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The Market for Endogenous Trade Protection: Antidumping and Tariff Protection in South Africa's period of Transition

Masters Dissertation

School of Economics

University of Cape Town

by

Robert Price[1]

Supervisor: Associate Professor Lawrence Edwards[2]

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[1]Available at: Price58@hotmail.co.uk

[2]I am grateful for the assistance from my supervisor. I am would also like to thank the University Research Council for my thesis.

Abstract

This paper examines the relationship between tariffs and antidumping (AD) within the political economy of trade protection in South Africa. Using graphs, tables, panel data regressions and an application of the Grossman-Helpman model I build an understanding of the relationship between tariffs and AD. Findings are that AD has increased with the decrease in tariffs. However this relationship is not a clear-cut substitution from one trade remedy to another. The GH model suggests that both tariffs and AD are determined within the political economy. This finding is consistent for the whole period of investigation, from 1992 until 2009. Interesting to note; the data does suggest that government's goals when setting trade policy have changed over time with social welfare entering the equation at some point. However this is definitely not at the forefront of policy. Lobbying appears to be a dominant feature in the South African market for trade protection. The importance of vested big business interests in trade policy ensures that both tariffs and AD are used strategically by government when determining the level of protection in the economy.

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1 Introduction

Under a new democratic government in 1994 South Africa undertook a period of rapid trade liberalisation. Average MFN tariffs fell from above 14% in 1992 to about 8% in 2001. At the same time South Africa became one of the heaviest users of AD policy in the world. Between 1 January 1995 and 30 June 2002, 106 investigations were initiated by South Africa, 157 with AD duties making SA the fifth largest user after the US, EU, India and Argentina (Joubert, 2004). International evidence indicates that such a pattern of tariff reduction and increasing use of contingent barriers to trade like antidumping (AD), countervailing duties and safeguards has emerged in many countries around the world (Moore and Zanardi, 2008). While initially intended as a measure to try and promote fair trade AD has degenerated into a tool for countries to try and advance their strategic position over one another and thus AD is perhaps, currently, the greatest barrier to trade (Blonigen and Prusa , 2001; Bhagwati et al., 1998).

Investigating this simultaneous reduction in tariffs and increased use of AD is the primary objective of this paper. From an initial glance the movement in tariffs and AD suggests that there may be significant substitution from the one form of protection to the other. If indeed AD is a substitute for tariffs this could lead to one questioning whether certain countries have liberalised their trade policy as much as previously thought[3]. Debate over the level of liberalisation of South Africa's trade policy is intense thus finding a relationship here contributes to this debate and the wider literature of trade policy in South Africa (Edwards, 2005; Fedderke and Vase, 2001).

There are obvious benefits for governments to use AD as a substitute for tariffs during periods of liberalisation. Protection through AD will ease the political pressures faced by government from domestic industries that are under threat from the increased competition (Moore and Zanardi, 2008). Furthermore WTO legislation is formulated in such a way that there are a number of loopholes. This loopholes allow countries to use AD in a strategic way and thus it becomes rational to use it as a domestic policy instrument (Blonigen and Prusa, 2001)[4].

The secondary objective of this paper is to use this tariff AD dynamic to study the market for endogenous protection[5]. To achieve this goal I investigate the relationship between government

[3]This is fundamentally important particularly if the use of AD is on products where the use of tariffs is bound by WTO legislation because this could be sustaining tariff peaks, which are particularly costly to the consumer.

[4]WTO ruling over AD usage has been relatively weak and certain countries have actually been able to manipulate WTO antidumping legislation in their favour (Blonigen and Prusa, 2001).

[5]In this market government supplies protection and industry demands protection (Rodrik, 1995). Industry desires protection so as shelter the market that it operates in and thus increase or protect its profits. Government on the other hand has its own interests which are quite country specific (Baldwin, 1989). These interests range

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and industry during trade reform and uncover the determinants behind both parties' decisions.

These determinants are of particular interest in a country like South Africa where there is constant tension between the interests of big business, which drives South Africa's economy, and the millions of poor who live below the poverty line. Whose interests does government consider when deciding on trade policy and how do they balance these interests?

This question is not only of interest in South Africa but the environment is one that lends itself to such a study. Two reasons are identified below.

Firstly, South Africa has a strong history of industrial lobbying (Edwards and Alves, 2006; Bell, 1997). This implies that the relationships and the interactions between government and industries are significant. Suspicions are that industrial lobbying continues to exist in a post-apartheid world.

Secondly, in 1994 the African National Congress (ANC) government was democratically elected and voted for by the majority of South Africans as opposed to the apartheid government who represented a few specific interests within the country. This period of structural political transition has had potentially interesting effects on trade policy. Considering that the two different governments had very different constituencies we may expect to see them impose different policies in SA. Furthermore the composition of influence from industry on government changes; rather than only being influenced by big business we may expect the ANC to be influenced by unions and industries that have preferred racial demographics. Thus the dynamic through which industry effects trade policy may be different depending on the time period or trade protection tool that is being used. I investigate this through the use of disaggregated cross-sectional data.

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When analysing the government industry relationship the specific focus on AD has its own particular advantages. While political economy factors affect all forms of trade reform AD is perhaps the most affected. This is due to the legislative process that must be completed for AD duties to be put in place; which includes applications, delegations, log-rolling and beaurocratic government bodies and weak WTO law (Blonigen and Prusa, 2001). South Africa is no different to other countries in this respect (Joubert, 2004).

Furthermore, studying both tariffs and AD allows us to uncover information on the relationship between government and industry that was perhaps not apparent before. Firstly, while many liberalisation periods were exogenously driven by commitments to the WTO, AD cases are endogenously formed by domestic industry applying to their relevant authorities (Bown and

from revenue, social welfare and votes relating to re-election. Government and industry interact in the market for protection with their own interests in mind and arrive at a certain level of protection in the economy.

Tovar, 2010). As mentioned above, there is a lengthy beaurocratic procedure and as such interests that are central to the domestic country will come to the fore rather than exogenous factors. Empirical techniques are used to try and determine whether the reform process has been endogenous or exogenous.

The second advantage of AD is that by looking at AD as well as tariffs ensures that vital pieces from the South African political transition are included in the analysis. While ANC government was part of the tariff liberalisation negotiations pre-1994 they were not yet in government. Thus, they perhaps did not or could not implement all of their new policies, which were mandated by the change in political constituencies, on the negotiations. However, since most of the AD negotiations were conducted later on in the 1990's the new government was in power and thus the ANC was able to implement their own social welfare considerations on the latter process. Without the simultaneous use of both AD and tariffs understanding of this relationship would be difficult.

In order to study the relationship between tariffs, antidumping, government and industry I implement two different estimation procedures. The first is panel data regressions. The major findings from this section are that there is a strong relationship between tariffs and AD in South Africa. While AD has been used in response to a reduction in tariffs and formula duties in South Africa it is perhaps not a clear cut substitution relationship from tariffs to AD. These regressions also investigate the cross-sectional determinants of AD usage. I find that aspects such as a higher capital stock, less employees and more concentrated industries rather than social welfare or racial demographics are significantly related to AD protection. The second estimation is the implementation of the Grossman-Helpman model. Following the methodology of Bown and Tovar (2010) this procedure sheds light on the relationship between tariffs and AD as well as the political economy dimension in the market for protection. I find that both tariffs and AD continue to be endogenously determined in the market for protection in SA over time. This implies that the relationship between government and industry determines the structure of tariff protection in South Africa rather than external factors and perhaps suggests that AD is reinforcing the effect of tariffs. This strengthens the findings of the cross-sectional panel regressions. Together the results indicate that trade policy is being used strategically by government to enhance the interests of business rather than social welfare.

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2 Tariffs and Antidumping in South Africa

South Africa also has a long history of using trade policy to effect output performance (Joubert, 2004). It has thus become a strong determinant of the performance and structure of the economy (Edwards and Lawrence, 2008). In this section we review the use of trade protection in SA and, using tables and graphs, conduct a preliminary investigation into the relationship between tariffs and AD. The tariff data is an updated version of Edwards (2005) tariff database[6]. AD data is from the World Bank's Global AD Database (Bown, 2010a). This database includes information on imports which is disaggregated by country and year. Sales data is also used in this analysis and is available from STATSA's quarterly manufacturing census.

Table 1: Decomposition of tariffs in South Africa (Edwards, Cassim and van Seventer, 2009)

	1994	2000 MFN	2006 MFN	2006 EU	2006 SADC
1. Number of tariff lines	11231	7868	6420	6420	6420
2. Share ad valorem (percent)	69	75	97	97	99
3. Number of tariff bands	770	214	100	95	9
ad valorem	31	38	38	37	6
Other	739	176	62	58	3
4. Duty-free tariff lines (percent all lines)	26.1	44.4	53	66	99
5. Domestic tariff "spikes" (percent all lines)[a]	3.7	4.8	8.8	14	0.49
6. International tariff "spikes" (percent all lines)[b]	43.5	35.2	21.2	8.8	0.2
7. Coefficient of variation [c]	1.1	1.2	1.4	1.6	16
8. "Nuisance" applied rates (percent all lines)[d]	1.5	1.2	1.3	0.8	0
9. Simple average	17.9	12.8	8.2	4.8	0.1
10. Weighted average	15.7	8.1	7.4	7.9	0.0
11. Bound tariffs		96.4	96.6		

Source: Edwards (2005), updated with the 2006 tariff schedule obtained from SA Revenue Services.

Notes: Calculations are based on tariff schedules including *ad valorem* equivalents. SACU refers to Southern African Customs Union.

a. Domestic tariff spikes are defined as those exceeding three times the overall simple average applied rate. For 2002 and 2006 these are presented separately for each trade agreement.

b. International tariff spikes are defined as those exceeding 15 percent.

c. Coefficient of variation is calculated as the standard deviation divided by the overall simple average.

d. Nuisance rates are those greater than zero, but less than or equal to 2 percent.

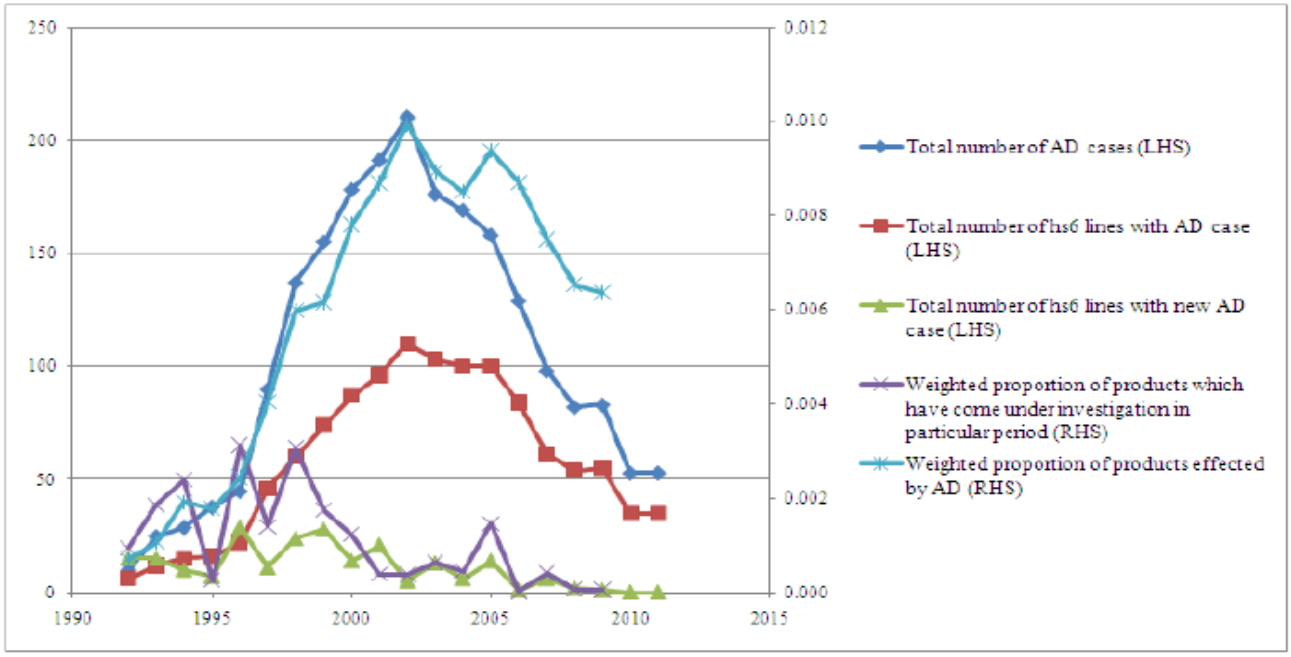
Under the apartheid government trade policy was characterised by the policy of import substitution (Edwards, Cassim and van Seventer, 2009; Edwards and Lawrence, 2008; Holden, 2002)[7]. However during the 1990's, both before and under the ANC government, South Africa

[6]The tariff database was constructed by L Edwards using tariff schedules from the South African Revenue Services and government gazettes.

[7]While there was slight liberalisation during the 1970's when the government tried to diversify out of raw materials the 1980's was a period of strong protectionism. Import surcharges and export subsidies were heavily used and the levels of protection granted to industries increased (Bell, 1993).

undertook a period of liberalisation[8]. Tariffs were liberalised, 98% of tariff lines were bound and the whole tariff structure was rationalised. This meant that the number of tariff lines dropped from 12000 in the 1990's to 6420 in 2006 and specific, mixed, compound and formula duties were replaced by ad valorem duties (Edwards, Cassim and van Seventer, 2009). Table 1 shows the change in the composition of tariffs during the 1990's.

Figure 1: AD use over time



Source: Own Calculations using data from Global Antidumping Database (2010)

Note1: Effected by AD is measured as whether or not there was an AD investigation is in place on that particular product line. New investigation is whether or not a new AD investigation was opened on that particular product line in that period.
Note2: The weighted proportion series' are measured on the right hand axis.
Note3: The same weighting mechanism as Bown (2010) "Taking stock of Antidumping, Safeguards and Countervailing Duties, 1990-2009" is used here where I trade weight with import data. This addresses the likelihood of substantial heterogeneity in the importance of certain HS6 products over others.

Concurrent to the liberalisation in tariffs there has been a large increase in the use of AD measures. Figure 1 shows this; depicting the movement in a number of different ways. The number of product lines which are affected by AD cases, the number of AD cases and the

[8]Liberalisation under the ANC was more than many had predicted. In fact some of the liberalisation pre-1994 by the apartheid government was motivated by fears over the possible protectionist policies that the ANC would introduce (Bell, 1997). However post-1994 liberalisation increased and was a strong differentiating factor between the economic policies of the two governments (Edwards and Lawrence, 2008).

weighted proportion of products affected by AD cases have all increased since 1992 reaching a peak in 2002. Interestingly there has been a significant decline in the use of AD duties since 2002. The two other series, which are at the bottom of figure 1, show the number of product lines with new investigations opened in that period and the weighted proportion of products which have new investigations in that period. These two graphs show that the number of new investigations has been relatively volatile between 1992 and 2009 however there has been a remarked decline in the number of new investigations since 2000.

