The Effect of Tax Incentives on Investment and Profits - Analysis of Exporters in India

Sebastian S. James

IFC, World Bank Group

(email: sjames2@ ifc.org)

Abstract

This paper examines the effect of the changes in tax rates on investment and taxable income for Indian taxpayers. This study uses the removal of tax benefits for income from exports in the year 2000 to examine their response. The unique situation offered by the Indian Finance Act 2000 provides an opportunity to calculate the elasticity of investment to tax rates in the case of India, currently not available in the literature. The evidence shows that the investments were unaffected by the higher tax rates. The evidence also suggests that the likely reason is that the response was in the form of higher evasion rather than lower investments. The policy implications are discussed.

I. Introduction

This paper seeks to find out the impact of investment due to changes in tax rates using a natural experiment that changed the tax rates for one group of taxpayers even while keeping it unchanged for another group.

The Finance Act of 2000 (hence forth referred to as FA2000 or tax reform) conducted wide-ranging reforms of the Indian tax system one of the most important among them being the removal of 100% tax benefit to income earned from exports. This tax reform serves as the natural experiment to measure the response of the firms for the purpose of this paper and uses a seven year panel of 88 garment exporting firms from the districts of Tirupur and Chennai in the State of Tamil Nadu, India having export income during the period 1997-2004, a mix of sole proprietorships, partnerships and corporations. The response being measured is the investment before and after the change during which the tax exemption fell from the full 100% of export income down to 0%[1]. Particularly useful for the purpose of measuring this response fairly accurately is the fact that a section of exporting firms situated in Export Processing Zones were kept out of the change in tax laws. This group then serves as the control group for the purpose of measuring the response of the firms to the raising of effective tax rates by allowing us to eliminate confounding parameters that affected the investment decisions of these firms during this period.

Exports form a significant portion of the Indian economy with exports of Goods and services constituting 20.5% of the GDP in 2005[2]. This is a growing sector and this figure is almost double what it was in 1995. The Textile industry itself is the third largest exporting sector among commodities contributing 15% of all the commodity exports by value in 2004[3]. While the sample is limited to firms in Tirupur and Chennai, this region

[1] Due to data limitations this paper stops with the financial year 2003-04 when the exemption was up to 30% of the export profits.
[2] Source: World Bank – India at a Glance (4/23/2007)
[3] Source: Economic Survey of India-2007,Ministry of Finance, Government of India

exported half of India's knit-wear garments[4] and one-fifth of all of India's ready-made garment exports. As a result, the finding of this paper is very relevant to a significant and important portion of the Indian economy.

The paper comes to the conclusion that the investment decisions of the firms were largely unaffected by the raising of tax rates. This has implications for the design of appropriate tax incentive policies by government.

Section II of this paper gives a background of the literature on the effect of tax rates and tax incentives on investment decisions. Section III describes the changes brought in by Finance Act, 2000 and how it was useful for the purpose of this study. Section III discusses the data being used and the randomization strategy. Section V analyzes the data and describes the results of the study. Section VI then estimates the investment response to changes in the tax rates. Section VII examines the evasion response of these firms and how that may confound the results with supporting evidence from field audits. Section VIII performs robustness checks on the data. Section IX discusses the policy implications and concludes.

II. The Effects of Tax Rates on Taxable Income and Tax Evasion in India

Hassett and Hubbard (2002) provide a very good review of the literature on the effectiveness of tax policy in general and tax incentives in particular in promoting investment and their general conclusions, briefly reviewed, are as follows:

- ⇨ Tax policy affects investment with an increase in tax rates by 1% decreasing investment to the tune of 0.5% to 1% (or an elasticity of -0.5 to -1.0). This

[4] Source: Apparel Export Promotion Council, Tirupur.Website http://www.aepcindia.com/portal/tirupur.asp

analysis uses micro data of Firms, There is, however, little evidence from macro-economic data that tax policy has any effect on investment however, these conclusion likely results due to significant measurement errors in macro-economic data, inter-asset reallocation of capital and simultaneity. These make it very difficult to draw any causal link or make correct attributions.

- ⇨ Taxes increase the user cost of capital so any uniform reduction in that user cost *should* encourage capital. Targeted incentives are unlikely however to achieve such broad based reduction in cost of capital.
- ⇨ Investment incentives are generally provided to investment in equipment and this creates inter-asset distortions between different types of capital. These distortions could outweigh the benefits from the award of such incentives.
- ⇨ Economic growth is higher in countries that invest more in equipment. This is primarily through the effect of workers learning better skills on operating different kinds of equipment. Hence subsidizing equipment is good for growth as it generates positive externalities.
- ⇨ Investment incentives do not work for many firms as they face financing constraints and cannot grow and take advantage of the tax incentives.
- ⇨ Because the supply of capital goods is inelastic in the short run, some investment incentives might be captured by suppliers of the capital goods and not benefit the investor at all.
- ⇨ Low inflation, which is a result of factors other than a policy decision to award incentives, works as a very good investment subsidy.

- ⇨ Temporary incentives can have larger short run impact than permanent incentives.

Desai, Foley and Hines (2006) examined the response of US multinationals to tax rates in the host countries on various investment decisions. They conclude that a US owned affiliates in countries with 10% higher indirect taxes had 7.1 % lower assets and those with a 10% higher corporate tax rate had 6.6% fewer assets. Similar effects were seen on output with the corresponding figures being 2.9% and 1.9% less respectively.

The literature however is dominated by studies on the response of firms in OECD countries. The study of the investment response of firms in developing countries is very limited. A meta study of Cross country analysis by Mooij and Enderveen indicate a high response of FDI to tax rates with a 1% drop in tax rate causing FDI to drop by 3.2%; Djankov et al. (?) comes out with a lower elasticity with a 10% drop in corporate tax rate contributing to a 2% drop in investment-to-GDP ratio.

One shortcoming of the literature has been the fact that cross-country studies do not capture all the impact of institutions in the country and tax changes are typically rolled together with other macroeconomic changes which makes it difficult to indicate causality. This paper seeks to address this shortcoming by trying to compare the investment response using a very similar group of firms with tax changes being the only difference among them. While this might increase the accuracy, drawing general conclusions becomes difficult.

III. The Natural Experiment - Finance Act, 2000

India taxes resident individuals on their world-wide income. Individuals are taxed at marginal rates while partnerships and Corporations are taxed at a flat rate. The tax rates for exporters (Firms and Corporations) during the period under consideration are given in Table-1. Tax benefits are given either as exemptions which do not enter into the calculations of Taxable Income or deductions, which reduces the income subject to tax.

In this paper I wish to exploit the change in tax law in India in the year 2000 that removed 100% exemption from income tax of profits from exports that was available since the year 1981. Exporting firms in India can be placed into two broad categories. Firms could apply for and be accorded a special dispensation from the Ministry of Commerce whereby they paid little or no indirect taxes on inputs that was used in production of goods that were exported. This group is hence forth referred to as Export Oriented Units or EOUs[5]. Other exporting firms paid their indirect taxes on inputs and got a refund from the Customs Department after export of the goods. The first group of exporters was located in an area designated as customs free zones. Both these groups of exporters were entitled to 100% income tax benefit on export income[6]. The Income Tax

Table- 1 : Applicable Tax Rates in India (1997 - 2004)

Financial Year	**Individuals***	**Firms****	**Corporations****

[5] These group of firms consisted of Export Processing Zone units that were physically located in an area designated as a customs free zone, or Export Oriented Units that were located elsewhere but had customs officials enforcing the customs free zone.

[6] The firms located in EPZs or EOUs enjoyed 100% exemption of export profit in calculating their taxable income tax under section 10A or 10B of the Income Tax Act. The second group of firms were granted a deduction of 100% of export income when calculating their taxable income under section 80HHC. As Partnerships and Corporations were taxed at a flat rate, the exemption and deduction were equivalent.

1997-98	Max – 30%	35%	35%
1998-99	Max – 30%	35%	35%
1999-00	Max – 30%	35%	35%
2000-01	Max – 30% +3.5% (> 380,000) (Surcharge 15%)	35%+(3.5%) (Surcharge 10%)	35%+(3.5%) (Surcharge 10%)
2001-02	Max – 30% +(<1%) (Surcharge 2%)	35%+(0.7%) (Surcharge 2%)	35%+(0.7%) (Surcharge 2%)
2002-03	Max – 30% +(~1%) (Surcharge 5%)	35%+(1.75%) (Surcharge 5%)	35%+(1.75%) (Surcharge 5%)
2003-04	Max – 30% +(~2.5%) (Surcharge 10%)	35%+(0.9%) (Surcharge 2.5%)	35%+(0.9%) (Surcharge 2.5%)

* Taxed at Marginal Rates, Maximum Marginal Rates of 30% applicable at rupees 150,000 and above,

** Flat Rate

benefits enjoyed by these two group of firms were similar with the exception that the with respect to the EOUs there was a commitment that the tax benefits would be available for 10 years from the date of commencement of production. After the completion of the 10 years, these exporters were considered as ordinary exporters with regard to income tax benefits.

