A Strategic Model of Antidumping Investigations

Introduction

What factors affect antidumping (AD) investigations? Which cases are more likely to lead to trade wars? The existing literature suggests that a number of political and economic factors such as case characteristics, macroeconomic conditions and also political factors influence outcomes of AD investigations (WTO 2009). AD is one of the very few trade policy measures that fall outside the scope of the most-favored nation principle and can be applied bilaterally. It is the most frequently used instrument for contingent protection and can pose considerable barriers to free trade.[1] Furthermore, it is a frequent source of conflict among WTO members (Bown 2009). Imposing AD measures is strategic in the sense that there are multiple actors involved and each takes the expected action of others into account when making decisions. When deciding about the imposition of trade restrictions against exporters, possible retaliation by the target country looms large in the political discussion. This is visible for example in the conflict about DRAMS between the US and Taiwan (James 2008) or in the recent cases about solar panels involving the US, the EU and China. Scholars note that the imposition of trade barriers is clearly non-random (Bown 2009). However, researchers have so far hardly investigated AD empirically with approaches that can adequately account for the underlying strategic process. Research by Signorino (1999) and Signorino and Yilmaz (2003) shows that modelling strategic processes with standard regression models can easily give rise to misspecification and flawed inference. This paper therefore uses a unified approach, i.e. the theoretical model is also the statistical model, to analyze the determinants of AD cases.

It sets out a simple two-stage sanctioning game to formalize the AD process with the investigating country deciding about the implementation of new duties and the target country that can choose to react and retaliate. The game includes private information concerning utilities so that positive probabilities over all outcomes are guaranteed and the model can be directly used for statistical estimation. Empirically, the analysis uses data from the temporary trade barrriers' database (Bown 2010) and examines a large dataset of more than 1400 cases from 1995 to 2008. Results show that cases involving steel products and targeting non-market economies are more likely to end with new measures and escalate further. As for domestic political economy determinants, investigating countries with large winning coalitions tend to be more cautious and try to avoid trade wars –a result consistent with Bueno de Mesquita et al (2003). Finally, the analysis shows a non-monotonic effect of relative economic capabilities on outcomes. Trade wars seem to be more likely when the two countries involved are similar in terms of market size while cases with large disparities between investigator and target hardly seem to escalate.

[1] Milner and Rosendorff (2001) show that options for contingent protection can be part of an optimal design of trade institutions because they prevent members from permanently defecting thereby stabilizing the system at large. However, this paper does not focus on the systemic question whether having AD measures comes at a benefit or cost but starts from the actual investigations and examines their determinants.

The paper yields new insights on determinants of AD outcomes and the emergence of trade wars across countries. The core theoretical novelty is the analysis of trade policy with a unified modeling approach that can account for strategic interaction empirically. It thereby contributes to an emerging literature that applies strategic models to political and economic issues such as exchange rate arrangements (Leblang 2003), armed conflicts (Signorino/Tarar 2006), economic sanctions (McLean/Whang 2010) or the imposition of legislation in the EU (König/Mäder 2010).

The rest of the paper proceeds as follows. The next section provides an overview of the relevant literature informing the paper. Next, the paper presents the theoretical model and specifies utilities for regressors. Section four describes the data, presents and discusses the main empirical findings. Finally, the concluding section identifies possible avenues for further research.

What Influences AD investigations?

AD is one of the most important instrumentst of protection today and frequently at the heart of trade policy controversies (Hoekman/Kosteki 2001, Bown 2009). Empirical relevance for business, policymakers and for the global trading system as a whole as well as the multitude of theoretical issues AD entails, have given rise to an extensive literature with contributions from law, economics and political sciences. This review focuses on works that have investigated determinants of AD investigations, the role of political factors in particular, and how the emerging literature on strategic models relates to this research (however, see Nelson 2006 and WTO 2009 for a wider review of the literature with a focus on analyses from political sciences and economics).[2]

Starting with the seminal early works by Finger, Hall and Nelson (1982) and Takacs (1981), scholars have investigated the impact of economic conditions as well as "political" factors such as industries' organizational capabilities or contributions on AD. Leidy (1997) presents evidence that macroeconomic conditions have affected contingent protection in the US and notably that increases in unemployment translate into additional petitions. Knetter and Prusa (2003) find a similar effect of economic conditions and show that declines in GDP are associated with increases in AD filings in four developed markets (US, EU, Canada, Australia). Francois and Niels (2006) find similar patterns for an emerging market examining the example of Mexico. One of the few large-n cross country analyses is Aggarwal (2004) who analyses AD cases from 1980 to 2000 for a sample of 99 countries. His analysis however suggests that macroeconomic factors (lagged growth rate and industrial value added) matter to a different extent across countries and tend to have a larger impact in