One can now see that there is a strong negative relationship between tariffs and AD usage in South Africa. As tariffs have been rationalised and decreased in their effective protection AD usage has increased. AD usage has not only increased but the duties are large and they account for a significant proportion of the rate of protection in South Africa. Figure 2 proves this by graphing the tariff rate, the AD rate and the combined rate of protection. Two versions of the AD rate have been included: in the first version the average AD duty is calculated just on those products which have AD duties, in the second version those products which don't have AD duties are included in the mean and treated as zero. Version 1 (measured on RHS of graph) shows us that the duties that are applied are large and thus they can be particularly distortionary. By comparing the average tariff and the combined rate we can see that AD increases the rate of protection significantly above the tariff rate of protection.

While it is now established that AD duties contribute significantly to tariff protection it is the relationship between the two that we are interested in here.

Figure 3 shows that products which have AD cases have significantly higher tariffs on average than the product lines which don't have AD cases. This could indicate that there has been large liberalisation on the high tariff products leading to them being protected by AD cases. However, looking at figure 3 we see that liberalisation has been relatively equal between the two categories. This finding of more AD protection on products which are already protected by tariffs is contrary to our initial predictions that those products which have low tariffs might be protected by AD instead. This finding requires further investigation but it suggests that to some extent AD duties are complementing tariffs rather than substituting for them.

To give another perspective on this relationship I decided to look at it from two different angles. First, figure 4A shows the proportion of products with AD cases divided into those products which had high and low tariffs between 1991 and 1995. The high tariff category includes products were tariffs where above the 1991-1995 mean and the low tariff category includes products where the tariff where below the mean. There is a higher proportion of products with AD cases when tariffs are high than when they are low. This is similar to what was found above

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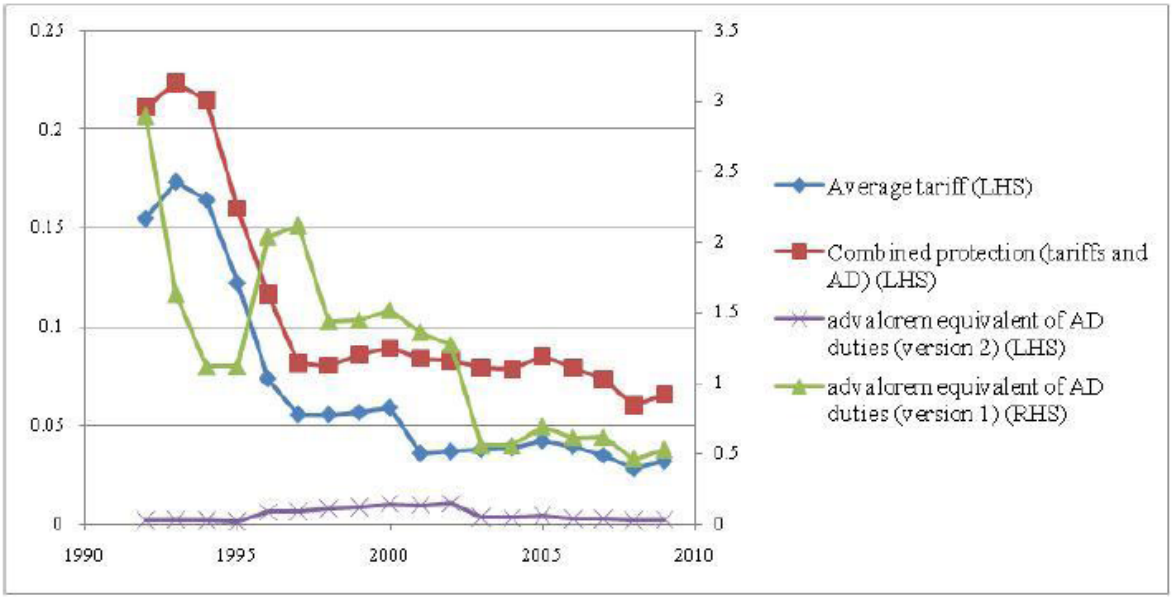
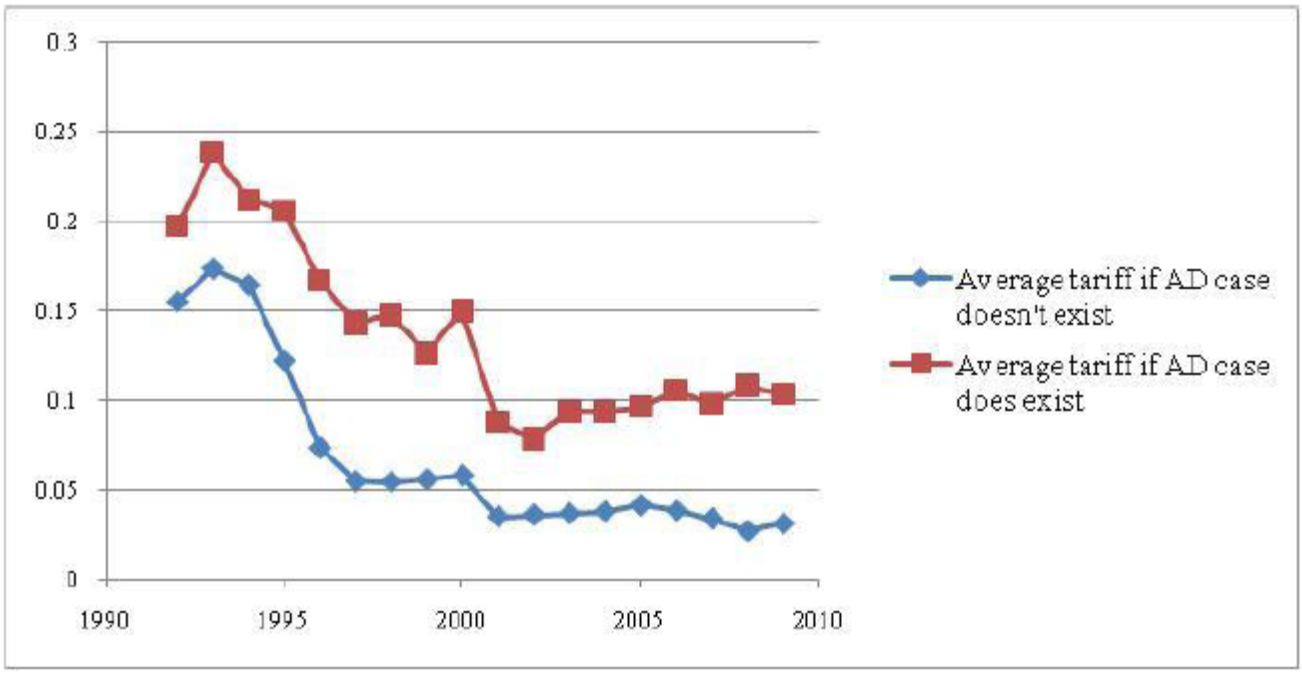
Figure 2: Tariff and AD rates protection protection



Source: Own Calculations using data from Global Antidumping Database (2010) and Edwards (2005)

Note1: All of the series have been weighted by the counterfactual import values (Bown, 2010).
Note2: Many of the AD duties are specified as specific duties thus the ad valorem equivalents of AD duties were manually constructed from the AD database. The database gives both a maximum and minimum margin for the implementation of the duties. In these graphs I have used the maximum duties so as to show just how distortionary the duties can be.

Figure 3: Movement in Tariffs



Source: Own Calculations using data from Global Antidumping Database (2010) and Edwards (2005)

Note: "If and AD case exists" means if a particular HS6 line has an AD investigation on it at the time.

and suggests that there is a reinforcing effect of the two trade remedies in South Africa.

Second, figures 4B and 4C show the proportion of products with AD cases divided into those products which had high and low liberalisation between 1991-1995 and 1996-2002 respectively. Where high liberalisation lines are those that have more than average liberalisation and low liberalisation lines have less than average liberalisation. 3B indicates that those sectors which experienced more liberalisation between 1991 and 1995 received slightly more AD protection. However 4C suggests something different; that the AD is reinforcing tariffs. Those sectors that had little liberalisation actually received significantly more AD protection than those which liberalised more. These figures suggest that the South African case is not clear cut substitution between tariffs and AD as Bown and Tovar (2010) found in the Indian case[9]. Perhaps, when compared to the India case, there are other factors which are coming into effect in South Africa.

The second objective of the paper is to investigate how the cross-sectional composition of sectors influences the relationship between government and industry over trade policy. This is not only interesting but will provide insight into what makes the results in South Africa different from other countries.

Blonigen and Prusa (2001) note that the way in which AD law is constructed gives government the opportunity to offer protection to preferred industries without blatantly violating GATT/WTO principles. The fact that applications for protection are made on a case-by-case basis in South Africa supports this idea that government can provide protection to politically favoured industries (Edwards, Cassim and van Seventer, 2009). Thus when applications for dumping duties come to the Board of Tariffs and Trade (BTT), who must process the investigations with limited resources, they are susceptible to lobbying or are inclined to offer protection to certain industries (Holden and Casale, 2002).

In order to gain insight into whether certain industries may gain protection over other I outline the sectoral distribution of AD cases in table 2. It shows that AD cases within the South African manufacturing sector are highly concentrated, with the base metals sector being the dominant user between 1992 and 2009 with 120 new investigations. Thereafter the vegetables, chemicals, plastics, paper, textiles & clothing and non-metal mineral products sectors are all relatively heavy users of AD measures. These sectors are also import in terms of output and imports. Chemical products account for just above and base metals just less than 20% of output between 1992 and 2009.

There are a number of sectors that did not have any AD measures imposed at all during the

[9]Bown and Tovar (2010) find that there is substitution from Tariffs to AD during India's exogenous tariff reform in the 1990's. This case will be explained further in the later sections of the paper.

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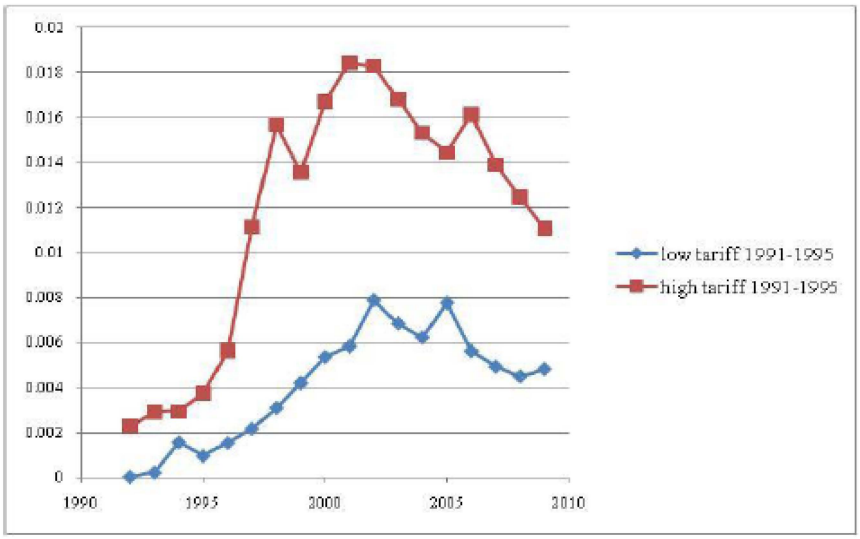
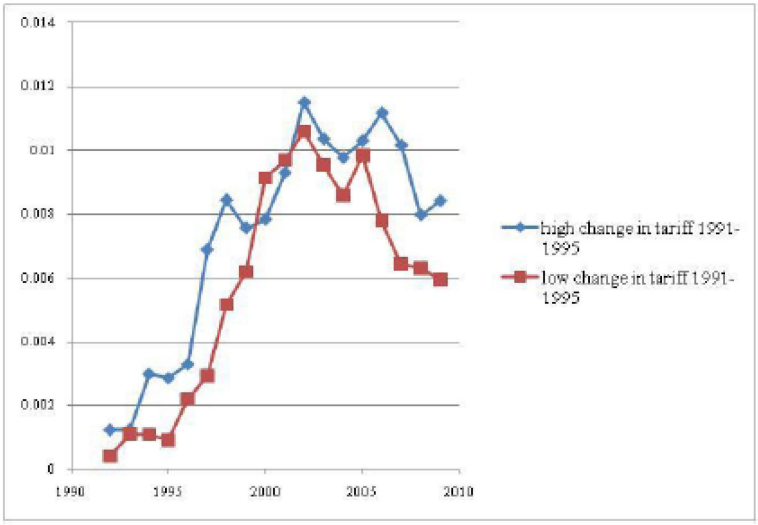
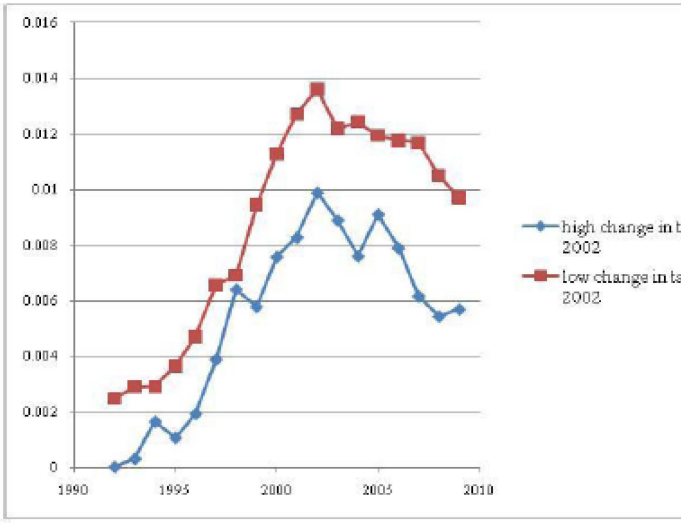
Figure 4: Proportion of products with AD cases

A: The products were divided by the mean change in tariff from 1991 to 1995



B: The products are divided by the mean change in tariff from 1991 to 1995 (below)





C: The products are divided by the mean change in tariff from 1996 to 2002 (abo

Source: Own Calculations using data from Global Antidumping Database (2010) and Edwards (2005)

period; this can be seen from column one. Furthermore the duties that are imposed are quite high. On plastic products they average up to a substantial 300% on the price.

Returning to the relationship to tariffs we can see that the sectors with the highest levels of tariff liberalisation did necessarily get AD protection. The food, beverages and tobacco, footwear and transport equipment sectors are good examples of this.

