.¹ This poses a great

opportunity² as well as threat³ to large number of developing economies, who have substantial cost advantages, to access the global market⁴ and join the global value chain in the industry. The developed economies, such as Germany, Italy and Japan, had comparative advantage in the sector from the 1950s till 1980s. Following the rising relative cost in the developed economies the comparative advantage shifted to the developing economies. The MFA quota system kept this comparative advantage of these economies under abeyance, and distorted the cost advantages, distributing the production chain across the developing world, especially to the Latin American countries. The withdrawal of the MFA has brought back the comparative advantages of developing economies to large labor surplus economies such as China and India.

Studies report that South Asian firms, especially Indian firms, are going to be the largest gainers, after China, due to the opening up of the global textile and garments market (Landes, et al; 2005). Projections predict that focus of the supplier countries to the largest markets, of US and EU, in textile and cotton industry is shifting away from traditional economies to China and South Asia. This points that Indian firms, among other Asian firms, are probably becoming internationally competitive. This augurs well for the sector in particular and the economy as a whole. Currently, the industry contributes about 14 percent to industrial production, 4 percent to the GDP, and 17 percent to the country's export earnings. It provides direct employment to over 35 million people, which includes a substantial number of socially and economically backward communities and women. The sector is the second largest provider of employment after agriculture (Government of India, 2009). Thus, the growth and all round development of this industry has a direct bearing on the improvement of the Indian economy.

However, the issue of concern here is the sustainability of this achieved competitiveness of the Indian firms. Under the changed scenario sans quota restrictions, firms in these economies are trying to expand their international market competitiveness through various strategies. These strategies involve a mix of productivity enhancing and cost minimizing activities. Accounted as 'high road' and 'low road' strategies towards achieving competitiveness, the choice between these strategies are critical in determining the long term growth and competitive prospects of the firms.⁵ Yet, international competitiveness of the firms in most developing economies still depend, to a large extent, on the comparative labor cost advantage, under the premise of poor technological capability of these economies.⁶ Given that South Asian economies traditionally had depended on cheap labor cost as the main source of competitiveness, the sustainability of such strategy is doubtful. Moreover,

the dependence on cost minimization strategies rather than productivity enhancing strategies would lead to price war among competing economies pulling the labor earnings in this industry in a downward spiral⁷ which would put the welfare of the labor under question.

Given this background it is important to understand the strategies of the Indian textile and garments firms in achieving export competitiveness. This paper is an attempt to analyze the 'high road' and 'low road' channels of export behavior. This paper analyses the story of export behavior that is unfolding in the period during the MFA phase out and the emerging role of labor cost in the new economic environment. The rest of the paper is organized as follows. Section 2 analyses the trends and patterns in textile and clothing industry. Section 3 puts forward the analytical linkage between the labor factor and export performance, followed by the Empirical Model, Hypothesis and variables defined in the next section. The empirical results are discussed in the fifth section and conclusions are drawn in the sixth and last section.

2. Textile and Clothing Exports: Trends and Patterns

The traditional textile and clothing industry that thrived in India had reduced to shambles under the inimical policies of the British Empire and poor levels of technology. At the time of independence the industry was a disparate set of large sized sick firms mostly focusing on intermediate products, and a large array of unorganized small and tiny firms. Most of the sick cotton mills were nationalized later by 1970s; the early planners sought to protect the industry from competition through import substitution strategies. At the same time the industry was segregated and market was protected based on firm size. The protectionist policies both cross border and cross size class created inefficiencies.

The New Textile Policy in 1985 initiated reforms aimed at removing these inefficiencies in the sector. The textile policy sought to increase the efficiency of the sector through removal of some of the capacity restrictions, liberalized import of textile machinery, enabling export subsidies and technology modernization funds. However, most of this liberalization was limited to natural fibers and their products while man-made textiles were discriminated through excise and custom duties. Some of the products such as garments continued to be reserved for the small scale sector. Following the trade policy reform in the 1990s the import of cotton was liberalized and the tariff structure was brought down. The quantitative restriction on import of textile

products was also removed. To modernize the textile industry the Technology Upgradation Fund (TUF) was set up in 1999, which provided subsidized low-interest loans for technology upgradation within firms. The reservation of product lines for small scale industries were gradually taken away from the 1990s. Foreign Direct Investment was limited to special economic zones and to the product lines where large scale firms were allowed to operate. The discriminatory duties against man-made fibers were brought down by 2000-01. The National Textile Policy (NTP) announced in 2000 the “de-reservation” of garment production for the small-scale sector. The NTP of 2000 also allowed the removal of restrictions in loom capacity, the use of automatic looms, and eliminated the regulation that allowed only small-scale firms to produce garments and hosiery and removed all constraints on foreign direct investment.

Figure 1. Value of India’s Textile and Clothing Exports



Source: UNCOMTRADE database in WITS

These measures of liberalization and rationalization of the sector enabled it to enhance its export performance. While the total exports had increased from US dollars 497 million to US dollars 1950 million during the period 1970-85, growing at the annual rate of 9.7 percent, after the coming of the textile policy in 1985 the export grew at 16.2 percent during 1985-95 to reach US dollars 8482 million in 1995 (See Figure 1). Thereafter, since the advent of the ATC in 1995 the growth rate of exports slowed down to 7.3 percent per annum between 1995 and 2007 and had reached 19559 million US dollars in 2007. The growth rate of clothing products had been higher than textile yarns through out the period.

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Though the volume of exports in textile yarn had been much higher than that of finished clothing traditionally, the increasing export growth in the clothing sector in the period 1970 to 1985 altered the composition of exports substantially. The share of textile yarns in total exports was 95 percent in 1970, which dwindled to 50 percent by 1990 (See Figure 2). Its place was taken over by finished clothing, which increased from 5 percent to 50 percent.

