

**Does Trade Liberalization Increase the
Labor Demand Elasticities?
Evidence from Pakistan**

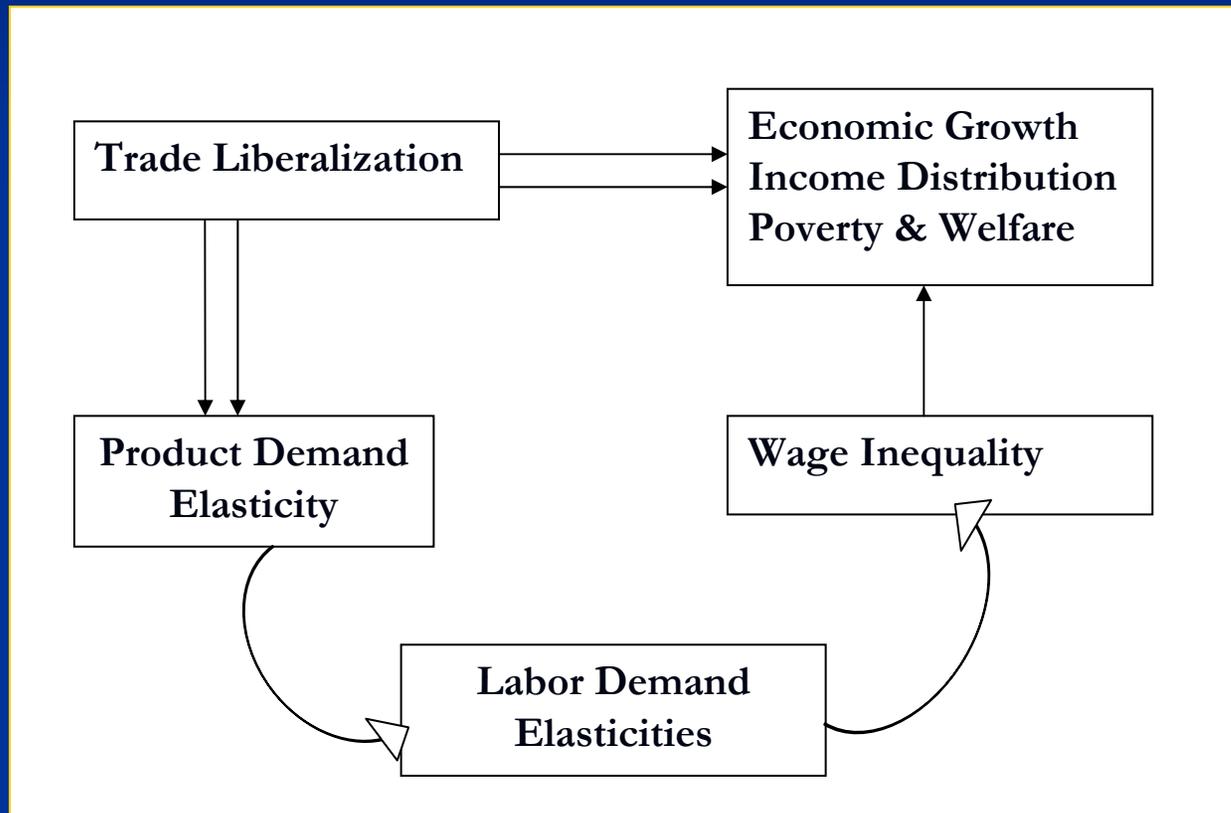
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Introduction

Objective of the Study

- we examine the impact of the trade liberalization on labor demand elasticities of production and non production workers for each eleven industries in the manufacturing sector of Pakistan.
- Also analyze, the behavior of the labor demand elasticities at aggregate level with the openness to international trade, tariff rate and lagged own price of labor.