On the 29th of February, 2000 the Finance Minister of India announced the Finance Bill, 2000 that in a surprise move introduced major changes to the tax benefits enjoyed by the exporters. While 100% income tax benefits for most exporters were curtailed, the EOUs continued to enjoy the benefits for the remaining part of the 10 years that was committed to them. The Finance Act also did not allow any income tax benefits to new EOUs. This ensured that the non-EOUs did not have any incentive to change their

status. Table –2 gives a brief description of the tax benefits and the major changes to these laws during the period under consideration.

In order to take care of issues of selection, the element of surprise in the changing of the tax law is important as firms could adjust their behavior in anticipation of the tax change and bias the results. The surprise in the case of the change in the tax benefits to exporters needs to be justified. The Finance Minister announces the budget every year on the last week of February. The budget exercise involves Revenue and expenditure changes and is extremely secretive exercise. It is hard to justify as to why there is this utmost secrecy associated with the budget. One possible reason is to allow the government to deliberate how revenue is to be raised and how it is to be spent without outside pressure.

Table – 2 : Changes in Indian Income Tax Laws applicable to Exports 1997-2005

	Section 80HHC	**Section 10A/10B**
Pre-1997	• Export of Eligible Goods/Merchandise (Does not include Unprocessed Ores or minerals) • Deduction available only when return is accompanied with an auditor's report • 100% deduction when computing taxable Income of Profits applicable to exports • 90% deduction of export incentives (mainly return of Indian taxes paid on inputs) granted by government	• Any Profits and Gains from exports derived from an undertaking set up in an Export Processing Zone or Export Oriented Unit • 100% Exemption from taxable income available for ten consecutive years • Exemption available only when return is accompanied with an auditor's report 10A • Profits exempt from MAT
1997-98	80HHC deduction exempt from MAT (for Corporations; 10A, 10B corporations were always exempt from MAT)	
1998-99		
1999-00		

2000-01	Deduction limited to 80% of export Profits, Entire tax benefit to be phased out by 2004-05	Exemption limited to units set up before 1-Apr, 2000
2001-02	Deduction limited to 70% of export Profits	
2002-03	Deduction limited to 50% of export Profits	Exemption limited to 90% of the export profits, Exemption to be wound up by 2010
2003-04	Deduction limited to 30% of export Profits	
2004-05	No Deduction allowed for export Profits	

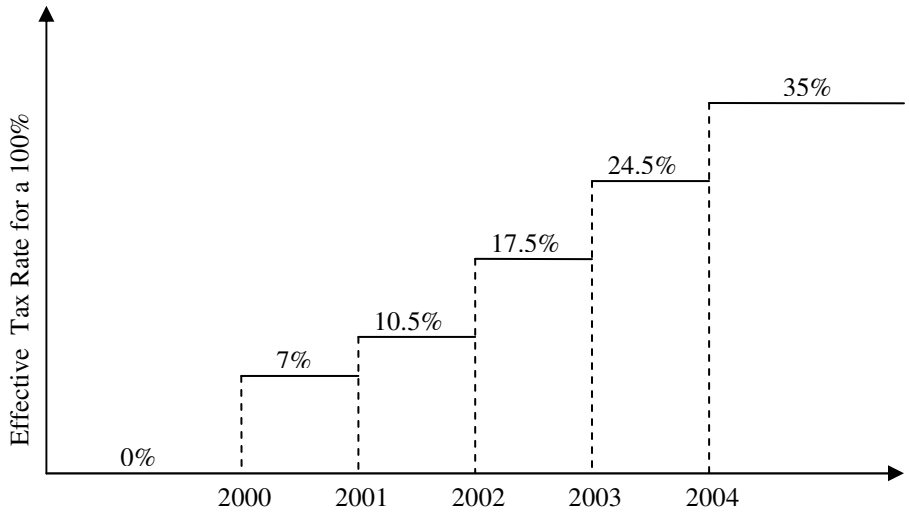


Figure – 1: Policy change for exporters 2000-2005

The Revenue proposals are kept so secret that the internet connection to the Ministry of Finance is cutoff for two months and key officials involved in the budget exercise are trailed by Intelligence officials. This secrecy has been found to be essential in the case of India because a very significant amount of revenue is raised from indirect taxes at the manufacturing stage and covers almost all manufactured goods. Hence expected rise in tax rates for certain goods especially essential goods could induce hoarding by traders and manufacturers resulting in spiraling prices that hurt the poor. FA2000 changed benefits of non-EOUs while keeping those of EOUs unchanged. Had non-EOUs anticipated this change they would have converted their units into EOUs and

prolong their tax benefits. This would have shown up as a spike in the number of EOUs prior to the reform or a spike in the Sales of EOUs. On the other hand, Figure-2 below indicates that the export performance of the EOUs remained unaffected prior to the tax changes or even subsequently though total exports from India went up. This indicated that there was no significant movement into the control group in anticipation of the tax change.

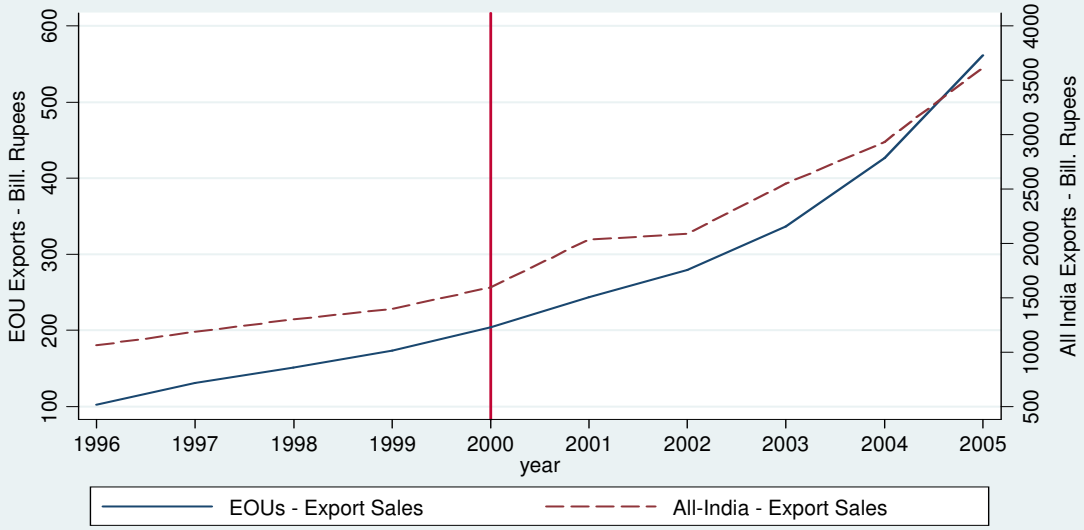


Figure-2: Export Sales from EOUs 1998-2004

The motivation for the change in tax benefits to exporters has primarily been external; the result of the new WTO guidelines that said that export subsidies were incompatible with free trade and Indian exporters were time and again subject to countervailing duties by importing countries because of this. Further as there was no spike in evasion before the tax reform as shown by a sharp drop in Tax-GDP ratio and Income tax collections (Figure-3), it precludes the problem of endogeneity. One could conclude that the tax reform of FA2000 was not induced primarily by low tax compliance.

