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# PATTERNS OF EXPORT DIVERSIFICATION

Evidence from Pakistan

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Introduction

- The World Bank 2013 report identifies "slow product diversification", as reflected in Pakistan's exports, as the key structural constraint which explains "What is holding Pakistan back".

- Usually product diversification is measured by changes in the product concentration index (PCI)

Historical Trend in Degree of Concentration (1972-2012)

- Pakistan has not done too badly on PCI
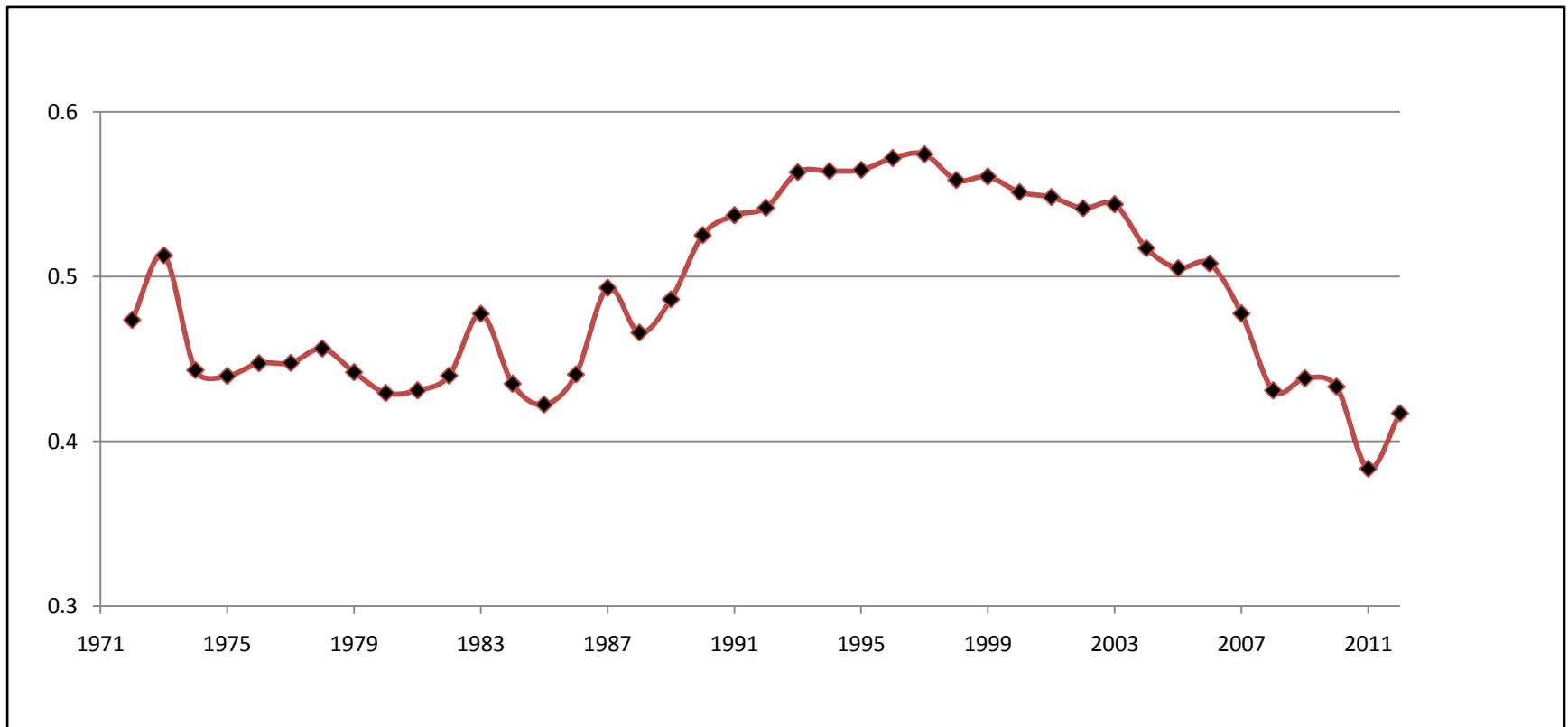
Introduction

- However, there is a need dig deeper into the process of diversification. In this paper we introduce two new measures which allow us to do that.