Importance of the Issue



Kemal (2001), Khan (2003),
Qadir(2000), Siddiqui(2002), Karishna
(2001), Roderick(1997) and Currie and
Hanson(1997)

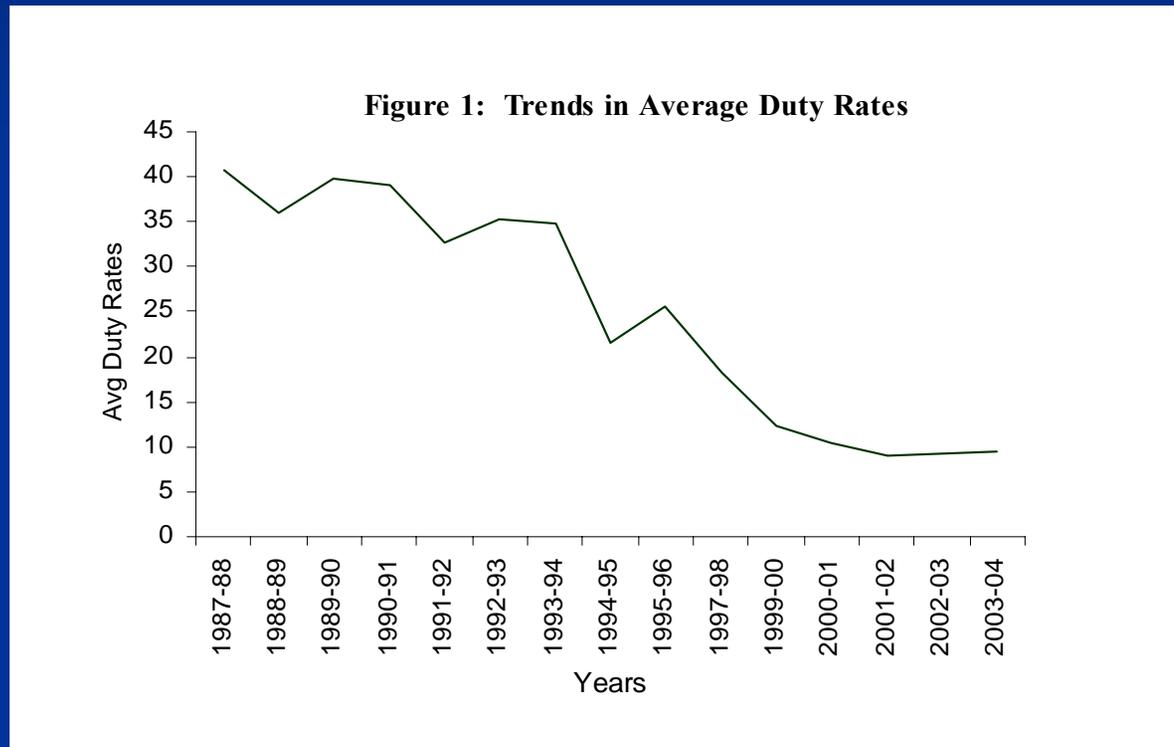
Literature Review

- **Rodrick (1997) examined the issue whether or not trade can change labor-demand elasticities without changing labor prices. Trade can make labor demand more elastic in two main ways:**
 - **Firstly, by making output market more competitive and by making domestic labor more substitutable with foreign factors.**
 - **Secondly, through Hicksian -Marshallian laws of factor demand “the demand for anything is to be more elastic, the more elastic is the demand for any further thing which it contributes to produce”.**

Literature Review

- Slaughter (2001) investigated this hypothesis for U.S production and for non-production worker and find mixed support. In case of production worker positive relationship but in case of non-production it is unresponsive.
- Krishna *et al.* (2001) examined that in the presence of major trade reforms, own price labor demand elasticities are unresponsive to trade reforms in case of Turkey but Krishna (1998) finds support for this hypothesis in case of India.

Trade Reforms



Source: CBR Yearbook.

Trade Reforms

Import Duties According to Category

Year	1990-91	1995-96	1999-2000	2000-01	2001-02	2002-03
Consumer Goods (%)	38	43	19	16	17	11
Capital Goods (%)	39	31	22	20	16	11
Total (%)	39	34	18	17	15	9

Source: CBR Yearbook.