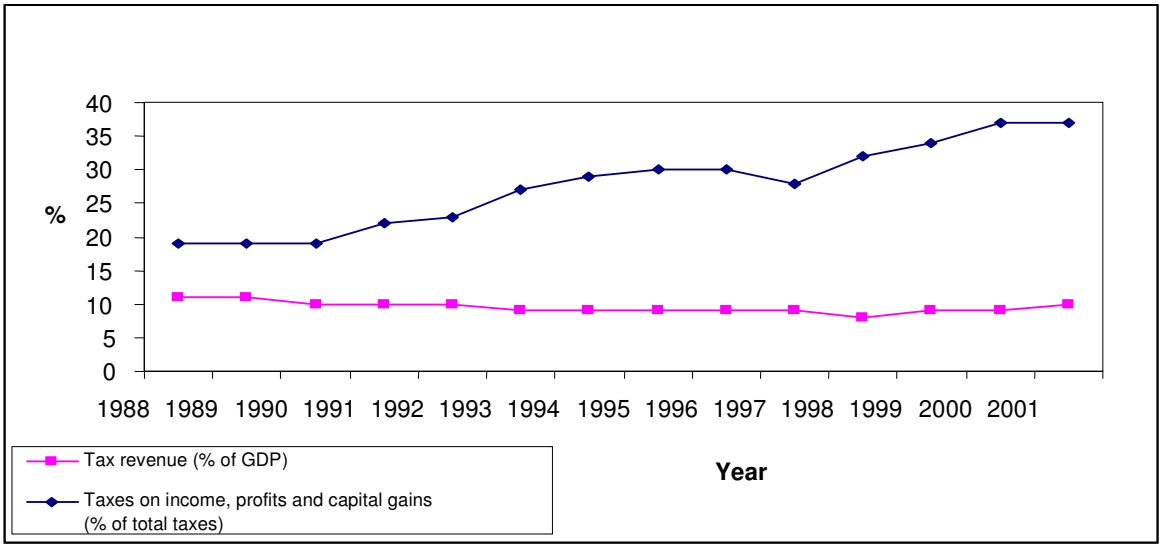


Figure – 3: Tax Revenues (%) 1988-2001

The EOUs and non-EOUs are very similar in many respects and this includes their ability to respond to tax changes. This is because the two classes of taxpayers face very similar economic situations and also faced similar tax benefits (100%) prior to the tax reform. The accounting practices and reporting practices of the two groups of exporters are similar. They face the same level of scrutiny by the tax department and hence their evasion decisions should not be very different. As a result the selection of taxpayers between the control and treatment groups are unrelated to their decision to evade taxes or their responsiveness to taxes. It is not surprising that there are firms that own both EOUs and non-EOUs. The limited number of these firms precludes a detailed study of the tax practices of this very interesting group of taxpayers.

However, while the two classes of taxpayers are very similar in many respects the EOUs exporters have to satisfy minimum export requirements. EOUs interaction with the

custom authorities is more streamlined than those outside the customs-free zone[7]. Hence EOUs in general have lesser problems with importing machinery needed for production. EOUs also have to commit to achieving a minimum level of exports and hence those who intend to set up units primarily for local sales would not be inclined to be classified as an EOU. This does not happen to be an issue with this study because the export as a percentage of the total Sales of the two groups is very close to each other (about 90%).

In terms of business practice, exporters are quite representative of other taxpayers. They are part of the same social milieu and hence should have similar compliance norms as the non-exporters. They are advised by the same tax accountants and scrutinized by the tax department in the same manner as non-exporters. Many exporters are owned by persons who were previously in business that did not involve exporting[8]. Hence the compliance norms of exporters are likely to be very similar to non-exporters.

IV. Description of the Data

The data consists of a seven year panel of 88 firms from the southern Indian state of Tamil Nadu. The biggest constraint in conducting this study has been the lack of a readily available data-set from the Tax department. It was only in 2002 that the tax department of India started using computers to process tax returns and that too in the major cities. Hence the data set on which this study is based has been collected manually and as a result, the only source of information remains the tax department and the

[7] Some auditors suggested that close interaction with customs authorities was more of a hassle than an advantage.

[8] The best justification for this is to get a sample of exporters and non exporters in a non-tax situation and show that they are indistinguishable in terms of many economic parameters. This was not possible as it was only in the financial year 2004-05 that exporters are being treated the same as non-exporters for income tax purposes and all efforts to extend the dataset beyond 2004 proved futile.

taxpayers themselves. As Tax returns constitute private information, preparing a micro-data set on Indian taxes is extremely difficult for those outside the tax department.

Table : 3 – Summary Statistics

Variable	Control Group	Treatment Group
Total Sales	237.03 (mill.) (453.22)	138.13 (mill.) (316.87)
Export Sales	222.49 (mill.) (443.77)	109.72 (230.60)
Export Intensity (Export as % of Sales)	94.28 % (12.85)	88.07 % (24.12)
Net Profit	25.20 (65.39)	12.12 (30.62)
Net Profit – before tax (% of Sales)	4.23 % (14.89)	10.49 % (11.83)
Taxable Income	2.38 (mill.) (11.93)	7.30 (mill.) (49.10)
Sole Proprietorships*	0	62
Partnerships*	10	292
Corporations*	81	98
Location – Tirupur*[@]	18	385
Location – Chennai*	63	73

* Firm-year data points, [@] Includes Export units in the vicinity, Standard error in brackets

This has probably been the main reason why micro-studies using Indian tax data have been rare. The author has the advantage of being a part of the tax department and hence was allowed to access the tax records. However, the state of the tax records especially of the older records has been so poor, that it was not possible to construct a credible random sample from the Tirupur tax office. As a result, the author took the help of private tax auditors from the city of Tirupur. The use of auditors in order to collect a random sample works very well here because all exporters have to submit an audit report certified by a

tax auditor in order to avail of the deduction for export income. Hence any randomization strategy covering all tax auditors from the district of Tirupur would in effect randomize over all exporters in that district. A randomly selected set of auditors were given a data-sheet and provided with a randomization strategy and asked to fill-up the data of their clients. In order to protect the identity of their clients, the data was provided by the tax auditors in an anonymous form[9].

Out of the 64 auditors in Tirupur having exporting firms as clients, sixteen auditors were randomly selected, fourteen responded with the data. In this paper, the author has not analyzed the effect of this non-compliance of two auditors which requires an additional amount of data collection from the tax department which could not be possible. However the tax behavior of these two out of sixteen auditors is not likely to have a systematic effect on the results. The second issue was to conduct a nation-wide study, but this is extremely difficult because tax returns are filed at the local tax offices and hence a national study would involve traveling to more than 200 tax offices. Hence this present study limited to two large centers in the southern Indian state of Tamil Nadu while being a small step is actually the first effort to understand the impact of taxes on taxpayer behavior using micro-data in India.

In order to get a biggest return, the data has been collected from the two largest centers of exporters in Tamil Nadu, Tirupur and from the State Capital, Chennai. Tirupur exported Ready-made Garments worth 47.26 billion rupees ($1 billion)[10] in 2004 which constituted about a 9% of exports from the whole of India. Tamil Nadu as a whole made

[9] The help provided by the tax auditors to the author was excellent and without their help this survey could not have been prepared.
[10] Tirupur exporters Association website http://www.tea-india.org/garment-manufacturers-exporters-statistics-go.asp (accessed on 18-Aug-2005)

up about 25% of India's Textile exports in 2003[11] which includes Ready-Made Garments and Cloth. Hence this while this data-set limits itself to the state of Tamil Nadu, this constitutes a significant part of the exporting community of India[12]. Figure-4 compares the exports of Ready-made garments of the sample with that for the whole of India.

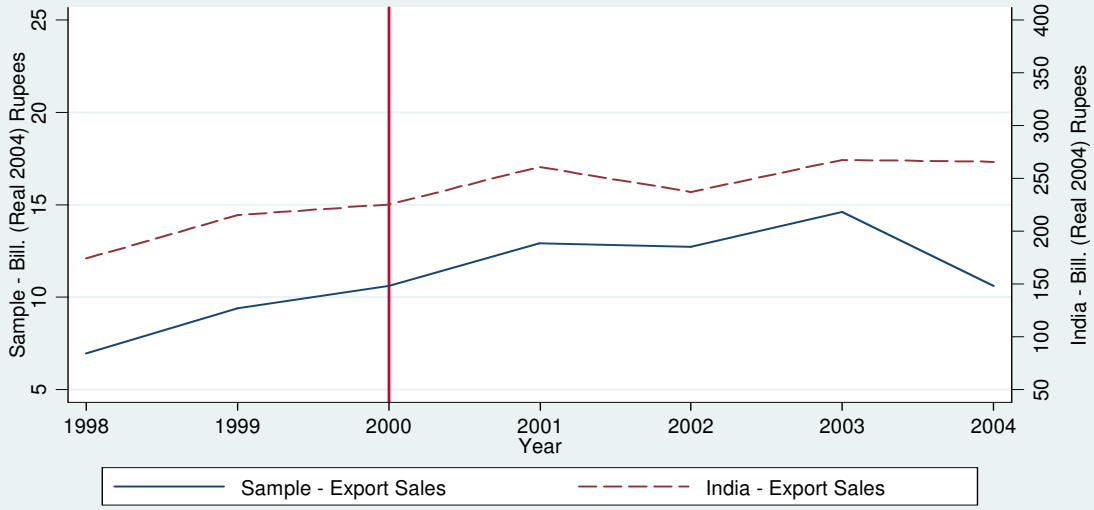


Figure-4: Ready-Made Garments Export Sales 1998-2004

The Sample constitutes about 5% of the total Export Sales of the whole of India and the trends in the sales are very similar except for the fact that in 2004 the export sales for sample declines more sharply than for that of all India exports.