[2] Note that there is also a literature that focuses on the role of AD from a systemic perspective investigating questions of institutional design (Milner/Rosendorff 2001, Kucik/Reinhardt 2008).

developed economies. This is an interesting result as it suggests that the impact of economic conditions is mediated by and/or contingent on other factors.

With respect to factors that make petitions more likely to succeed, "political clout" determined through the size of the petitioning industry and its concentration matter, too (Finger/Hall/Nelson 1982 for the US, Tharakan/Walbroek 1994 and Eymann/Schuhknecht 1996 for the EU). Hansen (1990), Hansen/Prusa (1996) and Evans/Sherlund (2006) also show that monetary donations from industries can affect filing outcomes but for reasons of data availability the effect of political contributions has so far only been investigated for the US. What follows from this research is that it matters who asks for protection. However, cross-country studies of institutional determinants still remain rare. Scholars also argue that some targets are more likely to see protection imposed: Hansen and Prusa (1996) have evidence that US cases against Japan and China more often end with affirmative decisions than investigations targeting western European countries. However, the finding that some are more frequently targeted than others is not explicitly related to strategic reasoning and tested across different investigator-target combinations. In that sense, they do not directly investigate a strategic rationale –even though it is increasingly acknowledged that the imposition of trade barriers is selective. Bown (2009) argues that countries' capacity to challenge barriers with a trade dispute can deter the imposition of trade restrictions. A couple of papers have started to investigate how legal trade disputes (or the threat of) affect AD investigations accordingly. Busch, Reinhardt and Shaffer (2008) examine whether countries with stronger legal capacity are less likely to suffer from barriers. Estimating probit models, they provide evidence that countries more capable to challenge AD duties in court, are less likely to see measures imposed against them. Similarly, Bloningen and Bown (2003) develop a game starting from industries' decision to file and then governments' decision to impose a measure at the second stage. Estimating a nested logit model for US-AD cases between 1980 and 1998, the authors find evidence for a deterrence effect of legal challenges. However, Bloningen and Bown do not examine the direct effects of "vigilante justice", i.e. the possibility that the target country retaliates with AD, on investigating authorities' decision to impose measures, which is the focus of this analysis. Yet the possibility of retaliatory AD measures is frequently an issue in political discussions and in howfar they are used matters for the functioning of the trading system at large.

Methodologically, Signorino (1999) and Signorino and Yilmaz (2003) point out that traditional empirical techniques are inadequate to estimate strategic relationships correctly and can esily give rise to incorrect inference. Qunantal response equilibrium models (QRE) (McKelvey/Palfrey 1995) provide one possibility to better deal with the zero-likelihood problem and model non-monotonic strategic interaction.[3] Recently, QRE models have been