- Following (Piñeres&Ferrantino,1997), we construct an **Average Traditionality Index (ATI)** for each industry and a **Structural Change Index (SC)** for each year since 1972.

  - ATI is the mean of the cumulative export index for each industry

  - SC is the variance of ATI calculated across industries but using five-year intervals rather than the full sample period

Research Objectives

- Assess the degree of traditionality in all 2-digit export industries over time.

- Study the degree of medium run structural change that has occurred in the country's export sector from 1972 to 2012

- Explore the determinants structural change in the export sector.

Methodology

- To assess traditionality level across industries:

$$trad_t^k = \left.\sum_{1972}^{t} e_t^k \middle/ \sum_{1972}^{2012} e_t^k \right. \qquad (1)$$

$$avg\_trad^k = \left.\sum_{t_o}^{T} trad_t^k \middle/ T - t_0 + 1 \right. \qquad (2)$$

$trad_t^k$ Traditionality Index (or cumulative export experience function) of industry k in year t

$\sum_{1972}^{t} e_t^k$ Sum of real exports for industry k from 1972 to t

$\sum_{1972}^{2012} e_t^k$ Sum of real exports for industry k from 1972 till 2012

avg_trad^k Average Traditionality Index for each industry k between 1972-2012

- To assess medium run structural change:
  - The traditionality index is re-calculated using 5 year intervals (trad5)
  - Variance of trad5 is used as a measure of structural change.

$$sc_t = Var(trad5_{k_0}^k)_t \qquad (3)$$

Methodology

- To study determinants of structural change, the following regression model is estimated:

$$sc_t = \alpha + \beta_1 \boldsymbol{Liberalization}_{t-1}^{PK} + \beta_2 \boldsymbol{PCI}_{t-1}^{PK} + \beta_3 \log(\boldsymbol{RER})_{t-1}^{PK} + \beta_4 \boldsymbol{GDPgrowth}_{t-1}^{PK} + \boldsymbol{\beta_5 Exgrowth}_{t-1}^{PK} + \beta_6 \boldsymbol{Tradegrowth}_{t-1}^{WORLD} + \varepsilon_t$$

$$Liberalization_t^{PK} = \frac{Import\ Duty\ Revenue_t}{NonOil, NonFood\ Imports_t}$$