Methodology

- Focus on the profit maximization approach, output is not given rather it is determined endogenously, and monopolistic competition is assumed. By using Cobb-Douglas type production function. Labor Demand equation determined

$$l_{ijt} = \delta_0 + \delta_w \ln(w_{ijt}) + \delta_r \ln(r_{ijt}) + \delta_m \ln(m_{ijt}) + \delta_f(f_{ijt}) + \delta_{TP} TP + e_{ijt}$$

- Subscript 'i' and 'j' represent firm i in industry j

Methodology

- The own price elasticity of demand for labor (w.r.t industry wage) is given as.

$$\frac{\partial \ln L}{\partial \ln \left(\frac{w}{\bar{P}} \right)} = |\delta_w| = \left(\frac{1 - (1 - 1/\varepsilon)(\alpha + \gamma + \varphi)}{1 - (1 - 1/\varepsilon)(\alpha + \beta + \gamma + \varphi)} \right)$$

- The partial derivative of the absolute value of the own price elasticity of labor demand with respect to product demand elasticity is given as

$$\frac{\partial |\delta_w|}{\partial \varepsilon} = \left[\frac{\beta}{\varepsilon^2 [1 - (1 - 1/\varepsilon)(\alpha + \beta + \gamma + \varphi)]^2} \right] > 0$$

Data and Variable Construction

➤ Data Sources

CMI, Monthly Statistical Bulletin, yearly CBR book, Pakistan Custom Tariff

➤ Variable Construction

- Wage Determination

$$W = \left(\frac{TEC}{ADE} \right)$$

Data and Variable Construction

➤ Fuel Prices

Fuel price index is used for proxy of fuel prices

➤ User Cost of Capital

$$P_k = P_m(\delta + r - \pi_m)$$

where

$$\delta = \left(\frac{Dep - C}{VFA} \right)$$

Estimation Procedure

- Estimating equation estimated separately for each industry at first, and then for pooled across industries
- Both ‘fixed effects’ and ‘random effects’ specifications are estimated
- To capture the effect of change in trade policy on the parameters, we include intercept and interactive trade reform dummies

Own Price Labor Demand Elasticities: Fixed Effect and Random Effect Model

Codes	Industries	Fixed Effects			Random effects	
		Δw	$\Delta \delta w$	R ²	Δw	$\Delta \delta w$
311	Food	-0.22 (0.16)	-0.47 (0.970)	0.57	-0.19 (0.148)	-0.41 (0.934)
320	Textile	-0.17 (0.22)	-0.16 (1.638)	0.72	-0.02 (0.301)	-4.29 (2.201)*
323	Leather	-0.34 (0.41)	-0.09 (3.096)	0.12	-0.10 (0.102)	0.54 (1.587)
351	Ind. Chem	-0.12 (0.16)	-0.12 (1.797)	0.73	-0.01 (0.083)	3.04 (0.809)*
352	Other IC	-0.06 (0.06)	0.03 (0.474)	0.63	0.17 (0.138)	-0.55 (1.267)
369	Non-metal	0.64 (0.33)	0.86 (2.355)	0.62	0.08 (0.182)	0.60 (1.781)
371	Iron & Steel	-0.18 (0.24)	-0.16 (1.781)	0.77	-0.02 (0.129)	-0.40 (1.614)
381	Fabricated	-0.02 (0.028)	-0.02 (0.212)	0.25	0.14 (0.136)	0.14 (1.037)
382	Non-elect	-0.35 (0.451)	-0.22 (3.047)	0.77	0.08 (0.057)	-1.5 (0.794)
383	Electrical	-0.11 (0.131)	-0.04 (0.984)	0.27	-0.02 (0.092)	1.78 (0.896)*
384	Transport	0.18 (0.186)	-1.05 (1.302)	0.22	0.06 (0.096)	-0.75 (1.005)

Values in parenthesis denotes S.E.