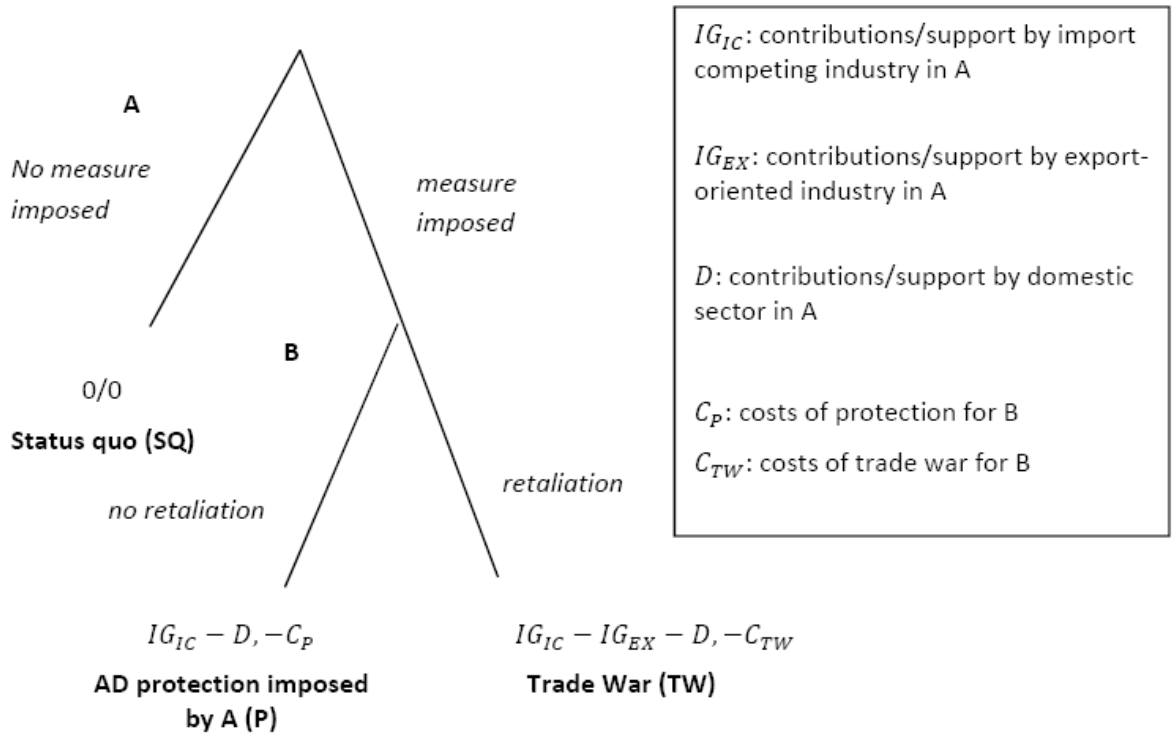
[3] This way, each outcome occurs with a positive probability.

used to analyze a number of issues such as exchange rate arrangements (Leblang 2003), the deterrence and armed conflict (Signorino/Tarar 2006), economic sanctions (McLean/Whang 2010) and legislative compliance (König/Mäder 2010). This paper is –to the best of my knowledge- the first one to apply a unified theory and empirical test to AD investigations. Hence, on the one hand this analysis contributes to an established body of literature on AD that tests that assesses the impact of political and economic conditions on AD patterns. It does so using a new empirical methodology and investigates a large set of cases and can thereby contribute new insights on cross-country determinants, notably the impact of countries institutional framework. At the same time, this paper adds to the emerging literature that uses a "unified approach" –in the sense that the theoretical model is also the statistical model- and provides an application of QRE modeling to a new domain.

The Theoretical Model

This paper uses a simple stylized two-party sanctioning game (Bueno de Mesquita 2006) to analyze AD investigations. The basic structure of the game is displayed in figure 1.

Figure 1: The Stylized AD-Game



In the first stage, AD authorities in country A investigate a case and decides whether to impose new measures or not. If the investigation concludes without new measures, the status quo (SQ) prevails and the game ends. If the investigating country imposes a new measure, the targeted trading partner B has two options to react: it can acquiesce (P), which means

that exporters suffer or can react by launching an AD investigation against imports from A. This is the trade war (TW) outcome in the game. The payoffs for the players are based on reactions to restrictions by different domestic groups and how they affect domestic political support for leaders in power (BdM 2006). If import-competing industries who have asked for protection succeed, player A gets a positive reward from them ($IG_{IC} > 0$), e.g. through contributions by respective industries. Essentially, IG_{IC} can be interpreted as rewards from special interests or the „political" reasons to grant protection. However, whether it pays off to give in depends on the size of IG_{IC} relative to IG_{EX} and D. D denotes changes in contributions by the domestic sector in A comprising for example processing industries and retailers that suffer from higher prices for imports when new AD protection is imposed. In addition, this group dislikes the negative welfare effects associated with new protection because they translate into lower demand for consumer products, a less efficient allocation of ressources and ultimately reduced growth. Hence it is assumed that D>0, i.e. the domestic sector reacts to new protection with cutting support and D consequently forms part of the costs of providing protection. Finally, exporters are aggrieved when the country ends up in a trade war (IG_{EX}>0).[4] The model assumes that exporters only reduce political support in the trade war scenario because in this case they suffer concentrated losses through restricted foreign market access. Without retaliation, the effect remains indirect and saliency is lower which makes it difficult to overcome collective action problems. Hence the final payoffs for A comprise how these three groups react to a new measure.[5] Note that this calculus is set up in terms of the political costs and benefits of granting AD protection. While imposing protectionist measures may only very rarely be warranted on economic grounds, political considerations provide the motivation most of the time (BdM 2006 p.426, Krugman/Obstfeld 2006). Hence, $IG_{IC} > D$ can be understood as a situation where protection actually helps to ensure domestic political support. This situation may arise from differences in saliency and organizational capacity of the different industries involved.