Figure 2. Composition of India's Textile and Clothing Exports



Source: UNCOMTRADE database in WITS

Not only that the trade composition had undergone changes, the directions of trade also changed to some extent. Though US was the prominent market for Indian textile and cotton goods even before the signing of the ATC, the share of US market was much smaller in 1995 due to the quota restrictions of the MFA. For the textile yarns the US market consisted of 13.8 percent of the Indian exports (Table 1). But since the signing of the ATC and the subsequent reduction in the quota restriction the US market has expanded to 22 percent. The presence of European Union (EU) countries in the top 10 importers of Indian textile yarns and fabrics also have increased during the period 1995 to 2005, from 21 percent to 22 percent. Yet, concentration of exports to the top ten economies had declined from 62 percent to 58 percent, essentially underlining the fact that export of this product is changing its direction towards the US and EU markets, and away from other markets.

In the case of clothing industry, the focus on US and EU market had already been in place prior to 1995. By 1995 the US market for clothing had absorbed more than 30 percent of Indian exports, while the EU market took more than 40 percent, and these trends continued till 2005.

Table 1. Top 10 Export Destinations and the percent share

Textile yarn, fabrics, made-up articles			
Country	Year 2005	Country	Year 1995
USA	21.9	USA	13.8
UAE	6.6	UK	9.3
Germany	5.4	Germany	8.7
UK	5.0	Bangladesh	6.6
Italy	5.0	UAE	6.1
Bangladesh	3.7	Italy	4.8
S. Korea	2.8	Belgium	3.7
Turkey	2.8	Japan	3.4
Spain	2.6	Hong Kong	3.1
Sri Lanka	2.2	S. Korea	2.5
Total	57.9		62.1

Clothing			
Country	2005 Year	Country	Year 1995
USA	32.0	USA	30.0
UK	10.6	Germany	13.9
Germany	8.3	UK	9.8
France	7.5	France	7.2
Italy	5.1	Italy	4.7
UAE	4.9	Netherlands	4.2
Spain	4.8	Canada	3.1
Netherlands	3.4	Japan	2.9
Canada	3.1	UAE	2.9
Saudi Arabia	2.1	CIS	2.5
	81.8		81.2

Source: UNCOMTRADE database in WITS

3. Textile & Clothing Exports and the Labor Factor

As shown above the Textile and clothing exports from India had performed well since the domestic policy shift in 1985. However, it can be argued that the export performance of Indian firms is attributable to exploiting the low cost and flexible nature of labor in the industry, especially after enforcement of the ATC. These two aspects, namely low labor cost and labor flexibility are important factors through which Indian firms are acquiring competitive advantage in the US and EU markets. Since the lifting of the quota system, firms from similar low cost economies such as China, Bangladesh and Sri

Lanka are competing in the US and EU markets along with Indian firms. This essentially implies that competitiveness of Indian firms would depend on achieving lower labor cost than these economies. Similarly, the flexibility of work in the sector, many argue, would be an advantage to India, owing to the changing organization of production in T&C sector such as just-in-time production, flexible production and small batch production, which are becoming important in the newly opening up markets of US and EU. In India labor cost cutting and labor market flexibility came about through various strategies. The most commonly identified strategies in this regard are discussed below.

Special Economic Zones and Export Processing Zones as Flexible Labor Zones: In these zones, apart from the common infrastructural and institutional facilities for export promotion they also provide 'congenial labor climate' to the producers. Labor laws in these zones are most often made flexible through the legislative powers of the states, circumventing the central government laws.⁸ Also labor inspections are not compulsory, but based on voluntary disclosure. Such flexibilities allow firms in these zones to use modes of labor cost cutting strategies such as keeping wage rates low, informal contracts of employment etc.

Subcontracted work: A large segment of the work in the garment industry is done through subcontracting. Many a time this would not only entail working in subcontracted small units but also a large share of the work would be home based work by women. Subcontracted work, conducted usually in small informal units are exempted from the labor laws and hence allow ample flexibility in 'hire and fire' and wages. In the early nineties apparel firms subcontracted 74 percent of their output in India, while it was 11 percent for Hong Kong, 18 percent for china, 20 percent for Thailand, 28 percent for south Korea and 36 percent for Taiwan (Kathuria et al, 2003) .

Contractualization: Employing contract labor within the factory units has been another form of labor cost cutting strategy. Data shows that 'contractualization' of work had been rampant in this sector. Even when total employment had been declining in the industry⁹ the share of contractual and casual employment had been increasing over the years. The share of contract workers among employees in the organized manufacturing sector increased from 5.3 percent in 1995–96 to 12 percent in 2003–04 in the textile sector and it increased from 2.04 percent to 8 percent in the apparel segment (Annual Survey of Industries, various issues). Contractual employment, in contrast to permanent employment, is based on either daily wages or piece rate wages. Most often the wage rates of such workers are substantially lower than that of the permanent workers. Moreover, such employment does not attract any of the perks and benefits attached with the permanent workers.

Feminization of labor: The gender based wage differentials are another source that is being tapped by the firms to enhance their export potential. The export segment of this industry is getting increasingly feminized. In the organized textile industry the share of women workers among permanent floor workers increased from 4.7 percent in 1995-96 to 12.19 percent in 2003-04. In case of the garment industry the share of women increased from 11.47 percent to a whopping 60.60 percent (Government of India, 2008).