Table 2: Tariffs and AD by sector

Section 23 Classification	Number of new AD investigations	Proportion of manufacturing product lines with AD	Weighted advalorem equivalent of AD duties	Average weighted tariff 1992-2009	Average Change in weighted tariff 1992-2009	Proportion of manufacturing sales 1992	Proportion of manufacturing sales 2009	Proportion of manufacturing imports 1992	Proportion of manufacturing imports 2009
C01: Live animals, animal products	12	4%	1.811	0.150	-0.122	4%	1%	1%	1%
C02: Vegetable products	48	1%	1.207	0.025	0.007	3%	1%	1%	2%
C03: Animal or vegetable fats & oils	3	0%	0.270	0.086	-0.080	2%	1%	1%	1%
C04: Food, beverages & tobacco	2	1%	1.184	0.081	-0.231	11%	6%	3%	3%
C05: Mineral products	1	0%		0.001	-0.018	0%	0%	0%	22%
C06: Chemical products	52	13%	0.362	0.018	-0.056	24%	22%	23%	9%
C07: Plastic products	52	10%	2.992	0.069	-0.066	5%	6%	11%	4%
C08: Raw hides	0	0%		0.153	0.023	1%	0%	1%	0%
C09: Wood products	4	0%		0.033	-0.016	0%	1%	0%	0%
C10: Paper products	41	6%	0.382	0.040	-0.038	4%	4%	6%	2%
C11: Textiles & clothing	74	21%	0.658	0.246	-0.108	11%	7%	19%	3%
C12: Footwear	6	0%		0.286	-0.165	1%	1%	2%	1%
C13: Non-metallic minerals	40	7%	0.743	0.064	-0.078	2%	2%	0%	1%
C14: Precious stones and metals	0	0%		0.009	-0.037	0%	1%	0%	1%
C15: Base metals	120	29%	0.562	0.038	-0.086	18%	18%	9%	4%
C16: Machinery	12	5%	0.592	0.019	-0.045	11%	17%	17%	26%
C17: Transport equipment	4	0%		0.179	-0.451	2%	3%	5%	9%
C18: Specialised equipment	9	3%	0.375	0.003	-0.015	1%	2%	1%	3%
C20: Misc manufact articles	2	0%		0.084	-0.136	1%	4%	1%	2%
C21: Collectors' pieces & antiques	0	0%		0.000	0.000	0%	0%	0%	0%
C22: Other unclassified goods	0	0%			0.000	0%	0%	0%	6%
Total	482	100%			0.000	100%	100%	100%	100%

Source: Own Calculations using data from Global Antidumping Database (2010), Edwards (2005) and STATSA's Quarterly Manufacturing Census.
Note1: the AD rates in this table are once again the maximum margin.
Note2: "new investigations" are those that are opened in the relevant period.

There is large variation across sectors in SA both in terms of protection coverage and economic importance. The relationships apparent here encourages investigation into the tariff AD relationship between sectors using empirical techniques.

3 Panel Data Regressions

3.1 Methodology

The panel data regressions unpack the sectoral distribution of tariffs and AD, analysing the relationship between the two. The main objective is to empirically prove that movements in tariffs are significantly related to movements in AD; thereafter the cross-sectional determinants of the relationship are uncovered. The general specification for the panel data regressions is as

follows.

$$AD_{i,c,t} = \alpha_0 + \alpha_1 TAR_{i,c,t} + \alpha_j controlls + \epsilon_{i,c,t} \quad (1)$$

Where I use a dummy variable for AD which tells us whether or not a HS6 line has an AD case against country i in year t. $\text{TAR}_{i,c,t}$ is the tariff on product i in year t[10]; this investigates whether movement in tariffs are correlated to the movement in AD. Thereafter I include a number of controls to ensure that the specification of the model is correct as well as to explore the determinants behind AD cases in SA and establish whether there is a relationship between cross-sectional industry differences and levels of protection. While this regression analysis is an atheoretical approach where we merely try to see the relationship between AD and tariffs it is important to ensure that the controls comply with theory.

There are four main factors that affect the level of protection in a country: the benefits to government from awarding a lobby, the ability of an industry to lobby, the characteristics of an industry that make them liable to receive protection and the social welfare considerations that government takes into account when deciding on trade policy.

First, the benefits that accrue to government from awarding protection are either through the receiving of votes from a particular industry or through campaign contributions (Caves, 1976; Baldwin, 1989). Both will in turn help them with re-election. I include information on the number of employees in an industry in order to account for voters. Unfortunately campaign contributions data is not available in South Africa. Thus this is a difficult aspect to account for. However, it is a crucial to the GH model and will be returned to in the work that follows.

Second, the ability of an industry to lobby for protection depends on how well they are organised, their size and their concentration[11]. In order to account for this I include variables of firm's size and the four firm concentration ratio (Gawande and Krishna, 2003).

Third, there are characteristics that make certain industries likely to receive protection over others. For example, exchange rate depreciation, ceteris paribus, decreases imports into a country which in turn decreases the likelihood that an industry may require protection [12](Blonigen

[10]TAR has been subscripted by c because the South African tariff regime also varies by preferential trade agreement; EU, SADC or MFN. This does not make much difference in the early 1990's because the preferential agreements were not in place yet. However from 2000 onwards the tariff regimes do differ.

[11]There is wide literature which looks at the determinants behind industrial lobbying. Olsen (1965), Art and Gilligan (1994) and Caves (1976) discuss the ability of concentrated industries to overcome collective action problems and free riders in the non-excludable protection market through lobbying.

[12]Blonigen and Prusa (2001) argue that there are two different effects of the exchange rate on AD investigations. The first is that ZAR depreciation lowers the price of foreign firm's exports to SA in the foreign

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and Prusa, 2001). Government may also be more likely to afford protection to a sector which experiences a sudden decrease in output because of the threat of job losses and closure (Olsen, 1965). I thus include information on exchange rate, imports and output in the regression analysis.

Fourth, government might consider social welfare when determining trade policy[13]. It is well noted that the ANC government has looked to address apartheid's unequal distribution of resources and in fact it is a goal of their trade and industrial policy (ANC, 1993; DTI, 2007). I include variables like the ratio of black to white workers and the skill premium in the analysis to probe these relationships.

3.2 Data

The AD, tariff, trade and sales data are from the same sources as mentioned above (Bown, 2010a; Edwards, 2005; STATSA). An Industry level database[14] and exchange rate data were merged onto the AD, tariff and sales data to compile the full dataset which is at the HS6 digit level.

3.3 Results

Since the industry data is only available in 1993 and 1996 I impose of two different specifications on the regressions; one without the industry data and one with it.

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firm's currency; which is the price which is used to examine dumping. Thus because there might be less than immediate adjustment of prices the chances of a case proving dumping is more likely. The second effect says that ZAR depreciation decreases the import penetration which makes injury determination less likely. After reviewing these two effects it seems that the second is probably stronger in the South African case because the first effect assumes that foreign firms price in terms of ZAR. While this might be true of the US it is unlikely to be true of SA, a small price-taking economy.

[13]Typically in developed countries, governments have protected low-wage low-skill industries against competition from developing countries (Trefler, 1994). In developing countries this relationship is less certain; there is vast literature which examines this relationship of who indeed is losing from trade liberalisation. For a comprehensive literature of the social change aspect of trade protection see Caves (1976) and Gawande and Krishna (2003).

[14]This industry level database was manually constructed from the South African Manufacturing Census Surveys (STATSA). It comprises of 150 HS5 digit manufacturing sectors available at the HS 4 digit level. A concordance file was made to map the manufacturing data to Standard Industrial Classification (SIC) and then to the HS data in order to make it compatible with the rest of the data needed for the research. This database contains information on concentration, firm size, level of employment, output, racial demographics of the workforce and the ratio of skill to unskilled workers. Exchange rate data was taken from the South African Reserve Bank.

In the first specification tariffs, the real exchange rate (RER), formula duties, imports and output are the explanatory variables in a regression where the AD dummy is the dependent variable. Sales data is used instead of output data as the output data is also only available in 1993 and 1996. I use a linear probability model (LPM) with industry product fixed effects to control for the time-invariant effects[15]. This regression was run for four different periods: 1992-2009, 1995-1995, 1996-2000 and 2001-2009.

$$\begin{aligned} AD_{i,c,t} &= \alpha_0 + \alpha_1 Tariff_{i,c,t-1} + \alpha_2 d\_tariff_{i,c,t-1} + \alpha_3 RER_{i,c,t-1} + \alpha_4 d\_RER_{i,c,t-1} \\ &\quad + \alpha_5 formuladuties_{i,c,t} + \alpha_6 imports_{i,c,t-1} + \alpha_7 d\_imports_{i,c,t-1} \\ &\quad + \alpha_8 sales_{i,c,t-1} + \alpha_9 d\_sales_{i,c,t-1} + \epsilon_{i,c,t} \end{aligned} \tag{2}$$

[16]

The results are displayed in table 3. They suggest that tariff rates are strongly correlated with AD measures imposed. All the coefficients on the tariff variable are positive which implies that the higher the tariff the more AD protection. The tariff coefficients are significant in all the regressions other than the 1992-1995 period. In fact, many of the results for the period between 1992 and 1995 are inconsistent with theory; this is most likely due to the low number of cases in this period and thus the small sample size for the regressions. The negative coefficient on the change in the tariff variable indicates that liberalisation is significantly related to an increase in AD protection. Together these results suggest that while tariff liberalisation corresponds to increased AD protection, which does indicate substitution, there is a reinforcing relationship between high tariffs and more AD protection.

The real exchange rate has very little correlation with AD cases in SA; the only period where there is a significant result is between 2001 and 2009. This could be in response to the large depreciation of the ZAR in the 2000 and 2001. The formula duty dummy indicates, as expected, that reduction in formula duties is significantly related to an increase in AD[17].

Interestingly imports are not a significant determinant of AD cases. This is unusual given that

[15] Apart from the size of the coefficients there is little difference between using a LPM to a probit in this case because the probability of as AD measure being in place is very low.

[16] "d_ " is when the variable is in first difference form. Note that most of the variables are entered as a lagged value; denoted by $_{t-1}$. This helps to deal with the endogeneity with the regression (Holden and Casale, 2002). Furthermore it makes sense that industry characteristics transfer through to protection over time and not immediately.

[17] In 1978 the Board of Trade and Industries (BTI), the body which oversaw trade remedies at the time, decided that all AD measures would be eliminated and formula duties would instead be used to protect against dumping. However formula duties were phased out by the WTO and thus during the 1990's South Africa began move back from formula duties to using AD again (Joubert, 2004).

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increased imports give rise to increased competition which is likely to lead to domestic firms to request protection. However it perhaps merely suggests that the BTT is not influenced by the actual level of injury from imports when deciding on protection outcomes. Decreases in sales are related to increases in AD usage, as we would expect.

Table 3: Regression of AD cases over time

	If AD case existed on that line			
VARIABLES	(1) whole period	(2) 1992-1995	(3) 1996-2000	(4) 2001-2009
lagltar	0.00528***	0.00244	0.0281***	0.00370**
	(0.00133)	(0.00301)	(0.00697)	(0.00166)
lagdltar	-0.00513***	-0.000907	-0.0263***	-0.00240**
	(0.00149)	(0.00147)	(0.00823)	(0.00102)
laglrer	-0.00121	0.000814	0.000795	-0.000582
	(0.000833)	(0.00108)	(0.00241)	(0.000685)
lagdlrer	-0.000642	-0.000912	2.97e-05	-0.000913*
	(0.000555)	(0.000949)	(0.00147)	(0.000481)
Dformula	-0.00162***	-0.000270*	-0.00964**	-0.000471*
	(0.000436)	(0.000160)	(0.00419)	(0.000253)
laglimports	-0.000101	0.000158	0.000139	-9.37e-05
	(7.85e-05)	(9.86e-05)	(0.000182)	(6.08e-05)
lagdlimports	-4.19e-05	-5.81e-05	-0.000162	2.03e-06
	(4.47e-05)	(6.56e-05)	(0.000115)	(3.55e-05)
laglsales	-0.000851*	0.00337**	-0.000469	0.000156
	(0.000450)	(0.00150)	(0.000849)	(0.000681)
lagdlsales	0.00102*	-0.00102	-0.000152	0.000959
	(0.000590)	(0.00100)	(0.000677)	(0.000701)
Constant	0.0146**	-0.0562**	0.00428	5.82e-05
	(0.00726)	(0.0256)	(0.0140)	(0.0114)
controll for time variation				
Observations	595,863	46,760	137,469	411,634
R-squared	0.001	0.001	0.004	0.001
Number of id	79,891	25,751	41,771	75,085
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

In the second specification the purpose is to check that the tariff relationship is consistent, and to investigate the cross-sectional determinants of AD protection. In order to ensure that we are looking at the industry characteristics correctly the estimation is separated into time periods where the industry variables do not vary. Since the data here does not vary over time I cannot control for the unobserved fixed effects and thus I run a probit model.

$$\begin{aligned} AD_{i,c,t} &= \alpha_0 + \alpha_1 Tariff_{i,c,t-1} + \alpha_2 d\_tariff_{i,c,t-1} + \alpha_3 RER_{i,c,t-1} + \alpha_4 d\_RER_{i,c,t-1} \\ &\quad + \alpha_5 formuladuties_{i,c,t} + \alpha_6 CR4_{i,c,t-1} + \alpha_7 capital_{i,c,t-1} + \alpha_8 employment_{i,c,t-1} \\ &\quad + \alpha_9 d\_sales_{i,c,t-1} + \epsilon_{i,c,t} \end{aligned} \tag{3}$$

The results are displayed table 4. I find that the tariff AD relationship here is consistent with the first specification. While it suggests that there might be some substitution from tariffs to AD the previous evidence that we have seen advices that this relationship is more complicated than it was in India for Bown and Tovar (2010) because there is also a relationship between higher tariffs and more AD protection.

The results also suggest that sectors which are more concentrated, have higher levels of capital and less employment are correlated with higher AD protection. Initially I predicted that protection might be related to higher levels of employment and a previous disadvantaged racial composition within industries because of the social welfare aspect of trade policy. This was motivated from the policy commitment of the ANC and social welfare theory of trade policy (ANC, 1993; DTI, 2007; Ball 1976; Caves 1976; Gawande and Krishna, 2003). These results advocate otherwise. The fact that capital and industry concentration are significant may suggest that big business continues to be powerful in the SA economy no matter the regime. However the coefficient on the ratio of white to black workers and ratio of skilled to unskilled workers does suggest that protection is related to sectors which have a more black and or unskilled workers. Thus there is some social welfare relationship but it is not as strong as the other relationships found.

Interestingly, as predicted, results change over time suggesting that there are different forces at play in the political economy of trade reform and protection in SA over time. This finding ties in with the political history of South African trade reform with changing parties and political consistencies over time.

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Table 4: Probit regressions of AD cases in a cross-section - looking at correlations to industry characteristics

	If AD case existed on that line			
	(1)	(2)	(3)	(4)
VARIABLES	whole period	1992-1995	1996-2000	2001-2009
lagltar	1.796***	0.712**	1.663***	2.311***
	(0.0796)	(0.294)	(0.133)	(0.122)
lagdltar	-0.877***	-0.259	-0.0537	-1.186***
	(0.247)	(0.917)	(0.503)	(0.297)
laglrer	0.0518***	0.0276*	0.0411***	0.0544***
	(0.00269)	(0.0151)	(0.00469)	(0.00342)
lagdlrer	-0.187**	-0.295	-0.00561	-0.314***
	(0.0734)	(0.545)	(0.139)	(0.0818)
Dformula	0.0571***	0.0501***	0.194***	
	(0.0132)	(0.0170)	(0.0524)	
cr4e	0.0953**	-1.123***	0.249***	0.0622
	(0.0415)	(0.370)	(0.0762)	(0.0508)
L.cap	1.37e-10***	2.60e-10***	1.20e-10***	1.45e-10***
	(0)	(5.52e-11)	(0)	(0)
L.empl	-1.32e-05***	-1.84e-05***	-1.31e-05***	-1.39e-05***
	(7.42e-07)	(4.98e-06)	(1.56e-06)	(8.25e-07)
D.lgout	0.0369***	-0.000342	0.0530***	0.0334***
	(0.00891)	(0.0323)	(0.0200)	(0.0103)
wht_blk	-0.0999***	0.0446	-0.114***	-0.0907***
	(0.0218)	(0.0624)	(0.0373)	(0.0289)
unsk_wshare	0.275***	-0.982**	0.0520	0.380***
	(0.0604)	(0.401)	(0.108)	(0.0758)
Constant	-3.279***	-2.006***	-2.811***	-3.391***
	(0.0619)	(0.321)	(0.0893)	(0.0733)
controlls for time variation				
Observations	608,302	52,249	150,377	405,485

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

3.4 Robustness Checks

In order to check that the results were consistent and that the tariff AD relationship is reliable I made use of three levels of sensitivity checks.