Table-3 shows the summary statistics for the two groups of exporters. The average Treatment group firm is smaller than the average firm of the Control group in terms of sales, though both export similar percentage of their sales. However, there are large sized firms in the Treatment group and in fact the largest firm belongs to the Treatment Group. Further to obviate this difference having any confounding effect on the

[11] Calculation by author based on data from Tamil Nadu Industrial Policy, http://www.tn.gov.in/misc/ind_policy2003.htm (accessed on 18-Aug-2005)
[12] Units owned by the government itself contributed to 17% of the total exports from India in 2003.

analysis, robustness checks have been done by restricting the sample to similar sized Treatment and Control group firms. The other difference in the groups is the difference in locations. The sample that is being used for the purpose of this study consists of non-EOU exporters primarily from Tirupur while the Control group firms who are EOUs are primarily from Chennai. This is because the Export Processing Zone is located in Chennai.

The total number of active exporters recorded with the Tirupur Exporters Association is about 200 out of which the data set consists of 60 exporters which contributed about one-eight of the total exports from Tirupur. The Control group consists of the 18 out of the 23 textile exporting EOUs based in Tamil Nadu that claimed exemption during the period under study. 80% of all these EOUs are corporations and hence it is not surprising to see most of the control group consisting of corporations. As the EOUs are primarily located in the Export Processing Zone in Chennai, a random sample of 10 corporations was selected from one Tax Office in Chennai and included in the dataset to provide a check that the results were not specific to the location of Chennai or Tirupur.

The data consists of the main parameters from the profit and loss account, balance sheet and tax return of the firms for the years 1997 to 2004. The data from the tax return such as taxable income and tax paid is also recorded. If an exporter owns two firms, one of which is an EOU and the other a non-EOU or a local business, separate accounts have to be maintained by law for the EOU to be eligible for the benefit. In the data-set there are 6 such firms. In these cases the data for these units are recorded separately under the treatment and control groups though they file a joint tax return. Export deductions can be

claimed only when the tax return is accompanied by a private auditor's report that verifies that goods were exported.

A very important difference between the Treatment and Control group are the ages of the two groups. As mentioned before, as the Income Tax Law provides for 10 year exemption from Income Tax for EOUs from the date of start of production under section 10A, these firms are relatively young firms. As a result it is likely that any results measured across the time of the tax change could just be picking up natural trends in improving profitability over time of the firms. This confounding possibility is taken care of by including the age and the square of the age of the firm in all the regressions.

V. Analysis of the Data

The FA2000 changed the tax benefits for the treatment group by reducing their deduction from 100% of export income to 80% of export income in the first year translating to an increase their effective tax rate from 0% to 7.7%[13]. Over the period under study, the effective tax rate averaged 17.8%. The control group continued to enjoy an effective tax rate of 0% on their export income.

I measure the overall response of taxpayers to the tax change primarily by measuring how the investment in fixed assets changed as a response to the tax change. I also measure the other parameters such as gross-profit, sales, exports and depreciation, to see how these individual components changed as a result of the tax.

[13] The change in effective tax rate from 0% to 7.7% is for a 100% export oriented unit which was liable to pay tax on 20% of the export income earned in financial year 2000-01, when the tax rate was 38.5%.

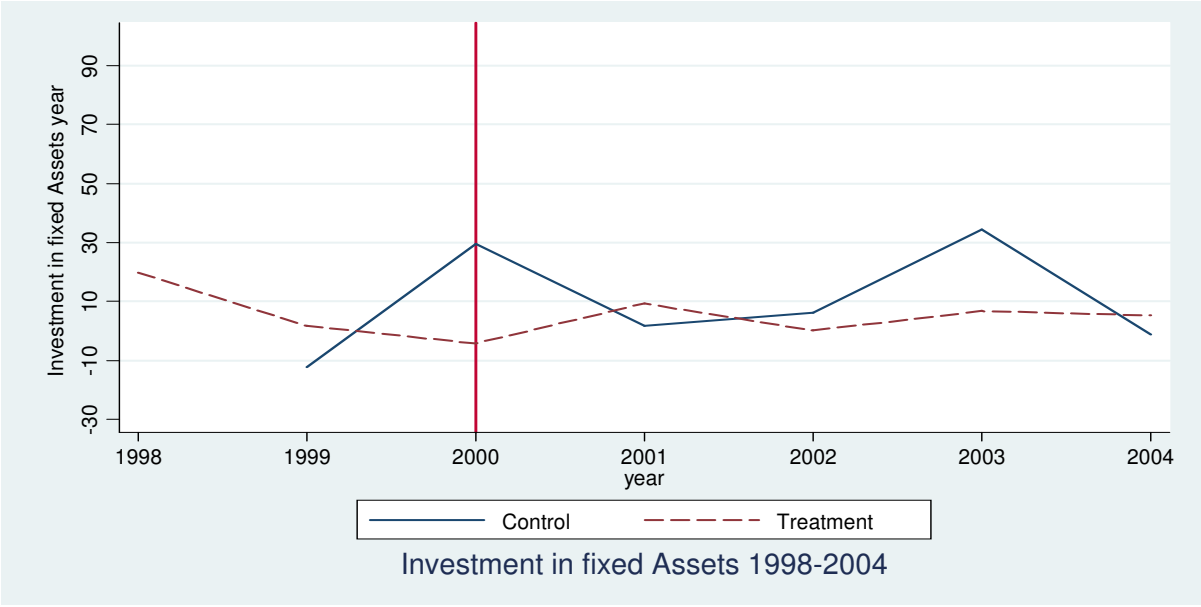
Table 4 : Average Tax Rates Post Reform				
Year	**Average Export Intensity**	**Export Benefit**	**Tax Rate**	**Effective Tax Rate**
2001	88%	80%	38%	11.25%
2002	87%	70%	35%	13.69%
2003	88%	50%	36%	20.16%
2004	89%	30%	36%	26.02%
			Average for the Period	17.78%

The analysis is based on the difference-in-difference method with the averages of three years before the reform (1998 to 2000) and four years after (2001 to 2004). This gives us the overall effect of the tax reform. As the tax benefits were removed gradually, the measurement could be based either by comparing the average of the pre-reform parameters with each year after the tax reform or using the post-reform average. The post reform average method has been chosen because FA2000 announced (the higher) effective tax rates for the period 2001 to 2005. Hence the response in the year 2001 could not be treated as an isolated response to the rise in tax rates relevant only for that year. As data is available only up to the year 2004, the effective tax rate is being taken as the average during the post reform period until 2004 which is 17.78% (Table 4) [14]. The other advantage of using the entire post-reform average is that the power of the tests goes up which is very necessary considering the data limitations.

[14] As the tax rates are different for individuals, I have used a weighted tax rate of (34.5*36 +38.5*228) /(228+36) = 38% for all the years.

The main response being measured to the tax change is the Investment in Fixed assets. This ratio places equal weight on all tax payers as the primary goal of this paper is to measure the response of the taxpayers regardless of size. The analysis of the response using the diff-in-diff method assumes that the treatment and control group are similar in most respects and show similar trends in similar situations prior to the tax reform. This is true for the years of 1998 – 2000 in most cases. In the figure below, the investment response is shown.

Investment Response: The investment from year-to-year is plotted for the treatment as well as the control group. Unsurprisingly, there is no overall response of the investment control group during the time of the tax changes as this group was unaffected directly with the tax changes. However, what is surprising is that even the year-to-year investment by treatment group which saw its tax rates rise to an average of 18% post reform does not show any response.



Investment in fixed Assets 1998-2004

The Table below shows the regression of the investment in fixed assets before and after the reform. The impact of the reform on the treatment group as compared to that of the control group is captured by the TREAT X POST variable. This variable is not statistically significant indicating no impact of the tax changes on the investment. Surprisingly even the sign is wrong. However, the variables that are significant behave the way one expects. The statistical significance of the No of Year variables suggests that the investment in fixed assets peaks rises as the firm grows older and then drops off. Similarly corporations also invest higher amounts in fixed assets.