The flexible 'spirit' of labor market: The 'spirit' of the labor laws is degenerating through many ways. Firstly, the centrally legislated labor laws are being amended at the provincial level to attain region specific advantages for attracting investment. Secondly, the multiplicity of these laws has made it unwieldy to interpret. Moreover, the multiplicity of these laws has created loop holes in the legal frame which is often exploited by erring firms. Thirdly, there is evidence to show that the spirit of implementation of these labor laws has been quite lax.¹⁰ In many states the number of factory inspections conducted during the last few years has declined drastically.¹¹ These aspects have made the labor laws, though powerful in 'letter', more or less powerless instruments in the recent years. This flexible 'spirit' of the labor market has made it amenable to the cost cutting strategies of firms seeking comparative advantage in the international market.

The fading strength of Trade Unions: Trade Unions are losing their prominence in the industry. The number of registered trade unions submitting returns has been steadily declining from 11365 in 1985 to 7309 in 1996 and the claimed membership has declined from 8.19 million to 5.61 million in the period (Gupta, 2003). The increasing flexibility within the labor market is making the trade unions also weaker in their bargaining power (Sharma, 2006). The number of disputes per 10,000 workers has fallen from 1.1 in 1989 to 0.5 in 2002 and there has been a downward trend in the number of man-days lost due to strikes. A weak trade union movement to equate the growing power of capital has also made the labor cost cutting strategies achievable in the recent years than in the previous periods.

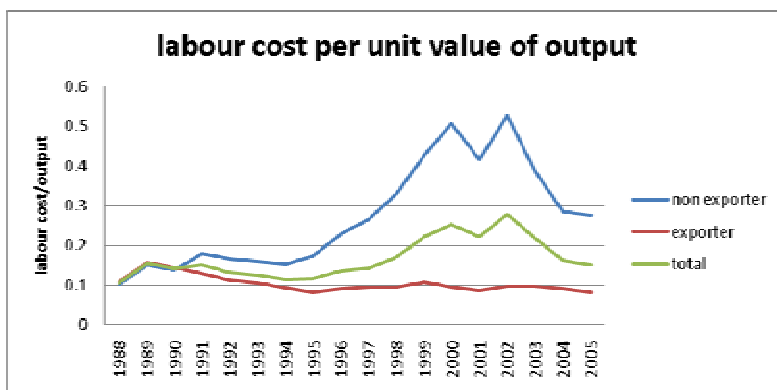
All the above mentioned factors ultimately get expressed in the rationalization of labor use in the sector. This can be noticed in two aspects, a) cost of labor b) share of labor in production process.

The average cost of labor, measured as average wage payments per unit value of output, is estimated separately for firms that were exporters and firms that catered entirely to the domestic market from the available sample. The graphical representation of this is given in Figure 3 below. The cost of labor per unit value of output is consistently higher for the domestic firms in comparison to the exporting firms, since 1990. However, the difference in the labor cost between the two groups had started widening to a large extent after 1995. Till 1995 the cost had been declining for all firms. But after

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1995, the cost for exporting firms started declining marginally from the levels in 1995, while it shot up rapidly for firms in the domestic sector. It is interesting that such a cost differentiation occurred after 1995. This is also the year when the first phase of ATC was first implemented and the first phase of MFA withdrawal also occurred. The firms that experienced the highest labor cost were those that came under the ownership of National Textile Corporation of India (NTC). The primary purpose of establishment of the NTC was to close down or rehabilitate sick industrial units. These firms generate low level of output at high input costs.

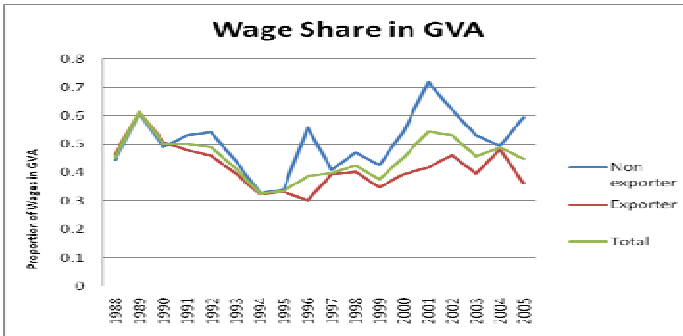
Figure 3. Labour Cost per Unit Value of Output



Source: Prowess database of CMIE

Now we turn to the share of labor in value addition. As a proxy to the share of labor contribution to the total value addition, share of wages in the Gross Value Added (GVA) is used. To contrast the share of labor in GVA between exporters and non-exporters we estimate the average share for exporters and non-exporters separately. The share of wages in the gross value added had been increasing for all firms since 1995 (See Figure 4). Though the increase had been more for the domestic firms than the exporters, the exporters also experienced a rise in the wage share. The share of wages in GVA for all firms in sample had declined from 44 percent to 33 percent during the period 1988 to 1994. Then it rose from that level to nearly 55 percent in 2001, thereafter showing some decline to reach 45 percent in 2005. For the exporters the share of wages increased from 30 percent in 1996 to 49 percent in 2004. Thereafter there is some decline in the last year, 2005. For the domestic firms the increase was from 33 percent in 1994 to 70 percent in 2001. Thereafter it declined to around 50 percent in 2004.

Figure 4. Share of Wages in GVA



Source: Prowess database of CMIE

For the domestic firms the rise in share of wages had occurred along with a rise in cost of labor per unit of output. Therefore it is possible that a large portion of the rise in wage share is owing to the rise in wage cost per unit value of output. In other words, the rise in share of wages in GVA in the sector does not imply that there is increasing employment in the domestic sector. However, for the exporting firms, the cost of labor per output has remained more or less stagnant, with even some marginal decline. But the share of wages in GVA has increased dramatically. This implies that low cost employment is increasing in exporting firms. And, it is this increase in low cost employment in the sector that is leading to the increase in the share of wages of exporting firms. Moreover, the trends in the unit cost of labor and share of wages in GVA had experienced a structural break in the period after 1995, when ATC was implemented. These trends seem to suggest that since the inception of ATC in India, the competitiveness in textile and garments industry seem to be achieved mainly through the extensive use of low cost labor. We now turn towards a formal testing of the argument made above.