First, all the regression were estimated using a different dependent variable. The first AD dummy tells us if there is an investigation on a particular line. The one used here is if there is a duty in place, either preliminary or final, on a particular product line. The first approach is used because it is well noted that the effects of AD cases are not only felt when there is a final AD duty put in place (Staiger et al., 1994). Staiger et al. (1994) argue that there are three non-duty effects: the investigation effect, the suspension effect and the withdrawal effect. The results of these regressions are in the appendix as tables 10 and 11. The results from these sensitivity check regressions are very similar to what we found above and do not require any additional interpretation.

The second check changes the specification of the regressions with respect to the explanatory variables. Rather than entering imports and sales separately they were entered as a ratio of imports to output. This did not change the results significantly.

Finally, to check that the results in the two different sets of results are consistent with each other I run the second set using a linear probability model as well as the preferred probit model. The results of these regressions are in the appendix as table 12. The results are once again very similar to the results found above; the sizes of the coefficients are different but this is due to the specification of the model not a change in the relationship of the variables.

The sensitivity checks imply that the results are robust to changing of the dependent variable, the specification of the explanatory variables and the type of estimation used; which strengthens the outcomes.

The finding of a relationship between tariffs and AD is a success. However, as has been noted, it is not a clear cut one. This motivates the use of model which is theoretically consistent with trade policy implementation worldwide. In the next section I use the GH model to deepen the investigation into the relationship between tariffs and AD. The estimation reveals information of whether or not AD and or tariffs are determined within the political economy of trade reform. This sheds light on whether or not tariffs and AD can be regarded as substitutes. The estimation also continues to probe the political economy of reform in South Africa.

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4 Grossman-Helpman Model for Endogenous Protection

4.1 Review and Methodology

The GH model was originally built by Gene M. Grossman and Elhanan Helpman (1994). Since then extensive work has been done to apply it empirically. Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000) were the first papers to conduct structural versions of the GH model in the US. I follow their methodology as well as that of Bown and Tovar (2010) in my estimation. Holden and Casale (2002) have estimated the Grossman-Helpman (GH) model in South Africa. They conduct cross-sectional regressions using whether or not an industry is successful in their application to the BTT as their dependent variable. This is relatively similar to the first estimation strategy that I used[18].

[18]There has not been much work done on the GH model in SA. Margaret McMillan has also some work on this area in South Africa; this work is forthcoming.

The GH model of endogenous protection is the one of the most widely used trade models. Beginning from first principles the model derives a set of testable predictions of the cross-sectional differences and determinants of protection; which are based on government industry interaction (Bown and Tovar, 2010). It is intuitively appealing because the differences should be explained by merely three different variables; import elasticity, the import-penetration ratio and whether or not an industry is organised (Goldberg and Maggi, 1999).

In this model there is a standard utility function in a multiple goods model and a Nash bargaining game. Industries maximise their welfare subject to the loss of paying for lobbies. Government maximises aggregate welfare and the contributions they get from industry. The first order conditions lead to this solution.

$$\frac{t_i}{1+t_i}e_i = \gamma\frac{X_i}{M_i} + \delta I_i\frac{X_i}{M_i} + \epsilon_i \tag{4}$$

[19]

where

$$\gamma = \frac{\alpha_L}{\frac{\beta}{1-\beta}+\alpha_L}; \delta = \frac{1}{\frac{\beta}{1-\beta}+\alpha_L} \tag{5}$$

t_i: Level of protection in industry i.

e_i: Import elasticity in industry i.

X_i: Domestic output of industry i.

M_i: Imports into industry i.

I_i: Dummy variable which is equal to 1 if the industry is organised and equal to zero if it is not.

β: captures the weight of welfare in the government's objective function.

$\alpha_L = \sum_{i\epsilon L}\alpha_i$. α_i is the fraction of the population that own a specific factor i. L is a subset of all the industries in the economy; industries that are in L have lobby and are organised ($I_i = 1$).

[19]The error term, ϵ_i, is not actually part of the first order condition. It has been included here because this same equation is the econometric specification.

Note: this is not the only specification that is possible for the GH model. For example the elasticity term could be on the right hand side or the output import ration could have been brought to the left hand side. To check for sensitivity I try the specification where the elasticity is entered on the right hand side; which is the way that Bown and Tovar (2010) estimate their model.

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ϵ_i: Random error term that accounts for what is not explained by the model.

The model tells us that if a sector is organised then protection is increasing in output and decreasing in imports. This is because owners of the specific factor have more to gain from a higher price and there is less to lose from protection if the volume of imports is low. Secondly, the higher the import elasticity the lower the protection. This is because there is more deadweight loss from protection when the import elasticity is higher (Goldberg and Maggi, 1999). The theory thus predicts a negative sign on γ and a positive sign on in the estimation that follows. The next section briefly reviews the data that is of specific importance to the GH estimation.

4.2 Data

4.2.1 Tariffs and antidumping

The level of trade protection in the economy is obviously of central importance to this paper. I use measures of tariffs, AD, ad valorem equivalents of the AD duties and a combination of tariffs and AD ad valorem equivalents. The database is aggregated to the 6 digit level and the average tariff on each harmonised system (HS) 6-digit product is used a dependent variable in the GH model. Ad valorem equivalents of the AD duties were constructed using the duty specified by the ruling from each case. The AD database gives both a maximum and minimum applied duties for each case; for sensitivity both of these levels were used in construction of the AD ad valorem equivalents[20]. In order to look at the total level of protection in the SA economy I summed the tariff and ad valorem AD duty together and used this composite measure[21].

4.2.2 Industry Data and Elasticities

Output and industry organisation variables are obtained from the industry database, which was described earlier. Estimates of the South African import elasticity's were constructed by Kee, Nicita and Olarreaga (2008) from the Wold Bank.

[20] Only the final duties were used. Ad valorem rates overcome the problem of using coverage ratios, as pointed out by Goldberg and Maggi (1999).

[21] This summation is possible because the trade, tariff and AD database varies by product, country and year. Thus each AD and or tariff applies to a particular country and a specific import value and thus there is no need to weight each duty by the imports from the relevant country as Bown and Tovar (2010) do.

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4.2.3 Industry Organisation

As was noted earlier campaign contributions are likely to influence government's decision in granting protection. Furthermore they are a good proxy for how well a sector is organised. If a sector is well organised it is more likely to be able to group together and offer up a campaign contributions to government. It is for these reasons that campaign contributions data is one of the crucial variables in the GH model and is usually used as the industry organisation variable (Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000). Since this data is unavailable in SA we follow Holden and Casale(2002) in using measures which explain what level of influence a sector may have on government to substitute for political contributions in the organisation variable. Using different measures not only ensures that the estimation procedure is consistent but it allows the invesigation of the changing political economy aspect of trade protection. This is because by changing these organisation variables I am effectively testing how government and industry interact in market for protection and whether this is different over time.

Three different types of organisation dummy variables are constructed. First, concentration ratios are used to construct a dummy variable with cut-offs at 60%, 70% and 80% levels of concentration. All three of the levels are tested in the analysis. This variable should capture the idea that concentrate sectors are more likely to organise and thus be able to politically influence government.

Secondly, principle component analysis is used to draw out the central information out of a few different variables[22]. Two different versions of the principle component variable are used: first with the number of firms, the concentration ratio and the level of employment and secondly with the concentration ratio, the level of capital and the share of unskilled workers. The motivation behind these is that perhaps it is not just one factor that influences governments' decision to award protection to industry. As has been mentioned, there are four main drivers of influence of industry on government. This method captures a mix of those factors.

Lastly, the Department of Labour provided data from the bargaining councils in SA; which includes information on unionisation from specific industries in South Africa. While this data was highly aggregated and could thus not be used directly, a dummy variable was created which indicates whether or not an industry has a bargaining council. This is a good representation that those industries had an avenue to express their economic desires to government and thus are more organised.

[22]Principle Component Analysis (PCA) is a statistical technique that allows us to derive the 'principle components' from a number of different variables. Each principle component is the weighted average of the underlying variables. The technique behind PCA uses eigenvalues and eigenvectors to choose weights which accounts for the maximum amount of the variance of the underlying variables (Shepherd, 2009).

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In the GH estimation just the 60% concentration ratio dummy is reported. However the other measures are used to verify the robustness of the results and investigate the political economy dimension on the market for endogenous protection.

4.3 Estimation Technique

The dependent variable in the GH model is the level of protection in the economy and is censored below zero. The explanatory variables, output, imports and in some cases elasticity, are endogenously determined. Like Bown and Tovar (2010) an instrumental variables (IV) Tobit two step procedure is used to deal with this endogeneity[23]. This entails using ordinary least squares to regress both of the endogenous explanatory variables from the GH model on a set of controls, then including the predicted values from this auxiliary regression in the GH model as the explanatory variables.

I try to control for the factors which may affect the level of imports and output in South Africa. This includes: the number of employees and firms, the ratio of white to black workers, the level of capital and output, the ratio of skilled to unskilled workers and concentration ratios. When the concentration ratios are used as the organisation variable then they are not included as controls. When instrumenting, both the level and the square of each term are included to ensure that all of the structural variation is controlled for (Bown and Tovar, 2010; Gawande and Bandyopadhyay, 2000 and Gawande et al., 2005). Due to constraints on the length of this paper these first stage regressions are presented in the appendix in tables 13, 14 and 15.

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4.4 Objective and Strategy

The estimation strategy endeavours to help answer to the two main goals of this paper. The first part is to see whether there is substitution between tariffs and AD and the secondary aspect is to describe the political economy dimension of this relationship.

The strategy followed is similar to Bown and Tovar (2010). They conduct three main GH estimations in their investigation of India. The first is prior to liberalisation where, just using tariffs as the protection measure, the GH model fits the political economy of trade well. The second regression is after significant liberalisation. When using just tariffs as the protection measure the GH model does not fit well. However when they use both tariffs and AD duties combined the model again fits the Indian data well. Bown and Tovar (2010) argue that this

[23]This is a combination of the approaches of Smith and Blundell (1986) and Kelejian (1971).

implies that in the post liberalisation period India used AD as strategic domestic industry protection so as to substitute for tariff liberalisation (Bown and Tovar, 2010). They conclude that this provides evidence that there is substitution from tariffs to AD in India.

To investigate substitution between tariffs and AD in South Africa GH estimations are conducted in a similar fashion; with both tariff and AD protection measures individually and then again with a combined tariff and AD measure. I investigate whether the significant liberalisation that was undertaken in South Africa in the 1990's means tariffs are exogenously determined in the political economy and whether AD becomes the endogenously determined trade remedy which is substituting for the tariff liberalisation. The findings are that there is no substitution. This is because the political economy interaction between government and industry explains the structure of both tariffs and AD in South Africa.

The secondary, political economy dimension, goal is investigated in the sensitivity analysis section. Different measures of the political organisation variable are tested in different periods to see whether the mechanism through which government and industry interact is changing over time.

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4.5 Results

4.5.1 Substitution between Tariffs and Antidumping

The first question here is 'does the political economy of trade explain the structure of tariff protection prior to liberalisation?' I investigate this relationship in South Africa prior to significant liberalisation by estimating the GH model in 1993. Thereafter I continue to apply this same model to the periods after 1993 to see if the same relationship applies over time. This is important because then we will know if the political economy dynamic for tariffs is consistent over time[24].

The results, with tariffs as the protection measure, are presented as table 5. It is important to note a couple of things. Firstly, the formulation of this GH model causes the coefficients to be very small. To increase the output to import ratio by one unit implies doubling output

[24]The table shows the periods over which the regression is run quite clearly: in 1993, 1996, then again in 1996 but with the 1993 industry data. I impose a similar estimation for 1999 with 1996 industry data. Since the Manufacturing Census data is only available for 1993 and 1996, from 1997 onwards I continue to use the 1996 industry characteristics. However the model is still estimated in 2004 and 2008. In these regressions, after 1996, sales data is used to proxy for output data. This is done purely because sales data is available after 1996 and thus allows us greater variation in the data. It can be seen on the LHS of the table that sales "(sales)" is used instead of output.

Table 5: GH models with tariffs in different time periods

Dependant var: (tar/(1+tar))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	1993	1996	1996 with 1993 industry data	1999 with 1996 industry data	1999 with 1996 industry data	2004 with 1996 industry data	2008 with 1996 industry data
output import ratio	1.12e-08***	-1.21e-08***	1.91e-08***	-2.07e-08***			
	(2.45e-09)	(1.17e-09)	(5.04e-09)	(2.66e-09)			
out_imp ratio * Org Dummy	3.65e-08***	4.91e-08***	4.21e-08***	8.20e-08***			
	(3.57e-09)	(2.02e-09)	(6.42e-09)	(5.13e-09)			
output (sales) import ratio					-2.26e-06***	-3.16e-08***	-1.49e-08***
					(3.93e-07)	(4.25e-09)	(4.52e-09)
out(sales)_imp ratio * Org Dummy					4.56e-06***	1.68e-07***	4.32e-08***
					(5.29e-07)	(5.65e-09)	(6.21e-09)
Constant	-0.153***	-0.393***	-0.553***	-0.839***	-0.817***	-0.532***	-0.708***
	(0.0216)	(0.0144)	(0.0371)	(0.0343)	(0.0546)	(0.0156)	(0.0230)
Observations	41,023	48,934	31,564	34,260	50,098	72,720	75,860
Standard errors in parentheses							
*** p<0.01, ** p<0.05, * p<0.1							

Note1: Each column represents a regression in a different time period, which is specified at the top of each column. Regression 3&4 are different to 1&2 because the explanatory variables are lagged by three years. Regressions 6&7 are different to 3&4 because I use sales data instead of output data in these later regressions because it is available. We will see this pattern throughout the regression results presented in the rest of this paper.
Note2: The independent variables are specified on the left of the table.

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relative to imports which is a large amount. Furthermore the formulation of the dependant variable, $\frac{t_i}{1+t_i}$, causes it to be measured in small amounts itself. Thus the reader need not be alarmed by the small coefficients. Secondly, these results and those in output 3 and 4 use the concentration ratio as the organisation variable. Organised industries are those that have above 60% concentration.