	(1)	(2)
VARIABLES	**Base Case**	**Investment in Fixed Assets**
TREAT x POST	2.092	1.210
	[19.49]	[22.90]
Treat	-7.658	13.95
	[18.64]	[20.82]
Post	2.966	-5.458
	[18.07]	[25.09]
No of Year		-0.806*
		[0.413]
No of Year ^2		0.0251**
		[0.0114]
Total Export Turnover		-0.0302
		[0.0710]
Post X Export		0.109
		[0.126]
Chennai		-10.26
		[8.885]
Corporation		18.76*
		[10.21]
Constant	7.915	-8.180
	[18.12]	[21.81]
Observations	454	301
R-squared	0.007	0.123

Robust standard errors in brackets
***** p<0.01, ** p<0.05, * p<0.1**

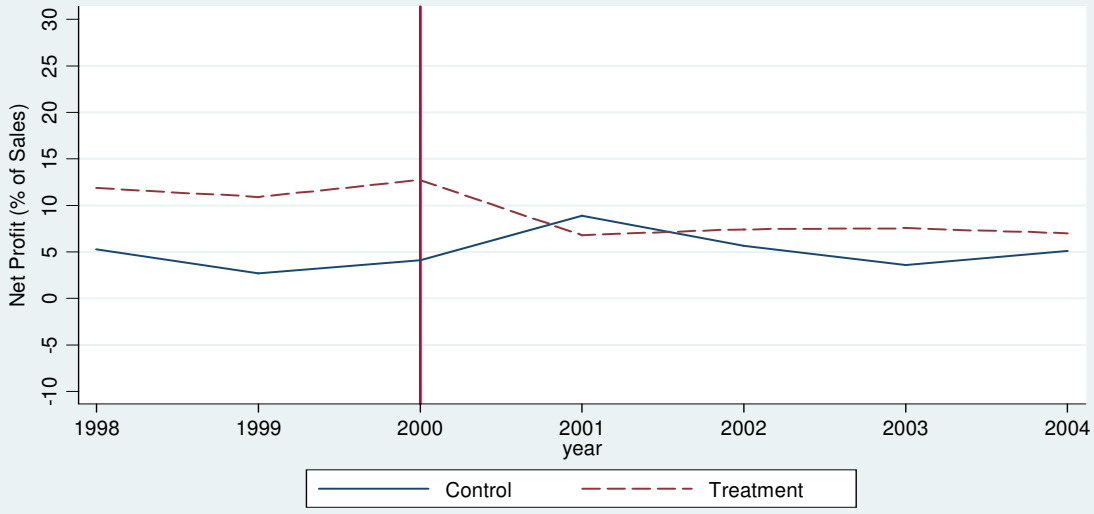


Figure-5: Net Profit (% of Sales) 1998-2004

Net Profit Response: The response of the net-profit of the exporters to the tax reform is shown in Figure-5. It is clear that there is a downward movement on the net profit as a percentage of taxable income immediately after the year 2000 for the treatment group. The net profit percent of Control Group on the other hand rises after the year 2000 and stabilizes after that without showing any fall in level overall as compared to the pre-reform period. This rise post 2000 coinciding with a simultaneous fall for the treatment group points to some kind of interaction between the treatment and control group. It is possible that some of the profits are diverted from the treatment group to the control group. This is corroborated by the fact that when the taxpayers who have units that belong both to the treatment and the control group are removed from the sample the response in the year immediately after the reform does not appear to interact in this manner. The response in the form of diff-in-diff estimates for the entire period is shown in the first column of Table-5. Columns (1) and (2) give the average estimate for the four years after reform. Column 2 of Table-5 shows that even after controlling for other

variables and interacted with the period of reform, we continue to get the same high level of significance. Firms responded to the tax increase by showing a lower net profit (%) on the average of about 10% with respect to the Control group. The pre-reform average for the Treatment group is about 12% which falls to an average of about 7% post reform.

TABLE: 5 - Net Profit (%) Response

	(1)	(2)	(3)	(4)	(5)
	Base Case	Net Profit %	Net Profit %	Net Profit %	Net Profit % (Firm-Fixed Effect)
Treat X Post	-9.353	-10.627			
	[2.779]***	[2.125]***			
Treatment	11.147	11.334	11.426	12.575	0
	[3.173]***	[2.421]***	[3.717]***	[4.160]***	[0.000]
Post	4.736	3.424			
	[2.617]*	[1.753]*			
Year of Business		-0.722		-0.744	-1.745
		[0.353]**		[0.351]**	[3.096]
Year of Business^2		0.017		0.018	0.024
		[0.008]*		[0.007]**	[0.016]
Assets		-0.042		-0.001	-0.07
		[0.024]*		[0.069]	[0.088]
Post X Assets		0.018			
		[0.016]			
Export Sales		0.006		0.02	0.042
		[0.009]		[0.024]	[0.041]
Post X Export Sales		0.01			
		[0.007]			
Chennai		-16.999		-19.398	0
		[2.837]***		[2.489]***	[0.000]
Corporation		7.337		9.641	0
		[3.564]**		[3.768]**	[0.000]
Treat X 1999			-1.239	-1.379	-4.616
			[3.485]	[5.639]	[4.781]
Treat X 2000			0.375	0.396	-0.976
			[4.754]	[6.935]	[7.094]
Treat X 2001			-12.926	-18.535	-21.239
			[3.967]***	[6.644]***	[6.942]***
Treat X 2002			-8.059	-7.718	-11.521
			[4.251]*	[5.327]	[5.946]*
Treat X 2003			-8.211	-9.706	-16.229
			[5.037]	[6.309]	[5.623]***
Treat X 2004			-9.542	-11.402	-19.319

			[7.055]	[8.045]	[6.734]***
Total Turnover				-0.018	0.067
				[0.018]	[0.046]
Year Dummies			Yes	Yes	Yes
Assets, Export X Yr.			Yes	Yes	Yes
Constant	0.718	8.871	0.634	7.593	6.282
	[3.030]	[3.707]**	[3.560]	[5.412]	[30.932]
Observations	528	272	528	272	272
R-squared	0.07	0.28	0.08	0.31	0.27

1) Robust std errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%
2) Clustered Standard Errors for all Regressions

On the other hand this should have actually been 17% if the treatment group had followed the same trend as the Control group. The response for each year of the reform is given in columns (3), (4) and with firm-level fixed effects in column (5). It can be seen that the biggest response is in the year in immediately after the reform. This is a surprising finding considering the fact that firms were informed at the last day of February, 2000 about the tax change to begin with effect from April 1st one month later. The response in the form of a more than 50% drop in profitability in the very first year of the tax change due to a small increase in their tax liability from 0% to an effective rate of 7% is large by any standards.

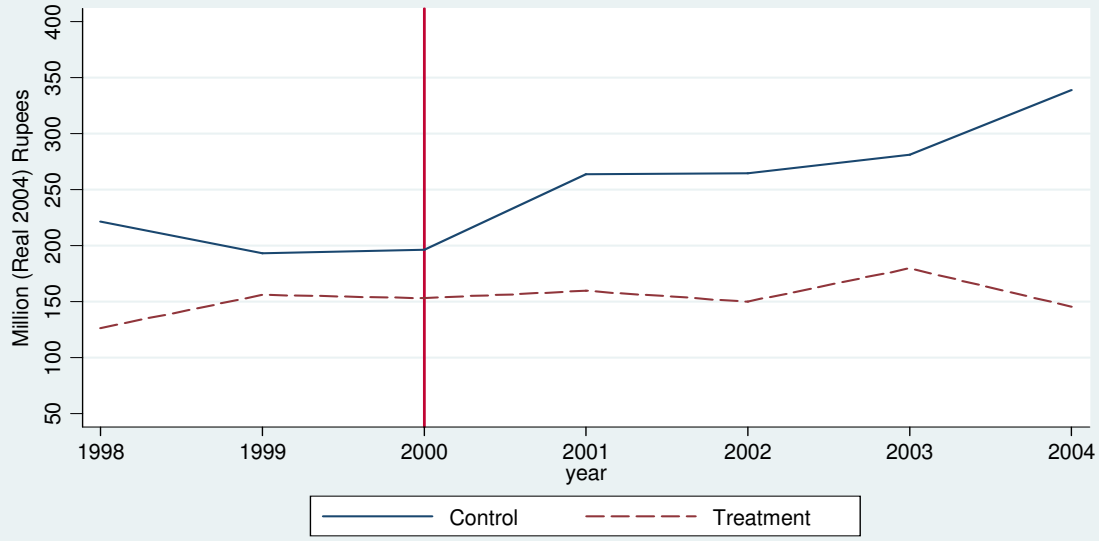


Figure-6: Sales 1998-2004

Sales Response: I then analyze what components of the Net-Profits can explain caused such a fall in profitability in such a short time. Net Profit is computed by deducting business expenses which includes depreciation and office expenses from the Gross-Profits. Gross Profits as mentioned earlier is obtained by deducting expenses associated with production such as wages and cost of raw material from Sales. A lower Net-Profit as a percentage of Sales could result from loss of profitable export Sales, or a rise in cost of production