4. Empirical Model, Hypothesis and Variable Definitions

To situate the role of labor factor in export performance we calibrate an export behavior model of firms in the Indian T&C industry.

a. Tobit Estimation Methods

The export behavior of a firm can be conceptualized into two decisions it has to make. Firstly, whether it has to engage in exports or not, and secondly if it decides to export then what share of the total sales would it export. In

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notational terms, within the sample of firms a number of firms report exports as nil, hence export intensity = 0, and the rest of the firms have export intensity > 0. Under this set up application of the OLS method, either to the whole sample or to the sub sample of the firms with positive export intensity may produce inconsistent (biased) estimates.¹² The Tobit model is the appropriate model to employ in such cases with dependent variables which are combinations of mass points at the low end of zero, the lower limit and continuous values above the lower limit. For the Indian textile and clothing industry firms the specified Tobit model takes the form:

$$\begin{aligned} EXPIN_{it} &= X_{it}\beta + u_{it} & \text{if } X_{it}\beta + u_{it} > 0 \\ &= 0 & \text{if } X_{it}\beta + u_{it} = 0 \end{aligned} \quad (1)$$

where X_{it} is the vector of k factors that explain the export intensity (EXPIN) of the i^{th} firm in the t^{th} time period. The Tobit coefficients are represented as β , and u_{it} is the error term assumed to be normal with zero mean and constant variance.

Tobit coefficients combine the two types of effects, namely the decision to export and the intensity of export. Hence, the marginal effects of the Tobit coefficients are not directly interpretable, unlike the usual regression coefficients. The McDonald and Moffitt decomposition (McDonald and Moffitt 1980, p.318) of the Tobit coefficients allows to capture the two types of effects: the marginal effect of X_{it} on the probability to export; and the marginal effect of X_{it} on export intensity, once the firm decides to export. The McDonald and Moffitt decomposition for the case of a one-limit Tobit is as follows. Consider the expectation of export intensity, EXPIN:

$$E(EXPIN) = P(EXPIN > 0)E(EXPIN | EXPIN > 0) \quad (2)$$

The effect of a change in the k^{th} continuous variable of X on $E(EXPIN)$ can be expressed as

$$\begin{aligned} \partial E(EXPIN) / \partial X_k &= P(EXPIN > 0) \partial E(EXPIN | EXPIN > 0) / \partial X_k \\ &+ E(EXPIN | EXPIN > 0) \partial P(EXPIN >) / \partial X_k \end{aligned} \quad (3)$$

Thus the total change in the unconditional expected value of EXPIN is decomposed into a) The change in the expected value of EXPIN of those above zero, weighted by the probability of being above zero; b) the change in the probability of being above zero, weighted by the conditional expected value of EXPIN.

In this study we have estimated the Tobit coefficients, based on the pooled data and the Random effects model. The Mcdonald Moffit decomposition is done based on the pooled Tobit estimates.

b. Hypotheses, Variable Definitions and Data Sources

Expin is the dependent variable and it measures the Export intensity. It is calculated as the total Forex earnings from sale of goods divided by total sales.

The Low Road to International competitiveness through Cost Cutting strategies: The low road to competitiveness comes through a combination of strategies wherein the provisions explained above are used to employ low cost and flexible labor in increasing shares, and also to source out labor intensive parts of production to small informal production units that falls outside the ambit of labor regulations.

Labor cost and labor share: Firms in developing economies acquire their competitiveness, to a large extent depending on the use of low cost labor. Though, in India it is argued that the labor cost and employment in the organized manufacturing sector is by and large fixed due to the presence of inflexible labor laws and collective bargaining institutions, a plethora of strategies, such as feminization of work, contractualization of work, setting factories in SEZs and EPZs, the leniency creeping in implementation of labor laws and the weakening of the trade unions enable the firms to reduce the labor cost per unit of output. Firms that involve in exports, it is hypothesized, tend to depend more on labor cost cutting measures to achieve competitiveness. Hence firms that decide to export would depend on labor cost as the crucial factor in their decision making. Firms that have access to low cost labor would tend to become exporters than firms that do not have access to low cost labor. Similarly, firms that want to increase their export intensity also would depend on the change in the labor cost. The Heckscher-Ohlin model forms the basis for this argument of low factor cost based comparative advantage. Researchers have argued that labor costs are a crucial variable in empirically explaining exports from developing economies. Riveros (1988) compared labor cost levels and international labor cost differentials and concluded that even after standardizing by productivity, there are important cost differentials between industrial and developing countries which is associated with manufactured exports from developing economies. Amable and Verspagen (1995) and Van Dijk (2002) also found that unit labor cost was an important explanatory variable in supplier driven exports. *Labor-cost* is defined as labor cost per unit of sales and is measured as Salaries, wages and other labor charges divided by total sales.

The same set of factors as explained above would necessitate exporting firms to depend on larger share of labor in the production process. Hence it is

hypothesized that the share of labor in the firms would have a positive bearing on exports of the firms. *Wage-share* is defined as the share of wages in value added. It is calculated as Salaries & wages divided by gross value added.