These results provide support for the GH model. The coefficients in table 5 are generally of the sign that expected; positive on the $I_i \frac{X_i}{M_i}$ variable and negative on $\frac{X_i}{M_i}$. This implies that more organised sectors, or more concentrated sectors in this case, receive more protection in tariffs than unorganised sectors do (Bown and Tovar, 2010). This is consistent across the different time periods suggesting that the political economy of trade protection explains the structure of tariff protection over time. The sum of the two coefficients is positive in all the regressions which adds support to the model.

Finding that this particular model is consistent over time is contrary to what Bown and Tovar (2010) find in India during the 1990's. The results here suggest that tariffs are not exogenously determined in South Africa during the liberalisation period of the 1990's and 2000's. This point I will return to later.

It is now informative to determine if the political economy of trade according to Grossman-

Helpman explains the structure of AD protection. Once again, I estimate this model in 1993 and multiple periods afterwards. These regressions show the relationship between government and industry over AD over time. The results are presented below in table 6.

Table 6: GH models with antidumping in different time periods

D var: (ad_eq/(1+ad_eq))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	1993	1996	1996 with 1993 industry data	1999 with 1996 industry data	1999 with 1996 industry data	2004 with 1996 industry data	2008 with 1996 industry data
output import ratio	-1.66e-07	-2.37e-06**	2.10e-07	-7.04e-07			
	(1.59e-07)	(1.14e-06)	(1.63e-06)	(1.24e-06)			
out_imp ratio * Org Dummy	-4.56e-05	-1.29e-05*	7.88e-07	-1.97e-06			
	(6.27e-05)	(7.39e-06)	(2.37e-06)	(1.53e-06)			
output (sales) import ratio					-9.52e-06	-1.26e-06***	-2.53e-07***
					(5.28e-05)	(9.39e-08)	(7.44e-08)
out(sales)_imp ratio * Org Dummy					2.74e-05	-0.00126***	2.53e-07
					(6.44e-05)	(0.000178)	(1.54e-07)
Constant	0.477*	2.650***	1.263**	1.185***	0.940***	0.574***	0.482
	(0.247)	(0.842)	(0.613)	(0.346)	(0.359)	(0.215)	(0.395)
Observations	18	52	50	98	97	86	52
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1							

Note1: Each column represents a regression in a different time period, which is specified at the top of each column. Regression 3&4 are different to 1&2 because the explanatory variables are lagged by three years. Regressions 6&7 are different to 3&4 because I use sales data instead of output data in these later regressions because it is available. We will see this pattern throughout the regression results presented in the rest of this paper.

During 1993 and 1996 the GH model fits badly. This could be due to the fact that AD cases have not been put into use yet and thus there are few observations for the estimation. Thereafter many of the coefficients for the GH model are of the correct sign. However most of the coefficients are insignificant. This either implies that the political economy of trade protection does not fit the structure of AD protection across time very well or that there continues to be a lack of data.

To investigate which of these options is true it is informative to conduct the GH model with tariff and AD rates combined as the measure of protection. This estimation will show if the government industry interaction in the political economy of trade protection can better explain the combined rate of protection than tariffs exclusively.

When both tariffs and AD are combined together the GH model fits well. This implies that the political economy of trade protection is explaining the structure of tariff and AD protection. Most of the coefficients are of the correct sign which implies that more organised sectors, or more concentrated sectors in this case, receive more protection than unorganised sectors do. The result is also consistent over time which suggests that the political economy of trade protection is applicable and that it explains the combined level of protection in South Africa.

Table 7: GH model with a combination of AD and tariffs in different time periods

D var: (tar_ad/(1+tar_ad))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	1993	1996	1996 with 1993 industry data	1999 with 1996 industry data	1999 with 1996 industry data	2004 with 1996 industry data	2008 with 1996 industry data
output import ratio	1.30e-08***	-1.15e-08***	2.35e-08***	-2.11e-08***			
	(2.51e-09)	(1.19e-09)	(5.26e-09)	(2.77e-09)			
out_imp ratio * Org Dummy	3.80e-08***	4.95e-08***	4.26e-08***	8.47e-08***			
	(3.66e-09)	(2.06e-09)	(6.69e-09)	(5.33e-09)			
output (sales) import ratio					-2.40e-06***	-3.93e-08***	-1.94e-08***
					(4.15e-07)	(6.28e-09)	(5.41e-09)
out(sales)_imp ratio * Org Dummy					4.75e-06***	2.49e-07***	6.29e-08***
					(5.58e-07)	(8.34e-09)	(7.45e-09)
Constant	-0.0944***	-0.345***	-0.523***	-0.855***	-0.826***	-0.729***	-0.736***
	(0.0221)	(0.0147)	(0.0387)	(0.0356)	(0.0577)	(0.0230)	(0.0274)
Observations	41,023	48,934	31,564	34,260	50,098	72,720	75,860

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This set of three results suggests that, as expected, the South African situation is quite different to that of the Indian. In South Africa the political economy explains protection throughout the 1990's and 2000's; both when tariffs and a combination of tariffs and AD are used as the protection measure. The GH model results advise that tariffs are not exogenously determined in any of the periods and that the model fits even better once AD duties are included. These results seem to suggest that perhaps there was not particularly strong direct substitution from tariffs to AD but rather that they both being used as a strategic protection measure.

4.5.2 Sensitivity to different organisation dummies

The second goal of the estimation strategy is to investigate the political economy determinants behind AD protection in South Africa; to examine whether business or social welfare factors are driving decisions in the protection process and to test whether these relationships are stable over time. This is done by testing whether the results are robust to changes in the organisation variable which is effectively changing the structure through which industry and government interact.

For all regressions over all periods different formulations of the political organisation variable are used in order to understand what is driving political organisation of industries within the manufacturing sector in South Africa. As discussed earlier different levels of industry concentration (60%, 70% and 80%), levels of unionisation and a combination of different factors within principle component analysis (PCA) are all used. The two different combinations of the

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PCA variable are: first with the number of firms, the concentration and the level of employment and secondly with concentration, the level of capital and the share of unskilled workers.

Due to the space limitations I have only displayed the results for the three different periods: 1999 with 1996 industry data, 2004 with 1996 industry data and 2008 with 1996 industry data. Furthermore I have only displayed the results for the regressions with tariffs as the protection measure. The complete results are presented in the appendix in tables 16, 17 and 18. They confirm the same observations that one can make from the results in table 8 above.

These regressions indicate that the results are relatively robust to the choice of concentration ratio; results for all three of the cut-off levels, 60%, 70% and 80%, are significant. However the results are sensitive to change of organisation dummy away from the concentration ratios. Neither the unionisation (bargaining council) dummy nor either of the principle component analysis dummies is consistent. The signs of the coefficients on these dummies variables change frequently which is inconsistent with the theory. This result implies that unionisation is perhaps not an important factor in political economy of trade protection and that perhaps trying to combine the information from multiple sources so as to proxy for political organisation does not work.

While this does highlight that the results are sensitive it is insightful that only by using industry concentration as the structure through which industry effects government am I able to get the political economy of trade to explain the level of protection in South Africa.

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4.5.3 Sensitivity to different specifications

There remains some concern over the consistency of the results that have been displayed thus far. Furthermore there has been disagreement in the literature as to what the best specification is for the GH model. I thus test the other common specification of the GH model in order to check whether the results are consistent and if they are sensitive to specification. The way in which the results have been presented so far; where the elasticity is divided through on the explanatory variables is the method advocated by Goldberg and Maggi (1999). The second method is where the elasticity is rather multiplied onto the independent variables for the first step of the estimation (Bown and Tovar, 2010). In this second specification the elasticity can also be instrumented for to control for the endogeneity. I control for it by using data from Canada, Australia and Brazil as these are similar to SA in that there exports are largely commodity driven. An average elasticity of the Canadian, Australian and Brazilian elasticities was created for each HS6 digit product so as to instrument for the South African elasticities.

A simplified version of the results has been displayed in table 9: just looking at the relationship to tariffs and no variation in the organisation variable. While there are coefficients that are insignificant in column 2, 5 and 6, on the whole these results are very similar to those in table 5. This confirms that the main results presented in section 4.5.1 are consistent. However they are sensitive because many of the coefficients do become insignificant which would imply that the political economy of trade protection is not explaining the structure of protection in the economy.

4.6 Summary of Results

These Grossman-Helpman results do not provide evidence of substitution between tariffs and AD. They advocate that both tariffs and AD are explained within the GH framework for endogenous protection and that, unlike to Indian case, tariffs do not become exogenous to the trade protection framework. This suggests that both tariffs and AD are used strategically within the South Africa economy to afford protection to certain chosen sectors.

When using variables other than the concentration ratios the results are inconsistent with theory. While this outcome does suggest that the results are relatively sensitive it also implies that there must be something about the industry concentration that is consistent with the political economy of trade protection in South Africa. This might relate to the strength of industrial lobbying in South Africa.

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5 Conclusion

SA undertook a trade policy transformation during the 1990's. Not only were there different periods of trade liberalisation during the 1990's (WTO, EU and SADC trade negotiations) but there was a political transition from the apartheid government to the democratically elected ANC. This provides an interesting political economy framework. The result for South Africa's trade regime from this period of transformation was a dramatic decline in the use of tariffs and an increase in the use of AD. In this paper I investigate whether there is relationship between this movement in tariffs and AD. Additionally I consider whether the period of transition has implications for trade policy which historically is dominated by the interests of big business.

I find that there is a strong relationship between the AD and tariffs in South Africa, panel data regressions provide evidence of this. However from closer investigation of the South Africa data I find that the relationship between the two is not clear cut substitution from one form of

protection to the other. There is a complementary relationship between tariffs and AD in that AD is perhaps being used to reinforce tariff protection. Furthermore the panel data regressions show that higher tariffs and higher liberalisation are both significantly related to higher levels of AD protection. Thus while there has been movement from tariffs to AD it does appear that there is direct substitution from one to other.

Findings from the GH model are consistent with the panel data regressions. The results suggest that AD is not used as a substitute for tariffs.. Rather that the domestic political economy factors explain the structure of both tariffs and AD in South Africa. This implies that both tariffs and AD are being used to offer protection to strategic sectors.

The secondary goal of this paper, the investigation of the political economy relationship of trade reform, provides an interesting accompaniment to the tariff AD examination. While it was expected that the change of government and of political constituency might influence the political economy dynamic this is not the case in South Africa. Panel data regressions hinted that a higher the level of capital, lower level of employment and higher concentration are more related to higher AD protection. It must be noted that there was some variation in the results over time and that a few social welfare determinants did pick up some levels of significance, like the number of black and unskilled workers. However these social welfare aspects were certainly not the crucial factors which were related to AD protection. Rather the panel data regression results lean towards the idea that big business lobbies for trade protection in South Africa. This idea is confirmed by the findings of the GH model because concentration is the only form of organisation that induces the political economy factors to explain the structure of protection to any reasonable standard. Furthermore the fact that the political economy factors in South Africa explain the structure of both tariff and AD protection suggests that there is a consistent mechanism which is explaining the political economy of trade protection in South Africa over time, namely concentrated industries. This result suggests that industry is lobbying as usual for protection in the South African political economy of trade.

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APPENDIX

Table 8: GH models checking sensitivity to organisation dummies

Dvar: (tar/(1+tar))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	1999 with 1996 industry data					2004 with 1996 industry data					2008 with 1996 industry data				
VARIABLES	cr70	cr80	pca	pca2	barg	cr70	cr80	pca	pca2	barg	cr70	cr80	pca	pca2	barg
output (sales) import ratio	-1.61e-06***	-1.03e-06***	-7.58e-07**	-3.30e-07	2.66e-06**	-1.25e-08***	4.31e-08***	7.06e-08***	7.71e-08***	3.57e-08***	2.68e-09	-2.32e-08***	1.11e-08***	1.39e-08***	5.54e-08***
	(3.24e-07)	(3.02e-07)	(3.38e-07)	(6.58e-07)	(1.10e-06)	(4.25e-09)	(5.44e-09)	(5.97e-09)	(5.06e-09)	(3.15e-09)	(4.01e-09)	(3.58e-09)	(3.98e-09)	(4.23e-09)	(1.17e-08)
out_imp (sales) *cr70	3.24e-06***					1.74e-07***					-1.77e-09				
	(4.42e-07)					(6.91e-09)					(7.11e-09)				
out_imp (sales) *cr80		2.33e-06***					1.18e-07***					8.71e-07***			
		(4.18e-07)					(1.49e-08)					(2.11e-08)			
out_imp (sales) *pca			1.95e-07					1.27e-08					-2.37e-08***		
			(1.39e-06)					(1.09e-08)					(5.27e-09)		
out_imp (sales) *pca2				-4.92e-07					-3.48e-08***					-2.54e-08***	
				(6.04e-07)					(5.35e-09)					(4.33e-09)	
out_imp (sales) *barg					-1.48e-06***					2.38e-09*					-2.82e-08***
					(3.54e-07)					(1.43e-09)					(6.66e-09)
Constant	-0.808***	-0.800***	-0.824***	-0.779***	-1.015***	-0.572***	-0.746***	-0.891***	-0.804***	-0.603***	-0.721***	-0.758***	-0.800***	-0.750***	-1.094***
	(0.0472)	(0.0470)	(0.0567)	(0.0488)	(0.126)	(0.0161)	(0.0209)	(0.0283)	(0.0196)	(0.0139)	(0.0215)	(0.0221)	(0.0236)	(0.0220)	(0.0626)
Observations	50,098	50,098	50,098	50,098	50,098	72,720	72,720	72,720	72,720	72,720	75,860	75,860	75,860	75,860	75,860

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: GH model checking sensitivity to different specifications

D var: tar/(1+tar)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1993	1996	1996 with 1993 industry data	1999 with 1996 industry data	1999 with 1996 industry data	2004 with 1996 industry data	2008 with 1996 industry data
output import ratio / ε	-1.18e-09***	-3.11e-10***	-1.07e-09***	-2.10e-10***			
	(1.31e-10)	(8.43e-11)	(1.29e-10)	(8.01e-11)			
(out_imp ratio * Org Dummy) / ε	2.67e-09***	2.39e-09	3.71e-09***	8.59e-09*			
	(8.05e-10)	(2.16e-09)	(8.61e-10)	(4.57e-09)			
output(sales) import ratio / ε					-4.23e-08***	-9.98e-09***	-2.23e-09**
					(1.13e-08)	(1.19e-09)	(1.10e-09)
out(sales)_imp ratio * Org Dummy) / ε					3.72e-08	1.23e-08***	3.07e-09
					(6.21e-08)	(1.22e-09)	(2.05e-09)
Constant	0.0900***	0.0591***	0.0515***	0.0119	0.0284**	0.0176***	-0.0196**
	(0.00458)	(0.0128)	(0.00480)	(0.0162)	(0.0141)	(0.00590)	(0.00914)
Observations	40,496	48,311	31,182	33,851	49,445	71,806	74,961
Standard errors in parentheses							
*** p<0.01, ** p<0.05, * p<0.1							

Note1: ε stands for elasticity
Note2: The organisation dummy used in these regressions is the CR4 ratio at the 60% cut-off

Table 10: LPM of AD cases with different dependent variable (similar to table 3)