TABLE-6: Sales Response

	(1)	(2)	(3)	(4)	(5)
	Base Case	Total Sales	Total Sales	Total Sales	Total Sales
Treat X Post	-70.642	-32.839			
	[106.631]	[16.341]*			
Treatment	-55.974	55.041	-95.238	81.888	0
	[95.713]	[19.437]***	[114.911]	[38.666]**	[0.000]
Post	83.9	36.563			
	[103.918]	[17.775]**			
Year of Business		-2.943		-2.349	-14.166
		[2.005]		[1.432]	[15.918]
Year of Business^2		0.114		0.075	0.004
		[0.093]		[0.051]	[0.026]
Assets		1.446		2.005	-0.032
		[0.303]***		[0.546]***	[0.156]
Post X Assets		-0.772			
		[0.291]**			
Export Sales		1.078		0.738	0.953
		[0.109]***		[0.275]**	[0.059]***
Post X Export Sales		-0.016			
		[0.130]			
Chennai		-103.692		-60.881	0
		[91.269]		[45.211]	[0.000]
Corporation		107.647		59.334	0
		[92.985]		[45.781]	[0.000]
Treat X 1999			58.011	-21.746	-2.308
			[53.160]	[40.938]	[6.410]
Treat X 2000			52.275	-30.936	-18.63
			[61.220]	[41.524]	[9.121]**
Treat X 2001			-9.058	-56.634	-14.796
			[111.160]	[40.811]	[10.001]
Treat X 2002			-19.566	-56.043	-14.489

			[112.344]	[41.977]	[10.063]
Treat X 2003			-6.339	-66.416	-12.834
			[108.722]	[44.028]	[12.670]
Treat X 2004			-98.643	-70.197	-1.908
			[139.737]	[40.046]*	[7.876]
Constant	202.067	-52.431	221.57	-62.525	169.158
	[81.575]**	[21.950]**	[99.920]**	[32.640]*	[133.272]
Observations	549	276	549	276	276
R-squared	0.01	0.98	0.01	0.99	0.99

1) Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%
2) Sales in Million (Real 2004) rupees

reflected in lower Gross Profits, or higher depreciation deductions or rise on other expenses. Each of these components could be checked as the data is available in the tax returns. If firms lower their Sales in response to the lower after-tax return, then this should reflect in Gross-Profits and subsequently the Net-Profits could be adversely affected due to lower revenue in the face of fixed costs in the machinery.

The response is shown in Figure-6. There is no discernible change in the Sales before and after the reform. The Sales of the Treatment Group is rising but with no discernible change in trends in the year 2001 or later except for the year 2004 when it appears to diverge significantly from the Control group. The sales of the Control group firms on the other hand are rising much faster than that of the Treatment group. The first column of Table-6 shows the diff-in-diff estimate of the response. The interaction term for the period after the reform or the year following the reform is insignificant for four of the five specifications including when controlling for firm fixed-effects.

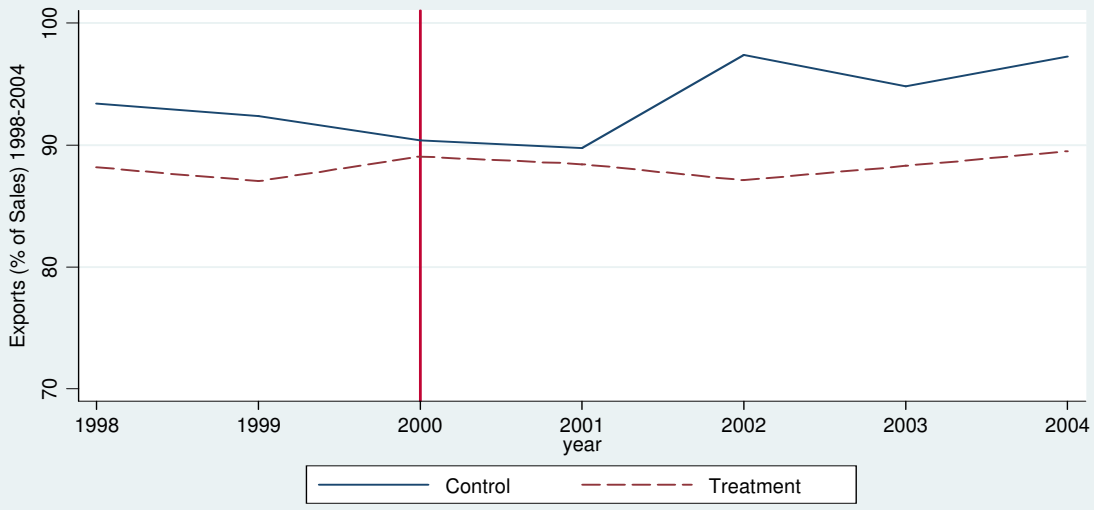


Figure-7: Exports as % of Sales 1998-2004

If Firms have not changed the total production, they could on the margin respond to a lower after tax return on export profits by lowering the amount they export and increase their sales in the local market. This response is shown in Figure-7. Export intensity (export Sales as a percent of total Sales) is flat shows no discernible change before and after the reform for the treatment group and has in general been averaging at 90% of total sales. However it appears that after 2001, the control group has a different trend with respect to the treatment group.

TABLE-7: Export (as % of Sales) Response

	(1)	(2)	(3)
	Base Case	Export Intensity	Export Intensity
Treat X Post	-1.656	-2.668	
	[2.884]	[4.215]	
Treatment	-5.05	-8.389	-6.166
	[3.714]	[6.264]	[4.006]
Post	2.079	1.325	
	[2.090]	[2.757]	
Year of Business		-0.369	
		[0.856]	
Year of Business^2		0.007	
		[0.017]	
Assets		-0.049	
		[0.021]**	
Post X Assets		0.002	
		[0.005]	

Chennai		-4.825	
		[4.969]	
Corporation		-7.779	
		[9.744]	
Treat X 1999			-1.789
			[2.986]
Treat X 2000			3.973
			[3.458]
Treat X 2001			2.67
			[7.074]
Treat X 2002			-2.321
			[3.711]
Treat X 2003			-0.715
			[3.527]
Treat X 2004			-1.599
			[3.969]
Year Dummies			…
Constant	92.869	106.602	94.663
	[2.244]***	[9.375]***	[2.008]***
Observations	542	272	542
R-squared	0.01	0.21	0.01

Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

Table-7 is the diff-in-diff calculation of the average response of the export intensity to the reform after controlling for various factors. The coefficient of the interaction term is insignificant but negative in sign. One could conclude that the change in tax rates had little or no impact on the composition of exports.

On the basis of the above analysis one could conclude that that firms did not change the way they did business after their tax benefits were reduced. Neither did they change their Sales significantly, nor did they change the percentage of their Sales they exported. They also did not vary the composition of their export to local sales. This is a surprising conclusion as one would expect that there would be some kind of response for a rise in effective tax rate of 18% for the entire period throughout the reform.

However it might be argued that firms could legally contract out their sales to the firms of the Control group and share the tax benefits. However such contracted sales would be reflected as exports of only one of the groups, but not both. It is possible to

verify if such a possibility has happened. Such contracted sales would show up as higher sales both for the Treatment and Control group. Second, this would show up as lower export as a percentage of sales for the Treatment group and higher for the control group and these two groups should diverge after reform. It is difficult to hide export sales as these are reported by the customs authorities belonging to the same tax department. Both these possibilities can be precluded from the above analysis.

If Sales and Exports have not changed, the lower net-profits could be the result of higher cost of production. Such a possibility should be reflected in lower gross-profits as a percentage of sales. Figure-8 shows the gross profits as a percentage of Sales during this period. In general the trends are similar before and after the reform. Table-8 shows the diff-in-diff estimates of the response. The interaction term is insignificant though the coefficient has a negative sign. This persists even after controlling for other variables and their changes during the period of the reform. The results indicate that the response in net profits was not through higher costs of production in any significant way.