$$PCI_t = \left(\sum_k W_{it}^2\right)^{1/2}$$

$$RER_t^{PK} = \frac{E_t^{PKR\ to\ USD}.WPI_t^{USA}}{CPI_t^{PK}}$$

$GDPgrowth_t^{PK}$ Growth rate of real GDP for Pakistan,

$Exgrowth_t^{PK}$ Growth rate of exports,

$Tradegrowth_t^{WORLD}$ Growth rate of world trade

Results 1

Ranking according to Average Traditionality Levels (ATI) of 30 main Export Industries, that contributed 97% of total exports in 2012
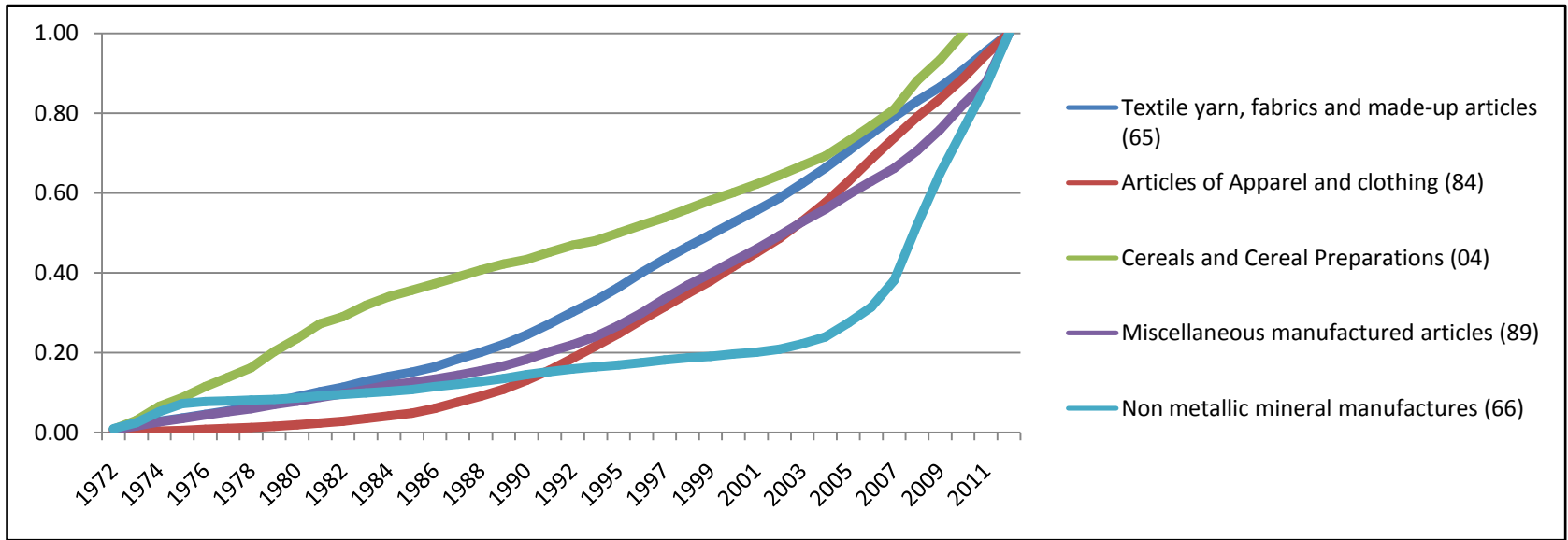
Traditionality Rank of Top Five Export Industries (SITC-2digit level)