	If duty in place; either preliminary or final			
VARIABLES	(5) whole period	(6) 1992-1995	(7) 1996-2000	(8) 2001-2009
lagltar	0.00471***	0.00371	0.0272***	0.00430**
	(0.00155)	(0.00422)	(0.00827)	(0.00193)
lagdltar	-0.00326**	0.00314*	-0.0206***	-0.00210
	(0.00162)	(0.00187)	(0.00790)	(0.00131)
laglrer	0.000291	0.00541	0.00406	0.00108
	(0.000925)	(0.00332)	(0.00271)	(0.000741)
lagdlrer	-0.000737	3.10e-05	0.000187	-0.00125**
	(0.000718)	(0.00120)	(0.00235)	(0.000514)
Dformula	-0.00151***	-4.75e-06	-0.00780**	-0.000770**
	(0.000449)	(3.43e-05)	(0.00355)	(0.000366)
laglimports	-2.70e-06	-0.000187	0.000325	3.34e-05
	(8.43e-05)	(0.000215)	(0.000198)	(7.66e-05)
lagdlimports	-7.16e-05	0.000165	-0.000170	-5.04e-05
	(4.73e-05)	(0.000127)	(0.000124)	(4.21e-05)
laglsales	-0.000255	0.0541***	-0.00151	-0.00125*
	(0.000579)	(0.0158)	(0.00102)	(0.000749)
lagdlsales	0.00154**	-0.0294***	0.00175**	0.00294***
	(0.000695)	(0.00801)	(0.000733)	(0.000846)
Constant	0.00564	-0.893***	0.0234	0.0242*
	(0.00936)	(0.261)	(0.0166)	(0.0126)
controll for time variation				
Observations	595,863	46,760	137,469	411,634
R-squared	0.001	0.005	0.002	0.001
Number of id	79,891	25,751	41,771	75,085
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Table 11: Probit on AD cases with different dependent variable (similar to table 4)

	If duty in place; either preliminary or final			
VARIABLES	(5) whole period	(6) 1992-1995	(7) 1996-2000	(8) 2001-2009
lagltar	1.838***	1.046***	1.793***	2.312***
	(0.0711)	(0.202)	(0.114)	(0.115)
lagdltar	-0.646***	-0.741	0.383	-1.066***
	(0.232)	(0.495)	(0.427)	(0.292)
laglrer	0.0474***	0.0184	0.0369***	0.0513***
	-0.00256	(0.0123)	(0.00461)	(0.00327)
lagdlrer	-0.100	-0.184	0.0462	-0.211***
	(0.0687)	(0.421)	(0.131)	(0.0810)
Dformula	0.0740***	0.0528***	0.268***	
	(0.0102)	(0.0137)	(0.0368)	
cr4e	0.160***	-1.097***	0.282***	0.143***
	(0.0377)	(0.294)	(0.0657)	(0.0485)
L.cap	1.51e-10***	2.22e-10***	1.70e-10***	1.49e-10***
	(0)	(0)	(0)	(0)
L.empl	-1.49e-05***	-1.33e-05***	-1.69e-05***	-1.45e-05***
	(7.28e-07)	(3.81e-06)	(1.49e-06)	(8.18e-07)
D.lgout	0.0408***	0.0180	0.0470***	0.0425***
	(0.00802)	(0.0238)	(0.0168)	(0.00961)
wht_blk	-0.137***	-0.0169	-0.137***	-0.144***
	(0.0208)	(0.0626)	(0.0343)	(0.0289)
unsk_wshare	0.340***	-1.113***	0.233**	0.446***
	(0.0557)	(0.331)	(0.0950)	(0.0735)
Constant	-3.299***	-1.831***	-2.864***	-3.402***
	(0.0581)	(0.299)	(0.0796)	(0.0703)
controlls for time variation				
Observations	608,302	52,249	150,377	405,485
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Table 12: LPM of AD cases for sensitivity- looking at cross-sectional correlations (similar to table 4)

	Liner Probability Model							
	If AD case existed on that line				If duty in place; either preliminary or final			
VARIABLES	(9) whole period	(10) 1992-1995	(11) 1996-2000	(12) 2001-2009	(13) whole period	(14) 1992-1995	(15) 1996-2000	(16) 2001-2009
lagltar	0.0170***	0.00301**	0.0193***	0.0237***	1.837***	1.047***	1.788***	2.312***
	(0.000923)	(0.00135)	(0.00181)	(0.00163)	(0.0711)	(0.202)	(0.114)	(0.115)
lagdltar	-0.0111***	-0.00157	-0.00231	-0.0146***	-0.645***	-0.741	0.387	-1.065***
	(0.00303)	(0.00308)	(0.00560)	(0.00442)	(0.232)	(0.495)	(0.427)	(0.292)
laglrer	0.000575***	0.000101	0.000537***	0.000596***	0.0474***	0.0184	0.0369***	0.0513***
	(3.72e-05)	(6.43e-05)	(7.45e-05)	(4.65e-05)	(0.00256)	(0.0123)	(0.00462)	(0.00327)
lagdlrer	-0.00193**	-0.000765	0.000308	-0.00325***	-0.101	-0.184	0.0458	-0.212***
	(0.000771)	(0.00147)	(0.00238)	(0.000774)	(0.0687)	(0.421)	(0.131)	(0.0809)
Dformula	0.000332	0.000214	0.00380	-0.00313***	0.0740***	0.0528***	0.269***	
	(0.000205)	(0.000147)	(0.00239)	(0.000219)	(0.0102)	(0.0137)	(0.0368)	
cr4c	0.00140***	-0.00270***	0.00290***	0.000899*	0.162***	-1.098***	0.286***	0.144***
	(0.000393)	(0.000719)	(0.000919)	(0.000478)	(0.0377)	(0.294)	(0.0656)	(0.0484)
L.cap	0***	0***	0***	0***	1.51e-10***	2.22e-10***	1.69e-10***	1.49e-10***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
L.empl	-1.09e-07***	-5.71e-08***	-1.56e-07***	-1.16e-07***	-1.48e-05***	-1.34e-05***	-1.68e-05***	-1.45e-05***
	(6.17e-09)	(1.73e-08)	(1.82e-08)	(7.61e-09)	(7.28e-07)	(3.81e-06)	(1.48e-06)	(8.18e-07)
D.lgout	0.000336***	-1.36e-05	0.000541**	0.000272**	0.0408***	0.0181	0.0469***	0.0425***
	(0.000101)	(9.70e-05)	(0.000264)	(0.000120)	(0.00802)	(0.0238)	(0.0167)	(0.00962)
wht_blk	-0.000648***	0.000270	-0.000846***	-0.000611***	-0.137***	-0.0167	-0.138***	-0.144***
	(0.000118)	(0.000171)	(0.000262)	(0.000154)	(0.0208)	(0.0626)	(0.0343)	(0.0288)
unsk_wshare	0.00454***	-0.00265*	0.00308***	0.00500***	0.342***	-1.112***	0.234**	0.447***
	(0.000483)	(0.00139)	(0.00105)	(0.000555)	(0.0557)	(0.332)	(0.0950)	(0.0734)
Constant	-0.00347***	0.00385***	0.000258	9.54e-05	-3.301***	-1.832***	-2.866***	-3.404***
	(0.000496)	(0.000948)	(0.000929)	(0.000607)	(0.0502)			(0.0505)
controlls for time variation								
Observations	608,302	52,249	150,377	405,676	608,302	52,249	150,377	405,485

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

Table 13: First Stage Regressions

VARIABLES	(1) out_imp * cr60	(2) out_imp *cr70	(3) out_imp *cr80	(4) out_imp *pca	(5) out_imp *pca2	(6) out_imp *barg	(7) out_imp
	1993						
cr4e				-2.569e+07	1.803e+07	-1.588e+07	
				(2.082e+07)	(1.117e+07)	(2.752e+07)	
cr4_2				2.169e+07	-1.493e+07	820,390	
				(1.620e+07)	(1.021e+07)	(2.132e+07)	
empl	62.82	-192.5	155.3**	150.6	508.6	705.5*	1,867***
	(423.0)	(245.9)	(78.72)	(284.8)	(426.0)	(375.2)	(652.9)
empl_2	-0.000481	0.00198	-0.00141	0.00156	-0.00565	-0.00688	-0.0221***
	(0.00380)	(0.00255)	(0.000884)	(0.00418)	(0.00386)	(0.00421)	(0.00805)
firms	-11,655	3,021	-12,047***	3,510	-9,373	-34,081*	-38,185
	(21,386)	(10,981)	(4,046)	(11,992)	(22,577)	(18,763)	(24,975)
firms_2	8.663	-0.0256	7.114***	-7.088*	3.983	13.95	9.350
	(11.53)	(5.377)	(2.130)	(3.948)	(12.10)	(9.391)	(12.67)
wht_blk	4.094e+06	3.676e+06	-3.174e+06***	531,012	-8.467e+06*	-3.474e+06	-6.430e+06
	(4.484e+06)	(4.007e+06)	(850,858)	(559,836)	(4.916e+06)	(5.654e+06)	(5.085e+06)
wht_blk_2	-564,026	-541,090	519,160***	-104,491	1.470e+06*	640,864	1.146e+06
	(705,956)	(828,317)	(129,911)	(107,904)	(806,897)	(937,624)	(820,108)
cap_output	-8.344e+07***	-2.458e+07	1.677e+07**	8.301e+06	1.484e+07	2.783e+07	-2.678e+07
	(3.194e+07)	(1.856e+07)	(7.302e+06)	(1.010e+07)	(2.205e+07)	(2.672e+07)	(3.502e+07)
cap_output_2	3.440e+07**	2.720e+06	-1.080e+07**	-3.950e+06	-2.587e+07**	-3.352e+07***	5.850e+06
	(1.505e+07)	(6.279e+06)	(4.414e+06)	(4.652e+06)	(1.076e+07)	(1.170e+07)	(1.726e+07)
cap_lab	314.9	87.71	-214.8**	-34.24	71.22	210.0	137.6
	(217.1)	(179.1)	(104.5)	(45.17)	(179.9)	(182.9)	(229.1)
cap_lab_2	9.08e-05	0.000580	0.00116**	4.39e-05	0.000548	-0.000199	0.000287
	(0.000653)	(0.000604)	(0.000537)	(6.42e-05)	(0.000605)	(0.000387)	(0.000663)
white_emplshare	-2.374e+07	-1.239e+07	3.568e+07***	6.412e+06	1.352e+07	-8.065e+06	-3.013e+07
	(4.547e+07)	(3.117e+07)	(1.355e+07)	(1.387e+07)	(4.097e+07)	(3.612e+07)	(4.751e+07)
white_emplshare_2	-4.250e+06	-1.252e+07	-4.224e+07**	-1.112e+07	4.822e+06	4.258e+07	7.044e+07
	(5.358e+07)	(2.593e+07)	(1.698e+07)	(2.238e+07)	(4.844e+07)	(3.602e+07)	(6.052e+07)
unsk_wshare	-4.646e+07	-3.763e+06	9.430e+06**	3.684e+07	-7.859e+07*	-4.570e+07*	4.744e+07
	(4.010e+07)	(6.949e+06)	(4.568e+06)	(2.604e+07)	(4.277e+07)	(2.679e+07)	(6.241e+07)
unsk_wshare_2	5.888e+07*	1.288e+07*	-5.987e+06	-2.976e+07	4.823e+07	2.637e+07	-3.552e+07
	(3.133e+07)	(7.757e+06)	(3.674e+06)	(2.154e+07)	(3.183e+07)	(2.212e+07)	(4.862e+07)
Constant	1.538e+07	1.454e+06	-5.051e+06***	-6.625e+06	2.116e+07	1.983e+07**	-1.073e+07
	(1.196e+07)	(3.422e+06)	(1.236e+06)	(4.481e+06)	(1.476e+07)	(9.543e+06)	(2.022e+07)
Observations	45,799	45,799	45,799	45,799	45,799	41,032	45,799
R-squared	0.005	0.007	0.008	0.002	0.006	0.004	0.004

VARIABLES	(8) out_imp * cr60	(9) out_imp *cr70	(10) out_imp *cr80	(11) out_imp *pca	(12) out_imp *pca2	(13) out_imp *barg	(14) out_imp
	1996						
cr4e				-4.188e+07**	9.043e+07	-9.977e+06	
				(1.950e+07)	(5.840e+07)	(4.144e+07)	
cr4_2				3.236e+07**	-6.234e+07	-6.785e+06	
				(1.488e+07)	(3.843e+07)	(3.534e+07)	
empl	-127.6**	-45.34	-15.24	1,103*	32.18	499.8*	1,660***
	(61.05)	(51.48)	(48.62)	(618.9)	(105.2)	(301.8)	(605.1)
empl_2	-0.00176	-0.000132	0.000460	-0.00892	-0.00304	-0.00456	-0.0191***
	(0.00189)	(0.000845)	(0.000616)	(0.00676)	(0.00284)	(0.00419)	(0.00685)
firms	6,965	-16,884***	-5,655**	-41,376	64,125	2,336	-21,971
	(16,775)	(3,851)	(2,484)	(25,633)	(45,151)	(23,900)	(26,880)
firms_2	-2.301	16.26***	5.025***	17.72*	-40.61	-19.18	-1.307
	(13.14)	(3.979)	(1.804)	(9.861)	(27.03)	(12.54)	(16.39)
wht_blk	-1.917e+07**	-7.576e+06*	-6.142e+06***	496,593	-835,430	2.379e+07***	-3.007e+06
	(9.124e+06)	(3.882e+06)	(1.946e+06)	(1.580e+06)	(9.179e+06)	(9.222e+06)	(1.021e+07)
wht_blk_2	1.174e+07**	3.452e+06**	2.906e+06***	-843,807	-1.156e+06	-1.164e+07**	419,966
	(5.770e+06)	(1.681e+06)	(971,144)	(960,084)	(5.227e+06)	(4.635e+06)	(6.363e+06)
cap_output	-9.259e+07***	-4.976e+07***	-2.665e+06	4.528e+07**	1.332e+07	2.192e+07	4.452e+07
	(3.160e+07)	(1.699e+07)	(3.915e+06)	(2.083e+07)	(3.313e+07)	(4.314e+07)	(4.511e+07)
cap_output_2	3.583e+07**	1.580e+07**	1.311e+06	-2.998e+07**	-4.423e+07**	-5.855e+07**	-6.886e+07**
	(1.497e+07)	(6.570e+06)	(3.368e+06)	(1.339e+07)	(1.954e+07)	(2.921e+07)	(2.727e+07)
cap_lab	297.6*	72.37	-102.6*	-134.7*	353.1**	475.3***	262.7
	(158.2)	(82.91)	(56.73)	(69.45)	(139.1)	(119.4)	(182.8)
cap_lab_2	-0.000167	0.000236	0.000502**	0.000169*	-0.000316	-0.000619**	-0.000250
	(0.000344)	(0.000247)	(0.000230)	(8.83e-05)	(0.000327)	(0.000253)	(0.000370)
white_emplshare	1.620e+07	4.506e+06	4.355e+07***	6.456e+07**	-1.052e+08**	-1.236e+08**	-5.073e+06
	(3.723e+07)	(3.708e+07)	(1.527e+07)	(2.921e+07)	(4.196e+07)	(5.612e+07)	(5.229e+07)
white_emplshare_2	-7.037e+07	1.447e+07	-7.032e+07***	-7.597e+07**	1.430e+08*	1.612e+08	-4.844e+06
	(7.734e+07)	(6.368e+07)	(2.372e+07)	(3.268e+07)	(7.618e+07)	(9.893e+07)	(9.177e+07)
unsk_wshare	9.279e+07***	5.168e+07*	-4.920e+06	4.929e+07**	-3.643e+07	-1.191e+08	3.341e+07
	(3.566e+07)	(2.784e+07)	(3.290e+06)	(2.515e+07)	(8.205e+07)	(9.948e+07)	(5.202e+07)
unsk_wshare_2	-6.697e+07**	-2.774e+07	6.820e+06***	-4.003e+07*	9.927e+06	9.044e+07	-4.316e+07
	(3.080e+07)	(2.047e+07)	(2.470e+06)	(2.089e+07)	(7.132e+07)	(7.934e+07)	(4.201e+07)
Constant	-1.718e+07***	-1.248e+07**	626,428	-1.586e+07**	-9.095e+06	4.019e+07	-1.425e+07
	(5.650e+06)	(5.556e+06)	(1.323e+06)	(7.950e+06)	(3.128e+07)	(2.494e+07)	(1.650e+07)
Observations	55,679	55,679	55,679	55,679	55,679	49,365	55,679
R-squared	0.003	0.005	0.007	0.003	0.004	0.003	0.003