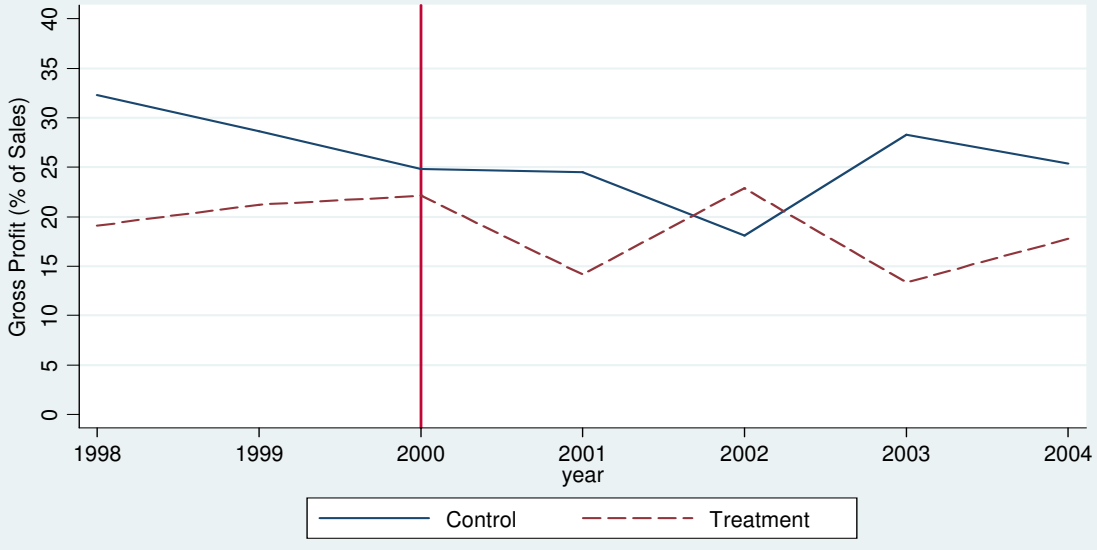


Figure-8: Gross Profit (% of Sales) 1998-2004

Hence it can be concluded the drop in net profits by 10% was entirely due to factors other than the cost of production as the net profit is computed from the gross profit after subtracting incidental expenses to the business from the gross profit. The analysis reveals that the entire response to the tax reform has been through such incidental expenses and depreciation. Figure-8 shows that there are no discernible differential trends between the Treatment and Control Groups due to the reform.

The response in the form of lower net profit percentage needs to be explained because the gross profits are unaffected. It could be because taxpayers are changing the way they do business. This could be in the form of changing their Sales, changing their mix of export vs. local sales, investing in machinery to claim higher depreciation which is deductible as an expense, and so on.

TABLE-8: Gross Profit (% of Sales) Response

	(1)	(2)
	Base Case	Gross Profit (%)
Treat X Post	-2.064	-8.229
	[6.072]	[8.551]
Treatment	-7.039	-0.633
	[7.007]	[6.396]
Post	-1.723	-2.082
	[5.476]	[9.119]
Year of Business		0.138
		[0.525]
Year of Business^2		0.004
		[0.012]
Assets		-0.045
		[0.044]
Post X Assets		-0.003
		[0.034]
Export Sales		-0.029
		[0.023]
Post X Export Sales		0.023
		[0.019]
Depreciation		0.592
		[0.418]
Post X Depreciation		-0.341
		[0.342]

Chennai		-1.657
		[10.480]
Corporation		3.042
		[11.111]
Constant	27.728	23.712
	[6.872]***	[6.433]***
Observations	467	176
R-squared	0.01	0.19

Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

Firms could reduce their net profit in other ways even without changing their Sales and export intensity. They could invest in plant & machinery that allows them to claim depreciation that is deductible and reduce their net profit. Hence it would be beneficial to firms who outsource their work to invest in plant and machinery and do the work in-house. This lowers their tax liability even while not changing the Sales significantly. In the case of corporations there could be another kind of depreciation response. The depreciation for tax purposes is in general higher than that for the purpose of corporation accounts (book depreciation). Firms could then choose to invest in items that give higher tax depreciation than book depreciation[15]. The latter does not affect the bottom lines for the purpose of published accounts even while lowering the tax liability.

[15] There has been anecdotal evidence of taxpayers investing in windmills that provided for 100% depreciation. This was also corroborated by the Tax Officer in charge of Tirupur during the time, Mr. V.S.Kumar

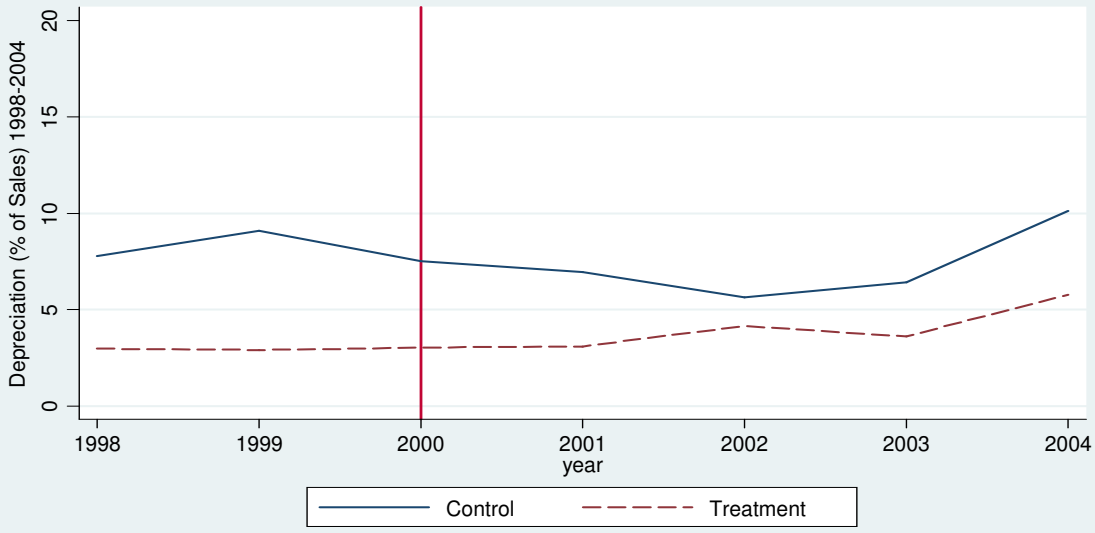


Figure-9: Depreciation (% of Sales) 1998-2004

From Figure-9 it is clear that there is a small upward movement in the depreciation of after 2001 for the treatment group and post 2002 for the control group. The results of the regression are shown in Table-9. The interaction term is significant only in the base case. Firms appear to move towards investing in plant and machinery that led to higher depreciation claims but this response is not significant when adding controls. The third column is the difference-in-difference analysis of the difference between the tax depreciation and book depreciation. The interaction term is insignificant though of the positive sign. Hence there has not been any preferential investment in tax favored machinery though there has been an increase in investment in general.

Table-9: Depreciation (% of Sales)

	(1)	(2)	(3)
	Base Case	Depreciation (% of Sales)	Tax – Book Depreciation
Treat X Post	6.315	2.402	2.554
	[3.607]*	[3.459]	[1.647]
Treatment	-10.854	-8.654	0.368
	[4.066]***	[3.306]**	[1.823]
Post	-5.179	-2.646	-3.173
	[3.555]	[3.771]	[1.687]*
Year of Business		-0.077	-0.21

		[0.201]	[0.163]
Year of Business^2		0	0.003
		[0.004]	[0.004]
Assets		0.073	0.045
		[0.025]***	[0.021]**
Post X Assets		-0.042	0.052
		[0.019]**	[0.019]***
Export Sales		-0.027	-0.021
		[0.010]***	[0.008]**
Post X Export Sales		0.014	0.005
		[0.009]	[0.008]
Chennai		7.298	2.531
		[3.082]**	[3.552]
Corporation		-9.417	-1.551
		[3.827]**	[3.928]
Constant	13.797	14.221	2.199
	[4.043]***	[3.546]***	[1.437]
Observations	507	243	241
R-squared	0.11	0.19	0.85

Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

The mix of the kind of taxpayers being tested introduces other complications that do not arise in the case of individuals. A rise in tax rates for owners of Firms would in the normal case force them to seek ways of taking out their profits with lower tax liability. If for example the tax rates for individuals are lower than that of the Corporations or Partnerships, then owners of firms can give themselves tax deductible compensation that is taxed at a lower marginal rate. This is not an issue with this tax reform for two reasons. First, because the maximum deductible compensation for directors of the firms and partners are fixed by the tax law, this method of diverting profits for tax benefits is not possible. Second, even if this is the case, the tax rates during the period under study relevant for the Partnership Firms and Corporations have been lower than the maximum marginal rate for Individuals. As a result, this cannot explain the huge drop in net profits due to the reform. It should be noted that dividend is not deductible in the Indian tax system and is in any case the distribution of post tax profits.