Elasticities of Production and Non-production Workers: (Fixed Effect Model)

Codes	Industries	Production Workers			Non-Production Workers		
		Δw	$\Delta \delta w$	R ²	Δw	$\Delta \delta w$	R ²
311	Food	-0.22 (0.16)	-0.47 (0.970)	0.57	-0.19 (0.36)	-1.36 (1.11)	0.43
320	Textile	-0.17 (0.22)	-0.16 (1.638)	0.72	-0.30 (0.22)	-0.58 (0.76)	0.78
323	Leather	-0.34 (0.41)	-0.09 (3.096)	0.12	0.67 (0.78)	0.15 (0.89)	0.22
351	Ind. Chem	-0.12 (0.16)	-0.12 (1.797)	0.73	-0.07 (0.25)	-0.85 (0.79)	0.65
352	Other IC	-0.06 (0.06)	0.03 (0.474)	0.63	-0.03 (0.04)	-0.02 (0.12)	0.82
369	Non-metal	0.64 (0.33)	0.86 (2.355)	0.62	-0.37 (0.42)	-1.79 (1.39)	0.2
371	Iron & Steel	-0.18 (0.24)	-0.16 (1.781)	0.77	-0.36 (0.29)	-1.35 (1.16)	0.55
381	Fabricated	-0.02 (0.028)	-0.02 (0.212)	0.25	0.22 (0.31)	1.18 (0.93)	0.13
382	Non-elect	-0.35 (0.451)	-0.22 (3.047)	0.77	-0.39 (0.42)	-0.99 (1.29)	0.72
383	Electrical	-0.11 (0.131)	-0.04 (0.984)	0.27	0.11 (0.16)	-0.46 (0.65)	0.79
384	Transport	0.18 (0.186)	-1.05 (1.302)	0.22	-0.36 (0.56)	-0.39 (0.34)	0.25

Values in parenthesis denotes S.E.

Over the Time Labor Demand Elasticity Estimates: (Fixed Effect Model)

Major Industries		Under Fixed Effect		
Codes		δw	$\Delta \delta w$	R ²
311	Food	0.302 (0.12)	-0.271 (0.04)	0.99
320	Textile	0.909 (0.34)	-0.816 (0.12)	0.98
323	Leather	1.695 (0.64)	-1.544 (0.22)	0.99
351	Indus. Chem	0.655 (0.24)	-0.586 (0.08)	0.99
352	Other IC	0.251 (0.09)	-0.234 (0.03)	0.97
369	Non-metallic	-0.766 (0.29)	0.697 (0.09)	0.99
371	Iron & Steel	0.987 (0.39)	-0.887 (0.13)	0.98
381	Fabricated	0.117 (0.04)	-0.106 (0.02)	0.99
382	Non-electrical	-1.88 (0.75)	1.699 (0.24)	0.99
383	Electrical	0.541 (0.22)	-0.491 (0.07)	0.98
384	Transport	0.0166 (0.02)	-0.004 (0.01)**	0.97

Values in parenthesis denotes S.E.

Regressions using pooled data over all industries

Regression A	Regression B	Regression C
Instrumental variables estimates with the reforms dummy interactions	With Openness measurement (Fixed effect Model)	With actual tariff rates (Fixed effect Model)
δ_w -0.242 (2.45)	δ_w -1.024 (0.67)	δ_w -0.77 (0.42)
$\Delta\delta_w$ -1.076 (5.53)	$\partial\delta_w / \partial(\text{openness})$ 0.618 (2.39)	$\partial\delta_w / \partial(t)$ -0.002 (0.01)
R2 0.288	R2 0.662	R2 0.994

Values in parenthesis denotes S.E.

Conclusion

- The objective of this study is to estimate the responsiveness of the labor-demand elasticities under trade liberalization by for each eleven industries in the manufacturing sector of Pakistan
- Labor demand elasticities are measure by using fixed effect and random effect model.
- The putative linkage between greater trade liberalization and labor demand elasticities (as suggested by theory) may be empirically weak.

Conclusion

- In case of fixed effect model it is evident from our results that there exists unresponsiveness to trade liberalization however under random effect model there exist mixed trend.
- No significant relationship between these variables for both production and non-production workers.
- The important finding is that labor demand elasticities behave differently over the time. These became more elastic over the time

Conclusion

- Hence the change in labor demand elasticities is not related with trade reforms in case of Pakistan. There may other causes that are responsible for this outcome.