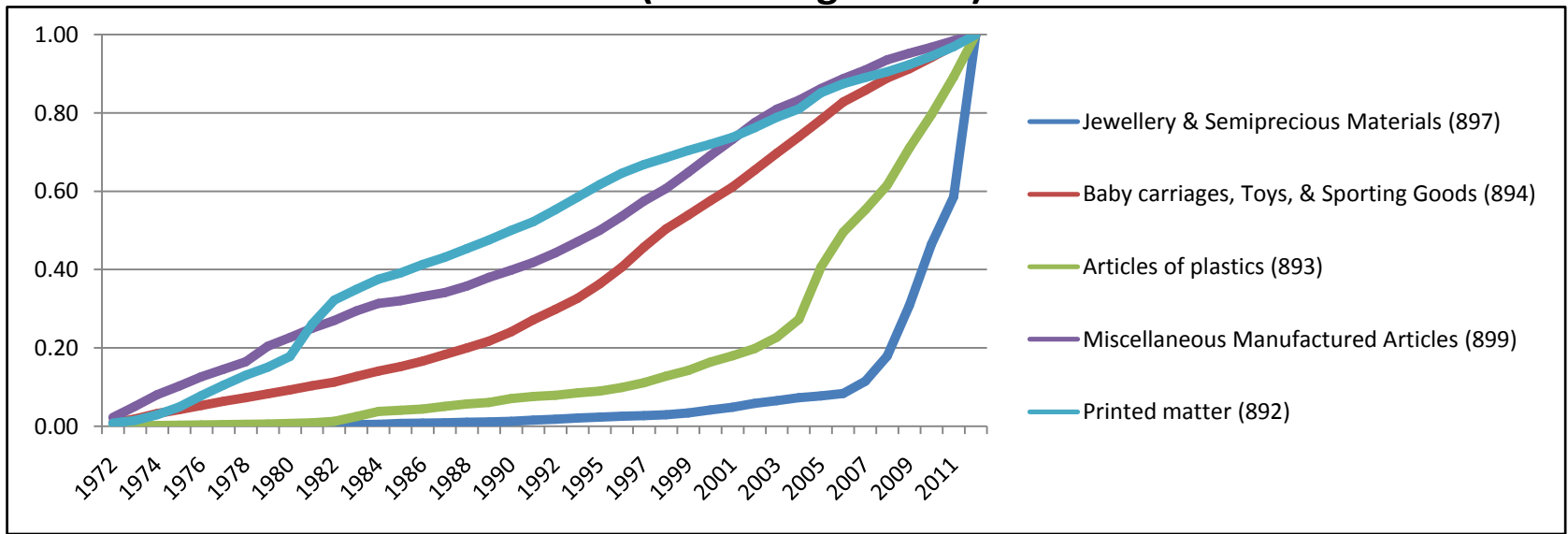| UN Code	Description	Average Traditionality Index	Variance of Traditionality Index	Traditionality Rank	Share in Total Exports (2012)
65	Textile yarn, fabrics, made-up articles & related products	0.363	0.092	19	35.37
84	Articles of apparel & clothing accessories	0.288	0.098	12	17.12
04	Cereals and cereal preparations	0.438	0.066	23	9.44
89	Miscellaneous manufactured articles	0.306	0.075	15	8.62
66	Non-metallic mineral manufactures	0.218	0.051	8	2.55