Conclusion of the impact of Tax changes: To conclude, firms do not seem to have reacted to the rise in effective tax rates after 2001 with respect to their Investment, Sales, and Exports. All these are consistent with one other. If Investments are unchanged, production is unlikely to be impacted. Again this is consistent with the lack of impact on the depreciation figures which are a function of the investment level.

However, the net profit response as a percentage of Sales was 10% down from what should have been 17% of Sales down to 7%. In section VII, I elaborate based on this and on evidence from field audits that the response is very likely to be evasion.

The fact that the only possible change that explains the drop in Net-Profits is the rise in other expenses something that could not have affected only the treatment group separately. If owners of firms responded to the removal of exemptions by putting lower effort into their business resulting in lower profits this is not reflected in the two main parameters of their business. It is highly unlikely that there was any other factor that lowered profitability of the non-EOUs in the year 2001 that did not affect the EOUs. This is further strengthened by the fact that even when comparing pre-reform profits with post reform profits for Firms that owned both non-EOUs and EOUs units one sees exactly opposite trends for net profit for the two types of units before and after the reform. While the net profit percentage of the EOUs units went up from 2.3% to 6%, that of non-EOUs corporations run by the same management went down from 5.3% to 4.9%[16]. A detailed analysis of this set of taxpayers is not possible because of the small number of such firms in the data set.

[16] There are only six firms in the data set which makes the statistical significance very low to make a conclusive finding.

One possible method of reducing the net-profit would be to hide Sales. This is unlikely with exporting firms for two reasons. First, exports move through well-defined customs channels which are government entities who record the quantity and value of exports. Second, exporters are entitled to drawback on duties paid by them which is measured as a percentage of the export value. This export incentive is much bigger than the income tax that exporters are liable to pay. As a result, it is in the interest of the exporters not to suppress sales or divert it through other channels.

In light of all these facts above that suggests that investments were unaffected even while profits were most likely evaded is consistent with the weak institutional environment in India. One would expect a higher tax rate to have a direct impact on profitability and hence would affect investment decisions. However if taxpayers could evade their tax liability, the impact of taxes is likely to be muted. The implications of this are that in developing countries where the ability of the government to administer tax system effectively is limited, there is unlikely to be a negative impact of tax changes on Investment. Firms could choose alternative methods to 'adjust' to tax changes, especially tax rises without affect their investment decisions considerably.

VII. Evasion Response to higher tax rates

The above analysis was an effort to arrive at the determinants of the response to the change in tax rates due to the tax reform in the year 2000. The response through Net-Profit was a fall of 10.6% post reform while Taxable Income fell by 12.4%. As Net-

Profits form the input for calculating Taxable Income, it could be concluded the excess 1.8% response was the response by better tax avoidance. However, there does not appear to be any response on other parameters that form the input in the calculation of the Net-Profit when the analysis of these parameters was calculated separately.

The estimates for tax evasion can be found by removing the separate components of the response into the net-profits. Out of the 12.4% drop in taxable income, 10.6% drop is only the effect of the lower net-profit before tax. None can be explained by to higher depreciation claims lower Sales or exports and lower cost of production. The only change that could make this possible is a sudden increase in other expenses such as depreciation, administrative costs, interest payments, etc. However this is very unlikely only for the Treatment group. Both the Treatment and Control Group firms are situated close to each other; hence any increases in incidental expenses for one group would have had a similar impact on the other group. Hence the differential response of net profits post reform cannot be explained by higher input costs. As the Gross-Profits did not change post reform which the Net–Profits did not, the only response has to be through the other expenses, because Gross-Profits-Other Expenses = Net Profits. Hence the response directly points to artificially raising of expenses.

This conclusion is corroborated by field audits and searches conducted by the tax department in Tirupur. In 78 field audits conducted by the Tax Office in Tirupur, fake

bills of 1170 mill. rupees were impounded. As a result of this action 50 other firms voluntarily filed revised tax returns declaring an additional 440 mill. rupees in Income[17].

These field audits discovered that the most popular means of tax evasion was by artificially raising the expenses using fake bills, popularly called 'Entries'. Field audits revealed that there exists an elaborate network of "Bill Issuers" whose primary role was the issue of fake bills for a commission. The fake bill issuer would hide the income relating to the expense in a business that would then be linked to a chain of such issuers, generally located in different cities to make it difficult for a local tax official to easily verify these claims. These chains of 'Bill Issuers' could span more than 10 such persons across several cities. Such ingenious networks are very difficult to crack open because any verification of income and expenses involves going down the entire chain which is very time consuming. The tax evaders realize that each of these verifications could take at least a few months being difficult to trace as they are mostly conducted in cash. Further as the tax administration is legally bound to give adequate time to taxpayers to respond to summons and, because the law provided a limited time for tax collectors to complete scrutiny of the tax return, such verifications down the chain are time consuming and invariably end in failure[18]. However, more intrusive methods using surprise checks conducted simultaneously covering several cities have in the past been successful at

[17] Export Industry in Tirupur, A Case Study (mimeo), A Presentation by V.S.Kumar, Joint Commissioner (Tirupur) before the Regional Tax Training Institute, Bangalore, India.
[18] The author had embarked on such futile attempts to uncover the source of the evasion while he worked for the IRS in India.

breaking some chains. Such methods are very costly and require extensive intelligence gathering over long periods of time and are a means of last resort[19].

In the light of such evidence and the findings of this paper it appears that tax evasion is the only plausible explanation for such a large reduction in net-profits without any changes in all other parameters of the business especially Investment.

However, this does not rule out an alternate explanation for this response. It is possible that taking advantage of their tax exempt status prior to 2002, firms laundered income from taxed firms and acted to enable tax evasion by others. On losing the tax exempt status such laundering opportunities became less profitable and were discontinued. This would imply lower profits even when other parameters of the business are not affected. Hence the response that is observed is not likely to be tax evasion for the exporting firm, but a response in the form of lower tax evasion that such a firm assisted in.

While this is a possible explanation and cannot be ruled out, the strength of this argument depends on whether the tax reform in 2000 made such laundering opportunities unprofitable after the tax change. However, this is not true in the present case because the effective tax rates during the period under study 2000 to 2004 as shown in Figure-1 were well below the regular tax rate of 35%. Hence, laundering opportunities continued to exist throughout the period and the evasion response is not likely to be just the 'drying up' of laundering through tax exempt firms. As observed in this paper, most of the response was in the very first year of the tax reform when the effective tax rate was just 7% and at this rate, laundering should continue to be very attractive.

[19] Efforts by the author to get audit data from the tax department failed as the tax department cited legal limitations to allow such data to be collected.

The average Sales of the treatment group is 138 million rupees; hence the amount evaded per year per firm which is 10.6% of the sales is estimated at 14.6 million rupees per firm per year for the sample of firms under study. What is remarkable about this amount is that it is very close to what the field audits uncovered in Tirupur. In 78 field audits there during the period 2003 to 2005, fake bills worth 1170 mill. rupees were found amounting to evasion of 15 mill. rupees per firm.

The moot question is whether the outcomes of this study could be extended to other firms in India. This paper outlines the response of a tax exempt firm going from a zero rate to a non-zero rate and this response is likely to be different to that of a firm going from a lower but non-zero tax rate to a higher rate. Hence any response to tax changes to these groups of firms cannot be extended to all kinds of firms without caveats.

I would argue that this is not the case for two reasons. First, this paper analyzes the response of firms using an average response for four years the higher tax rate was in effect. During this period the tax changes during 2001 to 2004 was between non-zero tax rates. This would imply that the estimates of elasticity that this paper measures should be closer to that of firms that are already taxed. Second, the exporting firms operate in the same environment as non-exporting firms and their responses especially their evasion response is not likely to be very different from non-exporting firms as they use the same networks that allow for such evasion. Hence, the results of this paper are likely to be very useful to understand how all types of firms respond to tax changes in India.

IX. Conclusion

This paper has shown that taxpayers in India did not show any response to higher tax rates in their Investment. However they showed a substantial response to the declared profits. The setting of this natural experiment is very relevant factor to this (surprising) response of taxpayers. It is set in an environment with a weak institutional capacity to detect and punish tax evaders. As a result most of the response of the higher tax rates has not been on the investment decision but through outright tax evasion. Being one of the first studies of its kind in a developing country these conclusions reveal a very interesting behavioral response of firms. As more such studies are conducted we would be better able to understand that the impact of weak tax compliance in a weak institutional setting on investment decisions of firms which has important implications for tax policy in India and developing countries.

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