Subcontracting intensity: Exports are expected to be positively related with subcontracting intensity of a firm. It is often argued that firms resort to cost cutting by also subcontracting parts of the production process to other smaller firms. Ramaswamy (1999) argued that one of the reasons for Indian firms to get engaged in subcontracting was to circumvent the institutional rigidities of labor. Labor cost becomes downwardly sticky in the presence of labor market institutions. This can be overcome through subcontracting. Ramaswamy (1999) had used the value of goods sold in the same condition as purchased as a measure of the value of product subcontracting. Following the same logic subcontracting intensity, *Subcontract*, is estimated as Purchase of finished goods by a firm divided by its Cost of production.

Import intensity: A firm, functioning from the developing economy within the global value chain, usually would need to import large share of its final output, which would be exported for value addition at the next stage in the chain. In such cases the import intensity would be high for exporting firms. However, in the case of Indian Textile and clothing industry, it is argued the structure of the Indian T&C industry is such that all the intermediate processes from raw material to the final output is done within the country and then exported. Studies done on Indian firms provide contradictory evidence on the effect of import intensity on export performance. Pant (1993), Export-Import Bank of India (1996), and Dholakia and Kapur (1999) find a positive influence but Siddharthan (1989) and Patibandla (1992) find a negative relationship between import intensity and firm level export performance in India. The effect of import intensity is thus ambiguous and needs empirical verification. *Impint* is the indicator for Import intensity. It is measured as Total forex spending divided by sales.

The High Road to Competitiveness through efficiency enhancing strategies: High road to competitiveness is through the achievement of greater efficiency and productivity in production and marketing. This in turn is achieved by engaging with higher levels of technology and innovation, capital intensity, foreign investment, etc.

Technology intensity: Firms obtain their technological capability from different sources. Formal R&D conducted by the firm is only a small part of the total R&D in developing countries, rather learning and adapting the technology to the local conditions is the main form of innovative activity that firms take up (Romjin, 1999). However this informal part of the innovative activity is difficult to capture in data. Firms also acquire their technological capability by purchasing exclusive rights over innovations. Also, another

important source of acquiring technology capability is through the import of technology embodied capital. A technology index build for firms in Mauritius by Wignaraja (2002) and in Kenya by Wignaraja and Ikiara (1999) was found to be positively related with exports. Testing the relationship between technology import and export performance of Indian firms Dholakia and Kapur (1999) found a positive relationship. Montobbio and Rampa (2005) assessing the impact of technology and structural change on export performance in nine developing countries, namely, Argentina, Brazil, China, Columbia, India, Malaysia, Mexico, Singapore and Thailand reported a positive and significant relation. R&D intensity was found to be positively related with export intensity in studies in Brazil by Willmore (1992) and Germany (Wagner 2001).

Within the framework of the paper this variable is of paramount importance. As proposed in the introduction, high road to export competitiveness in the textile industry is linked with high levels of innovation which gets reflected in technological intensity of a firm. Firms that are moving on the high road to competitiveness through higher productivity and efficiency would certainly have a higher technology intensity than firms that follows the low road to competitiveness through cost cutting strategies. In this paper it is hypothesized that technology intensity has a positive effect on export performance of the firms. *Tech_int* is an indicator for technology intensity. Technology intensity is measured in the paper as the sum total expenditure on R&D, expenditure on patents and copyrights such as royalty payment and import of foreign technology as a ratio of sales.

Capital intensity of the firm: The Heckshier-Ohlin trade theory predicts that labor abundant developing economies may export labor intensive goods while capital abundant developed economies have a comparative advantage in capital intensive goods. In line with this argument exporting firms in Germany were found to be much more capital-intensive than the non-exporting firms indicating positive influence of capital intensity on export performance (Bernard and Wagner 1996). On the other hand, many studies done on Indian firms show that capital intensity has a negative influence on export performance from Indian firms (Pant, 1993; and Kumar & Siddharthan, 1994). But Wakelin (1998) argues that to the extent that the capital embodies past innovations even in developing economies it would positively influence export performance of firms. In this paper it is hypothesized that capital intensity would have a positive effect on the export performance of the Indian firms. The indicator for capital intensity is normally taken as capital labor ratio. However, the data does not provide information on total employment in the firms. Hence, we use the alternate measure of capital output ratio. *Capint* is Capital-output ratio calculated as Net fixed assets divided by value of output.

Foreign equity: Firms that are multinational enterprises usually have access to superior production technology and managerial capacity, have

greater scale economies and share resources. They also possess knowledge of foreign markets. These attributes enhance the potential for exports of the multinational enterprises. Studies by van Dijk (2002) and Ramstetter (1999) on Indonesian firms, Brouwer and Kleinknecht (1993) on Dutch firms and Wilmore (1992) support this hypothesis. Hence in this study foreign equity participation is expected to have a positive effect on export performance. *Foreigndum* is the indicator for foreign equity presence in the promoters share holding. It is expressed as a dummy variable with firms that have foreign promoters share greater than 10 percent taking the value 1.

Policy changes Agreement on T&C dummy: The Agreement on T&C of the WTO throws open greater levels of competition for the Indian firms. While Indian firms, after the ATC are freer to compete in the international market, they are also constantly under the threat of being competed out by firms from other developing economies, spurring a cost cutting war. To test this hypothesis we use ATC dummy for the phase wise relaxation of the MFA. Further interaction variables of the ATC dummy and labor cost; and ATC dummy and wage share was developed to test the hypothesis that Post MFA the export dependence on labor cost and labor share has increased. The ATC has four distinct phases of implementation. The first phase of the ATC came to place on 1 January 1995. Each party would integrate into the GATT products from the specific list of products in the Agreement which accounted for not less than 16 per cent of its total volume of imports in 1990. At the beginning of Phase 2, on 1 January 1998, the cumulative share of products integrated to GATT should be at least 33 per cent of 1990 imports. On 1 January 2002, cumulated products should not be less than 51 per cent of 1990 imports. All remaining products would be integrated at the end of the transition period on 1 January 2005. We add dummies to capture the four phases of ATC implementation and search for effects of the labor cost and wage share on export performance at each level of the implementation of the ATC. *ATCdum* is the indicator for the WTO Agreement on T&C. It takes the dummy values ATC dummy = 0 if year < 1995;=1 if year >=1995;=2 if year >=1998;= 3 if year >= 2002;= 4 if year =2005.