Table 14: First Stage Regressions

	1996 with 1993			
	(15)	(16)	(17)	(18)
VARIABLES	out_imp * cr60	out_imp *cr70	out_imp *cr80	out_imp
cr4a				
cr4_2				
empl	-280.9	-202.8	199.6*	1,452**
	(330.1)	(323.4)	(107.8)	(673.4)
empl_2	0.00235	0.00200	-0.00196	-0.0170*
	(0.00338)	(0.00336)	(0.00119)	(0.00913)
firms	7,588	4,217	-13,336**	-22,980
	(14,848)	(14,511)	(5,484)	(21,325)
firms_2	-2.354	-0.839	7.554***	0.978
	(7.303)	(7.136)	(2.846)	(9.607)
wht_blk	5.974e+06	4.153e+06	-3.125e+06***	-1.233e+06
	(5.114e+06)	(4.995e+06)	(1.097e+06)	(5.460e+06)
wht_blk_2	-894,434	-634,272	488,499***	242,229
	(794,262)	(778,746)	(161,259)	(860,869)
cap_output	-6.954e+07*	-2.518e+07	2.051e+07**	-1.288e+07
	(3.581e+07)	(2.491e+07)	(1.034e+07)	(3.882e+07)
cap_output_2	2.388e+07	2.047e+06	-1.276e+07**	-3.152e+06
	(1.522e+07)	(8.637e+06)	(6.186e+06)	(1.694e+07)
cap_lab	285.9	74.97	-261.3*	76.78
	(269.1)	(238.1)	(142.1)	(283.6)
cap_lab_2	0.000273	0.000710	0.00136*	0.000539
	(0.000846)	(0.000806)	(0.000720)	(0.000858)
white_emplshare	-4.691e+07	-1.416e+07	3.952e+07**	-3.816e+07
	(4.527e+07)	(4.025e+07)	(1.812e+07)	(4.843e+07)
white_emplshare_2	2.961e+07	-1.232e+07	-4.706e+07**	1.008e+08*
	(4.338e+07)	(3.397e+07)	(2.249e+07)	(5.434e+07)
unsk_wshare	-1.286e+07	-1.024e+07	7.332e+06*	1.159e+08**
	(9.167e+06)	(9.050e+06)	(3.826e+06)	(5.346e+07)
unsk_wshare_2	3.166e+07**	1.745e+07	-5.379e+06*	-8.726e+07**
	(1.290e+07)	(1.064e+07)	(2.999e+06)	(4.363e+07)
Constant	6.157e+06	4.095e+06	-4.252e+06***	-3.098e+07*
	(4.814e+06)	(4.723e+06)	(1.158e+06)	(1.831e+07)
Observations	35,215	35,215	35,215	35,215
R-squared	0.006	0.007	0.008	0.005

	1999 with 1996			
	(19)	(20)	(21)	(22)
VARIABLES	out_imp * cr60	out_imp *cr70	out_imp *cr80	out_imp
cr4a				
cr4_2				
empl	-126.2*	-56.51	-40.10	2,075**
	(72.78)	(64.27)	(61.29)	(931.3)
empl_2	-0.00216	0.000545	0.000729	-0.0245**
	(0.00270)	(0.000832)	(0.000774)	(0.0106)
firms	20,818	-9,353***	-4,120	-24,000
	(21,592)	(3,169)	(2,950)	(38,112)
firms_2	-14.48	9.023***	3.997*	-6.656
	(16.72)	(2.611)	(2.133)	(21.63)
wht_blk	-2.567e+07**	-8.067e+06***	-5.742e+06**	-1.268e+07
	(1.292e+07)	(2.996e+06)	(2.552e+06)	(1.401e+07)
wht_blk_2	1.569e+07*	3.758e+06***	2.765e+06**	5.068e+06
	(8.321e+06)	(1.422e+06)	(1.270e+06)	(8.948e+06)
cap_output	-8.866e+07**	-2.553e+07**	-3.803e+06	6.952e+07
	(4.231e+07)	(9.990e+06)	(5.373e+06)	(6.144e+07)
cap_output_2	3.575e+07*	6.221e+06	-37,129	-7.980e+07**
	(2.074e+07)	(4.664e+06)	(3.693e+06)	(3.667e+07)
cap_lab	312.2	-4.775	-88.35	207.7
	(217.9)	(80.26)	(73.76)	(255.5)
cap_lab_2	-0.000232	0.000333	0.000462	-0.000217
	(0.000470)	(0.000302)	(0.000298)	(0.000509)
white_emplshare	4.971e+07*	2.960e+07	4.015e+07**	4.242e+07
	(2.652e+07)	(2.499e+07)	(1.937e+07)	(5.610e+07)
white_emplshare_2	-1.585e+08**	-3.965e+07	-6.581e+07**	-1.007e+08
	(7.999e+07)	(4.065e+07)	(2.996e+07)	(1.016e+08)
unsk_wshare	6.700e+07*	1.495e+07	-6.091e+06	3.174e+07
	(3.471e+07)	(1.408e+07)	(4.210e+06)	(5.982e+07)
unsk_wshare_2	-5.433e+07	-3.920e+06	7.907e+06**	-5.135e+07
	(3.423e+07)	(1.031e+07)	(3.092e+06)	(5.072e+07)
Constant	-8.571e+06**	-3.708e+06	1.053e+06	-1.493e+07
	(3.563e+06)	(3.232e+06)	(1.696e+06)	(2.137e+07)
Observations	38,420	38,420	38,420	38,420
R-squared	0.002	0.006	0.006	0.003

	1999					
	(23)	(24)	(25)	(26)	(27)	(28)
VARIABLES	out_imp * cr60	out_imp *cr70	out_imp *cr80	out_imp *pca	out_imp *pca2	out_imp
cr4a				-200,988*	329,712	-4.511e+06
				(106,452)	(314,434)	(4.149e+06)
cr4_2				170,876**	-199,290	2.930e+06
				(84,017)	(279,146)	(2.955e+06)
empl	-2.361**	-1.643	-1.683***	6.762*	-1.772	40.91
	(1.140)	(1.133)	(0.442)	(3.829)	(1.945)	(41.33)
empl_2	9.20e-06	3.87e-06	1.56e-05***	-6.14e-05	7.88e-06	-0.000497
	(1.46e-05)	(1.42e-05)	(5.14e-06)	(3.91e-05)	(2.69e-05)	(0.000430)
firms	-346.9***	-439.2***	-96.33***	-106.8	79.37	-2,545
	(119.1)	(108.9)	(19.67)	(126.4)	(121.2)	(2,416)
firms_2	0.381***	0.465***	0.124***	-0.0173	0.0421	0.678
	(0.122)	(0.115)	(0.0196)	(0.0339)	(0.125)	(0.783)
wht_blk	-58,396	-41,821	-16,432	20,352	-6,325	1.339e+06
	(76,780)	(73,435)	(16,733)	(15,672)	(119,599)	(1.063e+06)
wht_blk_2	31,225	10,080	8,392	-8,642	-57,005	-338,322
	(32,279)	(29,409)	(8,069)	(7,155)	(41,619)	(227,204)
cap_output	-1.051e+06***	-931,050***	-274,418*	248,694**	-487,460	-1.256e+06*
	(302,618)	(296,686)	(154,127)	(121,698)	(358,085)	(687,305)
cap_output_2	1.006e+06***	968,163***	743,864**	-148,927**	541,086	1.764e+06**
	(324,388)	(322,893)	(314,822)	(72,209)	(338,898)	(849,481)
cap_lab	2.531**	1.708	-0.519*	-0.833*	3.007**	6.867***
	(1.110)	(1.075)	(0.293)	(0.437)	(1.208)	(2.148)
cap_lab_2	-2.88e-06	-1.39e-06	1.99e-06*	1.07e-06*	-3.80e-06*	-1.45e-05**
	(1.97e-06)	(1.91e-06)	(1.15e-06)	(5.65e-07)	(2.20e-06)	(5.83e-06)
white_emplshare	-798,921	-872,143	151,180	305,548*	-1.358e+06*	727,652
	(700,691)	(700,528)	(100,409)	(156,269)	(733,510)	(1.491e+06)
white_emplshare_2	1.271e+06	1.676e+06	-337,658**	-377,862**	2.702e+06**	-4.467e+06
	(1.263e+06)	(1.259e+06)	(157,367)	(184,904)	(1.339e+06)	(4.958e+06)
unsk_wshare	958,616	796,736	-181,394**	427,233**	-1.192e+06	-3.237e+06*
	(609,946)	(609,714)	(82,360)	(200,844)	(1.128e+06)	(1.924e+06)
unsk_wshare_2	-847,244	-512,017	229,309***	-355,736**	853,674	2.869e+06*
	(468,002)	(467,709)	(70,210)	(167,250)	(895,115)	(1.645e+06)
Constant	-73,848	-33,478	76,095***	-152,046**	449,291*	1.949e+06
	(126,690)	(126,345)	(23,351)	(87,975)	(261,845)	(1.305e+06)
Observations	56,675	56,675	56,675	56,675	56,675	50,133
R-squared	0.003	0.003	0.007	0.002	0.003	0.001

Table 15: First Stage Regressions

	2004							2008						
	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)
VARIABLES	out_imp * cr60	out_imp *cr70	out_imp *cr80	out_imp *pca	out_imp *pca2	out_imp *barg	out_imp	out_imp * cr60	out_imp *cr70	out_imp *cr80	out_imp *pca	out_imp *pca2	out_imp *barg	out_imp
cr4e				-7.223e+06***	1.531e+07***	-6.424e+07***					-2.051e+07***	2.424e+07***	3.962e+07	
				(1.957e+06)	(2.560e+06)	(1.653e+07)					(2.657e+06)	(2.792e+06)	(3.948e+07)	
cr4_2				5.927e+06***	-7.228e+06***	5.484e+07***					1.605e+07***	-1.142e+07***	-5.035e+07*	
				(1.413e+06)	(2.139e+06)	(1.572e+07)					(1.987e+06)	(2.243e+06)	(2.991e+07)	
empl	-74.39***	-67.46***	-63.11***	135.2***	19.11	-257.2***	-35.56	6.105	17.34	-47.94***	306.1***	32.16	-13.52	147.4***
	(9.295)	(7.402)	(6.584)	(22.26)	(12.00)	(66.97)	(25.72)	(22.32)	(17.20)	(11.45)	(37.92)	(25.15)	(316.4)	(44.14)
empl_2	0.000771***	0.000685***	0.000685***	-0.00125***	-0.000389**	0.00409***	0.00115***	0.000572**	0.000625***	0.000501***	-0.00307***	7.05e-05	0.00105	-0.00135**
	(0.000128)	(0.000104)	(7.88e-05)	(0.000231)	(0.000173)	(0.000734)	(0.000281)	(0.000238)	(0.000153)	(0.000131)	(0.000438)	(0.000290)	(0.00359)	(0.000527)
firms	-3,213***	-5,516***	-2,971***	3,221**	6,803***	-1,594	-4,403**	-12,356***	-15,330***	-1,805***	-3,909*	6,018***	2,534	-10,019***
	(651.3)	(444.8)	(334.8)	(1,489)	(1,206)	(5,176)	(1,711)	(1,376)	(1,202)	(418.8)	(2,116)	(1,566)	(23,103)	(2,456)
firms_2	3.463***	6.167***	3.817***	-3.180**	-3.095***	-8.190***	3.128*	8.469***	11.40***	2.370***	-0.767	-2.190**	-8.369	6.766***
	(0.620)	(0.410)	(0.332)	(1.365)	(0.891)	(3.151)	(1.616)	(0.973)	(0.792)	(0.317)	(2.095)	(1.078)	(11.14)	(2.381)
wht_blk	-8.834e+06***	-7.637e+06***	-3.636e+06***	-1.645e+06***	-7.763e+06***	-6.983e+06*	-1.260e+07***	801,919	936,917	-1.734e+06***	-1.776e+06***	-5.376e+06***	-1.302e+07	-1.261e+07***
	(860,721)	(790,501)	(335,757)	(349,201)	(744,789)	(4.081e+06)	(1.208e+06)	(1.004e+06)	(817,039)	(404,804)	(525,390)	(1.240e+06)	(1.450e+07)	(1.698e+06)
wht_blk_2	4.075e+06***	2.998e+06***	1.238e+06***	926,737***	1.819e+06***	3.607e+06**	4.454e+06***	915,837**	127,157	967,298***	883,721***	670,848	9.480e+06**	4.276e+06***
	(349,811)	(300,768)	(131,548)	(132,174)	(286,315)	(1.592e+06)	(456,695)	(418,912)	(331,906)	(201,554)	(211,337)	(310,070)	(4.376e+06)	(655,328)
cap_output	-1.874e+07***	-1.259e+07***	-4.409e+06***	5.873e+06***	-4.066e+06***	-2.318e+07*	-372,623	-1.077e+07***	-2.586e+06	-5.190e+06**	2.276e+07***	-80,599	-4.458e+07*	1.345e+07***
	(1.938e+06)	(1.690e+06)	(1.254e+06)	(982,316)	(1.515e+06)	(1.258e+07)	(2.369e+06)	(3.473e+06)	(2.857e+06)	(2.603e+06)	(2.104e+06)	(3.129e+06)	(2.276e+07)	(4.821e+06)
cap_output_2	7.671e+06***	5.681e+06***	2.708e+06***	-2.486e+06***	656,435	1.096e+07***	-2.698e+06**	781,589	-3.088e+06	-1.316e+06	-1.783e+07***	-2.475e+06	2.460e+07	-1.976e+07***
	(823,083)	(736,216)	(586,122)	(458,495)	(695,599)	(3.819e+06)	(1.103e+06)	(2.696e+06)	(2.425e+06)	(2.355e+06)	(1.566e+06)	(2.523e+06)	(2.917e+07)	(3.714e+06)
cap_lab	76.67***	41.55***	12.82***	-15.88***	28.40***	116.9***	33.35***	54.24***	14.67*	15.99**	-34.85***	22.81**	148.0***	10.65
	(6.749)	(5.076)	(3.502)	(3.541)	(5.002)	(25.29)	(8.157)	(9.921)	(7.739)	(6.617)	(4.814)	(9.123)	(41.64)	(12.31)
cap_lab_2	-0.000114***	-5.00e-05***	-1.40e-06	1.67e-05***	-3.91e-05***	-0.000214***	-6.29e-05***	-7.31e-05***	-2.50e-06	4.45e-06	3.72e-05***	-2.29e-05	-0.000117	-1.21e-05
	(1.34e-05)	(1.08e-05)	(8.94e-06)	(5.45e-06)	(1.11e-05)	(4.03e-05)	(1.53e-05)	(1.81e-05)	(1.48e-05)	(1.35e-05)	(7.41e-06)	(1.74e-05)	(8.37e-05)	(2.16e-05)
white_emplshare	2.750e+07***	1.865e+07***	6.932e+06***	1.710e+07***	9.228e+06***	8.175e+07***	5.447e+07***	7.084e+06	2.825e+06	717,813	3.196e+07***	5.544e+06	1.373e+08***	5.094e+07***
	(3.354e+06)	(3.143e+06)	(1.248e+06)	(2.478e+06)	(2.802e+06)	(9.609e+06)	(5.161e+06)	(5.145e+06)	(4.929e+06)	(1.238e+06)	(4.518e+06)	(6.129e+06)	(3.810e+07)	(7.455e+06)
white_emplshare_2	-5.317e+07***	-2.940e+07***	-1.158e+07***	-2.871e+07***	-6.393e+06	-1.604e+08***	-8.495e+07***	-3.504e+07***	-1.386e+07*	-5.659e+06**	-4.950e+07***	-2.375e+06	-2.741e+08***	-7.952e+07***
	(5.257e+06)	(4.485e+06)	(1.721e+06)	(3.879e+06)	(4.068e+06)	(1.889e+07)	(8.229e+06)	(8.141e+06)	(7.492e+06)	(2.276e+06)	(6.715e+06)	(9.320e+06)	(6.053e+07)	(1.147e+07)
unsk_wshare	-1.627e+07***	-2.762e+07***	-1.868e+07***	1.624e+07***	-3.653e+07***	-1.928e+08***	881,308	5.416e+07***	3.871e+07***	9.154e+06***	1.454e+07***	7.915e+06	-2.605e+07	2.713e+07***
	(4.804e+06)	(4.704e+06)	(3.825e+06)	(2.406e+06)	(5.829e+06)	(4.921e+07)	(6.416e+06)	(4.206e+06)	(3.936e+06)	(2.082e+06)	(1.734e+06)	(7.076e+06)	(3.116e+07)	(6.826e+06)
unsk_wshare_2	1.413e+07***	2.323e+07***	1.432e+07***	-1.462e+07***	2.309e+07***	1.615e+08***	-6.916e+06	-4.854e+07***	-3.509e+07***	-8.652e+06***	-1.119e+07***	-1.956e+07***	2.919e+07	-3.459e+07***
	(3.982e+06)	(3.908e+06)	(3.142e+06)	(2.261e+06)	(4.703e+06)	(3.882e+07)	(5.470e+06)	(3.673e+06)	(3.437e+06)	(1.834e+06)	(1.659e+06)	(5.774e+06)	(2.741e+07)	(5.632e+06)
Constant	6.968e+06***	1.059e+07***	7.697e+06***	-4.846e+06***	9.431e+06***	7.029e+07***	3.590e+06*	-1.142e+07***	-7.723e+06***	-398,372	-5.017e+06***	-4.520e+06*	-4.809e+06	-1.318e+06
	(1.544e+06)	(1.507e+06)	(1.233e+06)	(960,201)	(1.917e+06)	(1.986e+07)	(2.056e+06)	(1.236e+06)	(1.174e+06)	(399,445)	(1.248e+06)	(2.461e+06)	(1.997e+07)	(2.225e+06)
Observations	83,788	83,788	83,788	83,788	83,788	72,835	83,788	88,010	88,010	88,010	88,010	88,010	76,472	88,010
R-squared	0.012	0.010	0.008	0.015	0.016	0.002	0.005	0.009	0.007	0.008	0.014	0.011	0.001	0.005