Traditionality Rank of Top Five Export Industries in the UN89 Category (SITC-3 Digit level)

UN Code	Description	Average Traditionality Index	Variance of Traditionality Index	Traditionality Rank	Share in Total Exports (2012)
897	Jeweller and semiprecious materials	0.084	0.04	1	6.62
894	Baby carriages, toys, games and sporting goods	0.393	0.11	7	0.89
893	Articles, n.e.s., of plastics	0.194	0.07	3	0.44
899	Miscellaneous manufactured articles, n.e.s.	0.498	0.09	8	0.15
892	Printed matter	0.522	0.09	9	0.04

Traditionality Levels Across Top Five Export Industries
(SITC -2 Digit Level)

Legend:
- Textile yarn, fabrics and made-up articles (65)
- Articles of Apparel and clothing (84)
- Cereals and Cereal Preparations (04)
- Miscellaneous manufactured articles (89)
- Non metallic mineral manufactures (66)

Traditionality Levels Across Top 5 Export Industries in UN89 Category
(SITC-3 Digit Level)

Legend:
- Jewellery & Semiprecious Materials (897)
- Baby carriages, Toys, & Sporting Goods (894)
- Articles of plastics (893)
- Miscellaneous Manufactured Articles (899)
- Printed matter (892)

Traditionality Levels of SME Industries (1972-2012)
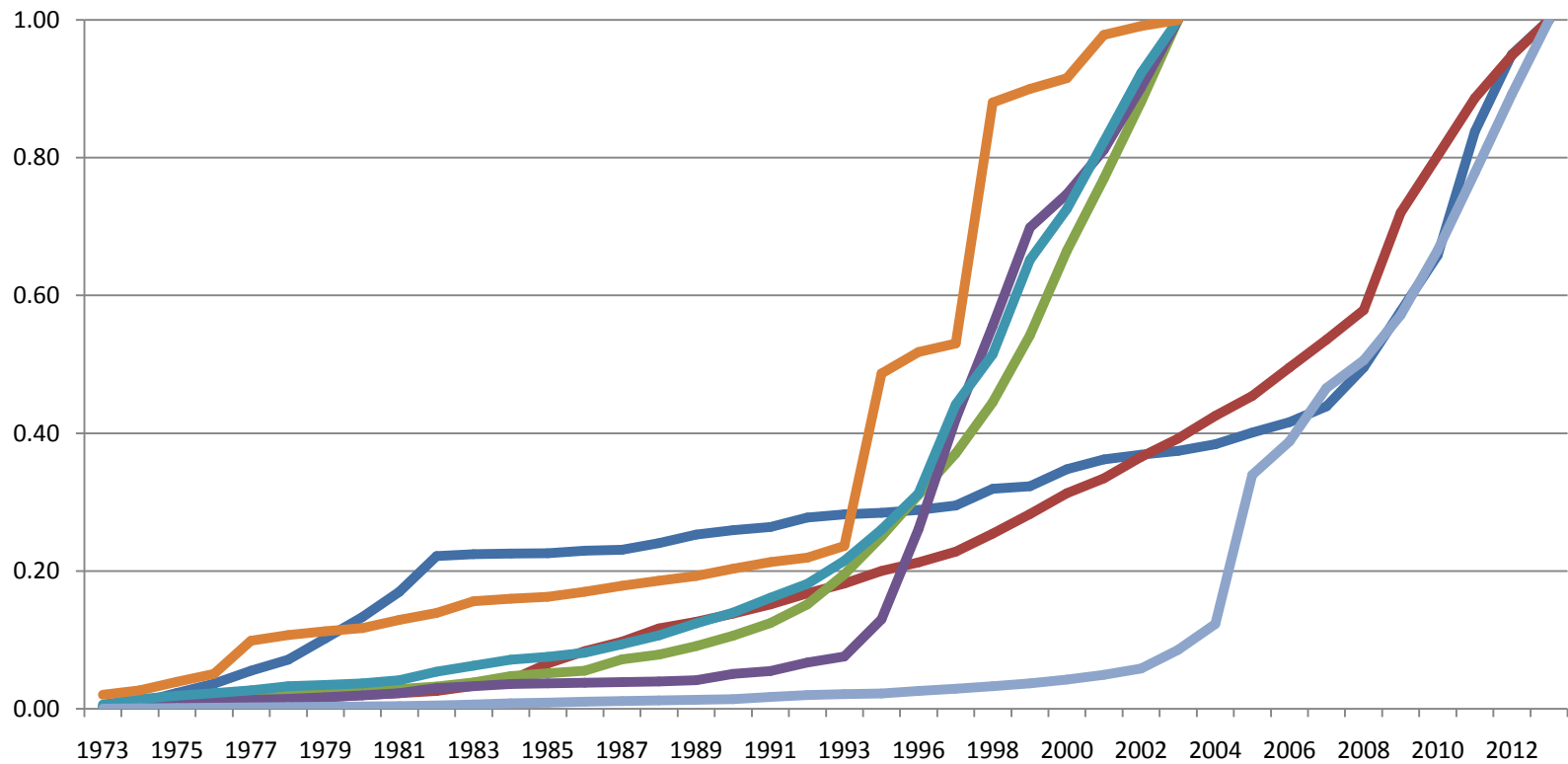
Legend:
- Power-generating Machinery & Equipment (Fans)
- Specialized Machinery (civil engineering)
- General Industrial Machinery & Parts
- Telecommunications & Sound Recording
- Road Vehicles
- Other Transport Equipment (boats)
- Furniture

Results 2

Annual Structural Change Index (1972-2012)

Year	Structural Change Index
1972	
1973	
1974	0.03
1975	0.04
1976	0.03
1977	0.03
1978	0.03
1979	0.04
1980	0.04
1981	0.05
1982	0.05
1983	0.04
1984	0.02
1985	0.03
1986	0.04
1987	0.04
1988	0.05
1989	0.04
1990	0.02
1991	0.02
1992	0.03
1993	0.03
1995	0.02
1996	0.04
1997	0.02
1998	0.03
1999	0.02
2000	0.03
2001	0.03
2002	0.03
2003	0.02
2004	0.02
2005	0.02
2006	0.02
2007	0.02
2008	0.02
2009	0.03
2010	0.03
2011	
2012	