Other variables such as *Size* of the firm and *Age* of the firm are added as control variables. These variables apart, to control for temporal variations and sub-industry level heterogeneity, time dummies and industry dummies are added along with the pooled Tobit estimations.

The data has been obtained from the Center for Monitoring Indian Economy (CMIE), PROWESS database. This data base provides information of firms that are listed in National Stock Exchange and Bombay Stock Exchange. CMIE compiles the information from the Balance sheets of the firms. Firm level data for the period 1988 to 2005 is used for the analysis. The data is an

unbalanced panel. The lowest number of reported firms is in 1989 with 106 firms, and the highest in 2002 with 505 firms. The period of analysis has been mainly limited by the availability of data. 1988 is the earliest year for which CMIE data of firms in this sector is available. There are a total number of 5848 observations spread over the period 1988 to 2005.

5. Empirical Results and Interpretations

The result of the Tobit estimation is provided in Table 4. The overall significance level of both the pooled estimate model and the random effects model are very high, as indicated by high value of Wald Chi-square statistic. The check for severity of multicollinearity that can contribute to inflating standard errors for the estimates, variance inflating factor (VIF) and condition index (CI) are presented in the appendix. The VIF and CI indicate no serious multicollinearity among variables.

As expected *labor cost per unit of output* has a negative effect on export performance as expressed in the pooled Tobit estimate. The Tobit coefficient was negative and significant at one percent level. The negative relation between unit labor cost and export performance is significant and negative in the random effects Tobit estimate as well. The *McDonald Moffit decomposition* of the same shows that for one percent increase in unit labor cost the probability of a firm being an exporter declines by -.210 percent. Also, once the decision to export is made, for one percent increase in average unit labor cost, the export intensity would decline by -0.08 percent. Interpreting the size of the decomposed effects, it can be stated that the effect of a higher labor cost in textile and clothing firms deciding not to enter the export market is higher than that of the effect of it on a firm's export intensity.

The interaction effect of the unit labor cost on the dummy variables that represent the various phases of the Agreement on Textile and Clothing has also turned out to be negative and significant at least at 10 percent level in three of the four years. The Random effects Tobit estimates clearly show a gradient in the effect of unit labor cost on export performance. As can be noticed from the Tobit coefficient of the random effects model the effect of unit labor cost in the period prior to 1995, is negative but smaller than the coefficient for the interaction term 'ATCdum1995 x Unitlabourcost' at -0.131. As the ATC was phased in at each time point, in 1995, 1998, 2002 and 2005 the effect of unit labor cost on export performance intensified from -0.131 to -0.316, -0.345 and -0.734 respectively. This gives credibility to the argument that in the post MFA period, the implementation of the ATC would intensify the surge for labor cost based competitiveness among firms.

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Wage share in the Gross value added, contrary to the expectation had a negative and significant Tobit coefficient. The Tobit estimate suggests that the share of wages in GVA had negative effect on export performance. As the share of wages in GVA decreased by one percent, the probability of a firm being an exporter increased by 0.061 percent and the export intensity of the exporting firms increased by 0.025 percent. However this is for the period prior to the implementation of ATC. It can be seen from the table that after the implementation of ATC in 1995 the Tobit coefficients of interaction term of ATC with wage share have a positive sign and the period 1998 and 2005 are at least significant at 5 or 10 percent level. Though not conclusive, this trend suggest that in the post MFA period an increasing wage share is associated with the enhanced export performance of the Indian T&C firms.

Combining the above aspects on labor, namely labor cost, and wage share in GVA it can interpreted that the Indian T&C firms are both entering the export market and enhancing their export performance by decreasing their unit labor cost and increasing their share of labor in the production process in the period after implementation of the ATC.

The strategy seems to be bearing fruit as well. As can be seen below from the Table 4 the Tobit coefficients for the ATC dummies for the period after implementation of ATC are positive and significant in three of the four years. This suggests that the export performance of the firms in the ATC regime have improved compared to the MFA regime. The quota regime that Indian firms were suffering from has been dismantled and there is a larger international market space available. The probability of entry in the export market as well as export intensity has increased in the ATC period.

However, subcontracting seems to have a negative, rather than positive effect on export performance, though the variable is not statistically significant.

Technology intensity, one of the variables intended to indicate high road to competitiveness has shown positive sign but is not statistically significant. Capital intensity has come out with negative results which is statistically significant at 5 percent level. As the capital output ratio increased by one percent, the probability of a firm being an exporter decreased by -0.002 percent and export intensity of exporters declined by -0.0009 percent. These results are interesting in the wake of the argument that Indian T&C firms pursue the low road to competitiveness rather than the high road to competitiveness. In other words, it can be stated that there is no statistical evidence to show that firms that are trying to become technologically advanced through knowledge intensive spending perform better in exports. There is evidence that capital intensive methods of production are domestically oriented, while export oriented firms depended more on the cost cutting measures rather than orienting towards technologically advanced processes.