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

Table 16: GH model with tariffs - with different organisation dummies to check investigate the changing political economy of protection (additional information for table 8)

D var: (tar/(1+tar))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(1
	1993					1996					1996 with 1993 industry		1999 with 1996 Ind	
VARIABLES	cr70	cr80	pca	pca2	barg	cr70	cr80	pca	pca2	barg	cr70	cr80	cr70	cr
output import ratio	1.83e-08***	2.60e-08***	1.67e-08**	2.86e-08***	4.25e-08***	3.45e-09***	2.83e-08***	2.38e-09	4.79e-08***	4.74e-08***	2.38e-08***	3.15e-08***	1.70e-08***	1.93e-
	(2.76e-09)	(2.67e-09)	(6.62e-09)	(8.78e-09)	(6.07e-09)	(1.09e-09)	(1.46e-09)	(1.85e-09)	(1.48e-08)	(7.92e-09)	(5.73e-09)	(5.07e-09)	(1.18e-09)	(1.32e-
out_imp ratio *cr70	7.40e-08***					4.34e-08***					5.79e-08***		1.40e-07***	
	(6.11e-09)					(2.66e-09)					(9.73e-09)		(4.47e-09)	
out_imp ratio *cr80		5.64e-08***					1.03e-07***					3.85e-08***		1.12e-
		(5.14e-09)					(3.87e-09)					(7.17e-09)		(4.38e-
out_imp ratio *pca			-5.96e-08*					-5.37e-08***						
			(3.21e-08)					(1.17e-08)						
out_imp ratio *pca2				-2.60e-08*					-4.74e-08***					
				(1.34e-08)					(1.55e-08)					
out_imp ratio *barg					-3.16e-08***					-4.17e-08***				
					(5.14e-09)					(6.59e-09)				
Constant	-0.132***	-0.129***	-0.182***	-0.219***	-0.172***	-0.420***	-0.435***	-0.490***	-0.688***	-0.628***	-0.528***	-0.537***	-0.654***	-0.600
	(0.0246)	(0.0222)	(0.0593)	(0.0567)	(0.0380)	(0.0149)	(0.0140)	(0.0268)	(0.0616)	(0.0551)	(0.0443)	(0.0393)	(0.0155)	(0.015
Observations	41,023	41,023	41,023	41,023	41,023	48,934	48,934	48,934	48,934	48,934	31,564	31,564	34,260	34,260

Standard errors in parentheses

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

Table 17: GH model with AD - with different organisation dummies to check investigate the changing political economy of protection (additional information for table 8

	1993					1996					1996 with 1993		1999 with 1996	
D var: (ad_eq/(1+ad_eq))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
VARIABLES	cr70	cr80	pca	pca2	barg	cr70	cr80	pca	pca2	barg	cr70	cr80	cr70	cr80
output import ratio	-1.66e-07	-1.66e-07	-9.80e-08	-7.32e-08	4.68e-08	-2.39e-06**	-2.29e-06**	-2.81e-06***	-4.99e-06	-5.89e-06	2.10e-07	-1.25e-07	-1.69e-06*	-1.80e-06*
	(1.59e-07)	(1.59e-07)	(8.69e-08)	(1.14e-07)	(4.83e-07)	(1.12e-06)	(1.08e-06)	(8.48e-07)	(3.88e-06)	(3.82e-06)	(1.63e-06)	(2.06e-06)	(9.89e-07)	(9.79e-07)
out_imp ratio *cr70	-4.56e-05					-1.33e-05*					7.88e-07		3.42e-07	
	(6.27e-05)					(7.14e-06)					(2.37e-06)		(5.11e-06)	
out_imp ratio *cr80		-4.56e-05					-1.43e-05**					7.27e-05		2.94e-07
		(6.27e-05)					(7.12e-06)					(4.57e-05)		(5.30e-06)
out_imp ratio *pca			4.63e-06					-2.33e-05						
			(4.97e-06)					(1.53e-05)						
out_imp ratio *pca2				-5.10e-08					2.68e-06					
				(1.22e-07)					(3.75e-06)					
out_imp ratio *barg					-1.47e-07					4.26e-06				
					(4.16e-07)					(5.10e-06)				
Constant	0.477*	0.477*	0.344***	0.350**	0.388**	2.672***	2.757***	1.762***	1.878***	2.018***	1.263**	0.194	1.110***	1.120***
	(0.247)	(0.247)	(0.131)	(0.144)	(0.159)	(0.817)	(0.790)	(0.503)	(0.614)	(0.487)	(0.613)	(1.034)	(0.390)	(0.376)
Observations	18	18	18	17	18	52	52	52	52	52	50	50	98	98

	1999 with 1996 industry data					2004 with 1996 industry data					2008 with 1996 industry data				
D var: (ad_eq/(1+ad_eq))*e	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
VARIABLES	cr70	cr80	pca	pca2	barg	cr70	cr80	pca	pca2	barg	cr70	cr80	pca	pca2	barg
output (sales) import ratio	-9.80e-06	-6.85e-06	-5.64e-06	-0.000135	7.59e-06	-1.08e-06***	-1.99e-06***	5.31e-06**	-1.21e-06***	-3.57e-07	-2.53e-07***	-5.93e-08	-3.73e-08	-1.11e-06***	5.50e-07
	(5.30e-05)	(5.55e-05)	(3.42e-05)	(0.000147)	(3.86e-05)	(1.01e-07)	(5.54e-08)	(2.61e-06)	(7.06e-08)	(2.17e-07)	(7.44e-08)	(1.01e-07)	(1.13e-07)	(6.80e-08)	(1.98e-06)
out_imp (sales) *cr70	2.78e-05					-0.00141***					2.53e-07				
	(6.45e-05)					(0.000163)					(1.54e-07)				
out_imp (sales) *cr80		2.16e-05					0.00215					1.69e-05			
		(6.66e-05)					(0.00163)					(3.08e-05)			
out_imp (sales) *pca			-0.000154					-5.67e-06**					4.10e-06		
			(0.000261)					(2.63e-06)					(2.83e-06)		
out_imp (sales) *pca2				0.000129					1.89e-06					1.05e-06***	
				(0.000142)					(8.90e-06)					(1.62e-07)	
out_imp (sales) *barg					-5.78e-05					6.93e-06**					-9.27e-07
					(7.79e-05)					(3.45e-06)					(3.31e-06)
Constant	0.940***	0.950***	1.015***	1.235***	1.045***	0.694***	-0.127	0.209	0.204	0.214	0.482	0.389	0.565	0.665*	0.435
	(0.359)	(0.358)	(0.345)	(0.442)	(0.365)	(0.214)	(0.203)	(0.405)	(0.194)	(0.427)	(0.395)	(0.426)	(0.422)	(0.382)	(0.433)
Observations	97	97	97	98	97	86	86	86	86	86	52	52	52	51	52

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 18: GH model with AD and tariffs combined - with different organisation dummies to check investigate the changing political economy of protection (additional information for table 8

	1993				1996				1996 with 1993		1999 with 1996 industry	
D var: (tar_ad/(1+tar_ad))*e	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	cr70	cr80	pca	barg	cr70	cr80	pca	barg	cr70	cr80	cr70	cr80
out_imp	2.05e-08***	2.88e-08***	1.88e-08***	4.66e-08***	4.41e-09***	3.02e-08***	3.44e-09*	5.11e-08***	2.83e-08***	3.62e-08***	1.84e-08***	2.10e-08***
	(2.84e-09)	(2.76e-09)	(6.54e-09)	(6.23e-09)	(1.14e-09)	(1.50e-09)	(1.87e-09)	(8.26e-09)	(6.01e-09)	(5.32e-09)	(1.27e-09)	(1.42e-09)
out_imp_org_cr60												
out_imp_org_cr70	7.76e-08***				4.33e-08***				5.90e-08***		1.49e-07***	
	(6.30e-09)				(2.78e-09)				(1.02e-08)		(4.79e-09)	
out_imp_org_cr80		6.03e-08***				1.07e-07***				3.99e-08***		1.20e-07***
		(5.30e-09)				(3.98e-09)				(7.53e-09)		(4.68e-09)
out_imp_org_pca			-5.89e-08*				-4.61e-08***					
			(3.17e-08)				(1.18e-08)					
out_imp_org_barg				-3.40e-08***				-4.42e-08***				
				(5.27e-09)				(6.87e-09)				
Constant	-0.0721***	-0.0688***	-0.124**	-0.113***	-0.379***	-0.391***	-0.450***	-0.589***	-0.497***	-0.506***	-0.667***	-0.610***
	(0.0254)	(0.0229)	(0.0586)	(0.0389)	(0.0156)	(0.0144)	(0.0272)	(0.0574)	(0.0465)	(0.0413)	(0.0166)	(0.0163)
Observations	41,023	41,023	41,023	41,023	48,934	48,934	48,934	48,934	31,564	31,564	34,260	34,260

	1999 with 1996 industry data				2004 with 1996 industry data				2008 with 1996 industry data			
D var: (tar_ad/(1+tar_ad))*e	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
VARIABLES	cr70	cr80	pca	barg	cr70	cr80	pca	barg	cr70	cr80	pca	barg
sal_imp	-1.72e-06***	-1.12e-06***	-8.39e-07**	2.84e-06**	-7.95e-09	7.68e-08***	1.08e-07***	6.07e-08***	2.49e-09	-2.69e-08***	1.69e-08***	6.70e-08***
	(3.44e-07)	(3.19e-07)	(3.49e-07)	(1.18e-06)	(6.31e-09)	(8.04e-09)	(8.79e-09)	(4.48e-09)	(4.70e-09)	(4.22e-09)	(4.72e-09)	(1.45e-08)
sal_imp_org_cr60												
sal_imp_org_cr70	3.40e-06***				2.50e-07***				8.27e-09			
	(4.69e-07)				(1.03e-08)				(8.36e-09)			
sal_imp_org_cr80		2.43e-06***				1.46e-07***				1.08e-06***		
		(4.42e-07)				(2.21e-08)				(2.49e-08)		
sal_imp_org_pca			5.31e-07				3.24e-08**				-3.49e-08***	
			(1.44e-06)				(1.61e-08)				(6.27e-09)	
sal_imp_org_barg				-1.59e-06***				-3.22e-10				-3.64e-08***
				(3.79e-07)				(2.03e-09)				(8.24e-09)
Constant	-0.816***	-0.808***	-0.832***	-1.037***	-0.795***	-1.051***	-1.239***	-0.807***	-0.743***	-0.790***	-0.845***	-1.158***
	(0.0500)	(0.0497)	(0.0586)	(0.135)	(0.0238)	(0.0308)	(0.0416)	(0.0197)	(0.0252)	(0.0260)	(0.0278)	(0.0772)
Observations	50,098	50,098	50,098	50,098	72,720	72,720	72,720	72,720	75,860	75,860	75,860	75,860

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1