Structural Change Index
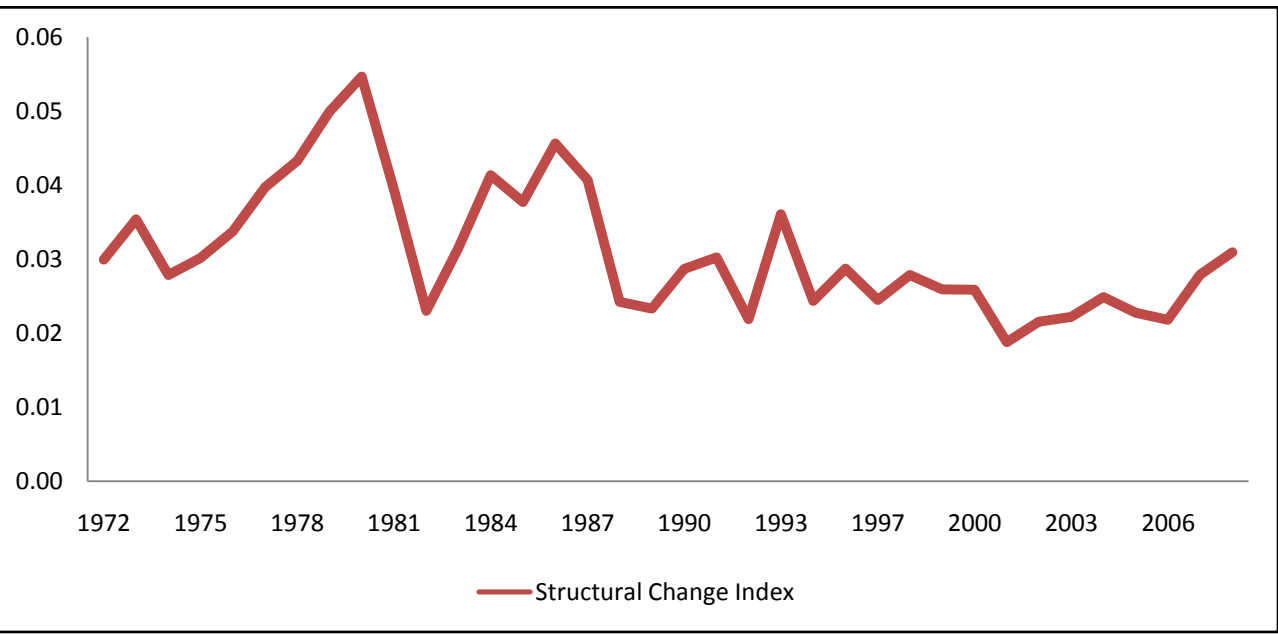
Results 3

Determinants of Structural Change through Regression Analysis

Dependent Variable: Structural Change Index

	(1)	(2)	(3)	(4)	(5)
Liberalization	0.0193	0.0228	0.0137	0.0175	0.0192
	[0.01]	[0.01]	[0.02]	[0.02]	[0.01]
L1(Liberalization)	0.0207	-0.0284*	0.0235	0.0204	0.0226
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
L2(Liberalization)	-0.0317***	-0.0360***	-0.0316***	-0.0311***	-0.0348***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
FD(Product Concentration Index)	0.0630	0.0619	0.0636	0.0623	0.0983
	[0.06]	[0.05]	[0.06]	[0.06]	[0.06]
L1(GDP Growth)	0.000443	0.000514	0.000667	0.000487	0.000572
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
L2(GDP Growth)		0.00130**			
		[0.00]			
L1(Exports Growth)	-0.00561	-0.0115	-0.0117	-0.00439	-0.00852
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
L2(Exports Growth)			-0.000783		
			[0.00]		
L1(RER)	-0.000131	-0.000140	0.0000105	0.0000360	-0.0000397
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
L2(RER)				-0.000187	
				[0.00]	
L1(World Growth)	-0.000131	-0.00000167	-0.0000678	-0.000142	-0.000155
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
L2(World Growth)					-0.000467
					[0.00]
Constant	0.0330***	0.0375***	0.0353***	0.0340***	0.0310***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
N	36	36	36	36	36
R-sq	0.574	0.644	0.589	0.577	0.610
Adj. R-sq	0.448	0.520	0.447	0.431	0.475

Standard errors in brackets

* p<0.1, ** p<0.05, *** p<0.01"

Conclusions

- Trade liberalization seems to be the main factor in affecting medium term structural change in the export sector.

- The current export base is significantly traditional: the share of least traditional industries only accounted for one tenth of total exports in 2012.