The presence of foreign equity in the firm seems to produce contradictory results, with the two Tobit coefficients generating different signs and both showing statistical significance. Import intensity has a positive and significant effect on export performance. Higher the import intensity, higher seems to be the probability to export and export intensity also would increase. The relatively higher dependence of export performance on import intensity suggests that the Indian T&C firms are joining the global value chain of the T&C international market. Out of the other control variables both size and age of the firm turned out to be significant and positive generating the expected effect.

Table 4. Tobit estimation of Export intensity in Textile & Clothing Industry

	Tobit coefficients	Marginal effects		Random Effects Tobit
	Unconditional Expected Value	Probability uncensored	Conditional on being uncensored	
	$\partial E(EXPIN) / \partial X_k$	$P(EXPIN > 0)$	$E(EXPIN EXPIN > 0)$	
Unitlabourcost	-0.218*** (3.6191)	-.2103	-.0884	-0.070** (2.2172)
ATCdum1995 x Unitlabourcost	-0.250 (1.2466)	-.2408	-.1012	-0.131 (1.1704)
ATCdum1998 x Unitlabourcost	-0.409*** (4.2866)	-.3938	-.1655	-0.316*** (6.1160)
ATCdum2002 x Unitlabourcost	-0.378*** (3.2299)	-.3640	-.1530	-0.345*** (4.8563)
ATCdum2005 x Unitlabourcost	-1.055*** (4.0052)	-1.015	-.4270	-0.734*** (4.3544)
Wageshare	-0.064*** (3.9411)	-.0618	-.0259	-0.037*** (4.0246)
ATCdum1995 x Wageshare	0.007 (0.1546)	.0065	.0027	0.012 (0.5043)
ATCdum1998 x Wageshare	0.049** (2.4037)	.0475	.0200	0.037*** (3.2115)
ATCdum2002 x Wageshare	0.042* (1.9394)	.0409	.0172	0.020 (1.5564)
ATCdum2005 x Wageshare	0.100** (2.1673)	.0964	.0405	0.069** (2.3096)
Subcontract	-0.268 (1.4378)	-.2581	-.1085	-0.142 (1.5321)
knowledgeintensity	0.004 (0.0916)	.0038	.0016	0.021 (1.0320)
cap_output	-0.002*** (3.3522)	-.0022	-.0009	-0.002*** (4.7478)

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Foreigndummy==1*	0.119** (2.3434)	.1101	.0523	-0.063** (2.1388)
importintensity	0.008*** (3.6053)	.0073	.0030	0.002* (1.7709)
Size	0.0003*** (7.8473)	.0003	.0001	0.0003*** (6.0966)
Age	0.001** (2.4002)	.0006	.0002	0.0002 (1.2258)
ATCdum1995*	0.356*** (2.7288)	.2917	.1799	0.023 (1.4137)
ATCdum1998*	0.426*** (3.2956)	.3727	.1959	0.058*** (5.9789)
ATCdum2002*	0.347*** (2.6818)	.3042	.1620	0.041*** (3.5020)
ATCdum2005*	0.414*** (3.1230)	.3213	.2188	0.055*** (2.6029)
Year Dummy	YES			NO
Industry Dummy	YES			NO
Constant	-0.266** (2.0869)	-.2564	-.1078	0.101*** (10.0463)
Observations	5848			5848
Number of group				642
Sigma	.4074			
sigma_u				.3116
sigma_e				.1955
Log likelihood	-3483.3			-970.7
Waldchi2(21)				294.7
LR chi2(21)	853.6			
Prob >chi2	0.0000			0.0000
pseudo-R2	0.1092			

(*) dF/dx is for discrete change of dummy variable from 0 to 1

6. Conclusion

The implementation of the ATC of the WTO renders a challenge to India's T&C industry. It is an opportunity for the T&C firms in India to establish as lead players in the hitherto restricted international market. It is a threat because it provides the same opportunity to other international players in the field as well. The ability to convert this challenge to an opportunity requires that Indian firms acquire greater international competitiveness. Firms can

achieve greater international competitiveness either through the unsustainable method of production by using larger share of cheap labor, which in turn has negative welfare implications or they can engage in technological improvements and efficiency increases that are sustainable in the long run and have positive welfare implications. The question we tried to ponder on is what route does Indian firms take to join the international export market in T&C.

Though a number of governmental interventions focused on technology upgradation had been on the anvil in the industry since many years, the industry had utilized various strategies to cut labor cost per unit of output and increase its use in the industry. The labor cost reduction was done through a number of strategies such as contractualization of employment, feminization of work, subcontracting of work, relaxation of the implementation of labor laws and weakening of the collective bargaining process. Trends and patterns reveal that low labor cost has been a significant attraction for exporters. They also reveal that since the period of the signing of the ATC there had been a consistent rise in share of labor in value addition.

Empirical analysis supported the view that export performance of the Indian firms in T&C was by exploiting the labor factor to gain access to the international market. Further, the use of this means to perform better in the international market was aggravated in the period after the implementation of the ATC. On the other hand, capital and technology based factors did not have any effect on the export performance of Indian firms in the international market, supporting the view that the Indian T&C firms by and large utilized the low road to competitiveness, rather than the other. Also the importance of the foreign presence and import intensity in export performance support the view that Indian T&C is increasingly getting integrated within a global value chain.

The results of the present study do not present an encouraging picture about the future of the T&C industry. Following an unsustainable path of cost cutting strategies to join the global value chain may in the long run relegate the Indian firms' contribution to the value chain at the bottom with little addition to the cumulative value of the final product. Further, this would worsen the conditions of work and life of the millions of workers engaged in the sector.

NOTES

1. The Agreement on Textile and Clothing (ATC) under the World Trade Organization's (WTO) Uruguay round negotiations stipulates the roll back of the MFA by 2005, wherein a quota system was prevalent, and only tariff barriers can now be exploited to restrict trade in the sector.

2. The opportunity is not only because of possible relocation of trade to developing economies, but also due to expansion in total trade. The annual growth of

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world textile and apparel trade would be 5% higher than before ATC in the 25 year period following ATC (Diao and Somwaru 2001)

3. While quota restrictions limited the market dominance of each exporter, it also meant that all exporters had space in the international market; hence there was no need for competition among the exporting countries. But under the new dispensation developing countries compete among them to capture greater market share.

4. It was precisely the cost advantage that the developing economies enjoyed in the textile and garment industry that led to the protection of the industry in the developed economies through the MFA which came to order in the year 1974.

5. Achievement of competitiveness through cost cutting strategies, especially labour cost were termed as the low road to competitiveness and this route encouraged low margins, large volumes and automation without any basic changes in organization of work or in management practices. This is not sustainable as it pushes competing firms on a 'race to the bottom'. The strategy of the 'high road,' is to be innovative and moving up the value chain, improve quality, differentiate products and be flexible to the volatility of the market (See Tewari, 2005; Piore 2002).

6. Specifically a number of studies report the low level of technology of Indian textile firms. For instance see Bedi (2008, p. 47), US International Trade Commission (2001 P2-1).

7. Chan (2003) and Foo and Bas (2003) argue that the conditions of work in the post MFA period is going to be poor for workers in the textile industry across the world. In the post MFA period large number of workers would lose employment in the Latin American countries, while the conditions of work of the workers in China and India may worsen due to declining wages for increasing competitiveness in the international market.

8. Labor is a subject matter of the concurrent list in the constitution. States have the legislative powers to alter laws that are passed by the Centre. For instance Gujarat and Uttar Pradesh have already passed laws that allow flexible labor arrangements in SEZs.

9. Papola (1994), cotton textiles and food products, which account for one-third of the total employment in the organized sector experienced a decline of more than 3.5 per cent per annum during 1980s, which was mainly due to the closure of a large number of mills because of sickness caused due to several factors and rationalization to overcome obsolescence.

10. For instance, more than 63 percent of the firms that came under the purview of the Factories Act 1948, 2000, did not file returns, and these factories employed nearly 48 percent of the employees (Pais, 2008, p. 94).

11. There is a dire lack of inspecting officials to oversee implementation of these laws. For instance in Punjab the average ratio was one inspector to 996 factories. Andhra Pradesh, Rajasthan and Tamil Nadu had more than 200 factories per inspector, which makes inspection physically unviable (Pais, 2008, p. 78). This, among other reasons has led to a decline in inspections. In Maharashtra the inspection of Factories Act rate fell from 81.3 percent in 1999 to 59.7 percent in 2004 (Sunder, 2008), in Andhra Pradesh from 77 percent in 1982 to 14 percent in 2003; the inspection of ESI Act rate fell from 87.7 percent in 1999 to 29.86 percent in 2004 (Reddy, 2008).

12. See Wooldridge, 2002, pp. 524–525.

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Appendix

Table 1. India's Textile and Clothing Exports Growth (CAGR)

	textile yarns	clothing	Total
1970-75	5.5	41	10.1
1975-80	14.2	27.5	18
1980-85	-2.1	7.7	1.8
1985-90	16.4	23.2	19.8
1990-95	15.3	10.4	12.8
1995-2000	6.7	8.7	7.7
2000-05	7.1	8.7	7.9
2005-07	6.5	4.2	5.3
1970-85	5.6	24.5	9.7
1985-95	15.8	16.6	16.2
1995-2007	6.8	7.9	7.3

Source: UNCOMTRADE database in WITS

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Table 2. Difference in Average Labor Cost and Share of Labor Wages in GVA between Exporter and Non-Exporters in Sample

year	Labour Cost per unit value of output		Share of labour in GVA	
	Non exporters	Exporters	Non exporters	Exporters
1988	0.10	0.11	0.44	0.46
1989	0.15	0.16	0.61	0.61
1990	0.14	0.15	0.49	0.51
1991	0.18	0.13	0.53	0.48
1992	0.17	0.11	0.54	0.46
1993	0.16	0.11	0.44	0.40
1994	0.15	0.09	0.33	0.32
1995	0.17	0.08	0.34	0.33
1996	0.23	0.09	0.56	0.30
1997	0.26	0.09	0.41	0.39
1998	0.33	0.09	0.47	0.40
1999	0.43	0.11	0.43	0.35
2000	0.51	0.10	0.54	0.39
2001	0.42	0.09	0.72	0.42
2002	0.53	0.10	0.62	0.46
2003	0.39	0.10	0.53	0.40
2004	0.29	0.09	0.49	0.48
2005	0.28	0.08	0.60	0.36

Note: outliers dropped (above 20 of labor cost)

Table 3. Test for Multicollinearity (Dummy variable not included)

Variable	VIF	SQRT VIF	Tolerance	R-Squared
expin	1.03	1.02	0.9683	0.0317
size	1.05	1.03	0.9514	0.0486
age	1.09	1.04	0.9193	0.0807
cap_output	1.05	1.03	0.9512	0.0488
Knowledge intensity	1.02	1.01	0.9794	0.0206
Import intensity	1.04	1.02	0.9578	0.0422
Subcontr	1.00	1.00	0.9992	0.0008
Wage share	1.14	1.07	0.8746	0.1254
Unit labour cost	1.14	1.07	0.8746	0.1254
Mean VIF	1.06			