Since the domestic sector suffers less directly from protection and the group of affected industries may be more diverse, it may be more difficult for them to organize against the imposition of protection. In addition, other domestic industries may face an informational disadvantage as they have to spent time and resources to get sufficient information about ongoing AD-investigations and some information may not be publicly available. Basically, these factors enable import competing industries to "shout louder" and to offer benefits in

[4] See Milner (1988) who develops an argument how more outwardly oriented firms can help to counterbalance protectionist pressure and contribute to maintain open markets.

[5] By distinguishing three different groups, this model departs from the standard two-factor-two goods setup that is typically used to analyze the impact of trade (and protection) in economics. While the stylized 2x2 framework is mainly concerned with explaining thedistributional consequences of trade (and specialization patterns that follow from them), this approach also takes the distributional consequences into account but is mainly concerned with how they affect political decision-making.

terms of political support that make it appealing for incumbent A to give in to demands for protection. Hence, demands for AD-protection frequently suceed –an observation consistent with AD investigations which frequently end with the imposition of new measures- even if there is domestic political opposition. For example in the in the case of import duties for shoes from China and Vietnam to the EU, retailers and producers of sport goods finally lost to shoe manufacturers who lobbied emphatically for protection.

For player B, SQ is the preferred outcome as exporters continue to enjoy unfettered market access. The decision to remain passive in the face of new restrictions depends on the relative costs of a trade war and may be influenced by a number of political and economic factors such as for example economic size. Player A wants to avoid retaliation by the target but is uncertain about its reaction. The strategic rationale suggests that the higher the expectations that the target will hit back, the more likely A gets to reject calls for protection (c.p.). Comparative statics of the model further suggest that higher costs imposed by the domestic sector and exporters dampen calls for protection in the investigating country while a strong clout of import competing interests make new measures more likely (see A1 for derivation of comparative statics).

The model can also be extended to show how domestic political institutions affect decisions about trade protection in the investigating country. Protection brings concentrated benefits to a few but inflicts costs on the many. Therefore we assume that the median voter prefers SQ and is more likely to reelect the incumbent in this situation. Hence, adding accountability to the median voter dampens incentives to introduce protection. This basic insight about the effect of democratic rule on trade policy has been put forward frequently in the comparative political economy literature and receives empirical support (Milner/Kubota 2005). Nevertheless, the microfoundations behind this link, i.e. which institutional features about democracy promote openness and how, remain less assessed. Bueno de Mesquita et al (2003) suggest that it is not democratic rule per se but the size of the winning coalition (w) which promotes openness. Essentially, it focuses political competition on the provision of public goods, hence leaders have an incentive to provide welfare-enhancing policies and they can be punished –i.e. removed from office- if they don't deliver. The effect of w is one of the key variables that is assessed in the following empirical analysis.

The Empirical Model

When testing theories of strategic interaction, discrete choice models face their limits as they can not account for interaction at various stages and can easily give rise to incorrect inference. In addition, traditional equilibrium concepts applied for game theoretic models are difficult to handle with standard empirical techniques such as logit and probit because of the zero-likelihood problem (Signorino 1999). The QRE model is based on random utility assumptions and provides for a game-theoretic solution concept that can be used for

empirical estimation.

Assume that true utilities for outcomes consist of an observable and an unobservable component.[6] A's utility for SQ can be expressed as

$$U_A^*(SQ) = U_A(SQ) + \pi_{A1}$$

with $U_A^*(SQ)$ being A's true utility for the status quo and $U_A(SQ)$ denoting the component that both player B and the analyst can observe. π_{A1} comprises all information that is private to player A. Essentially, π_{A1}, is a random variable. It is assumed that player B and the researcher only know its distribution and that the researcher cannot perfectly observe player A's utilities. Furthermore, it is assumed that all payoff perturbations are independently and identically distributed normally, i.e. with mean 0 and variance σ^2. Let p_i denote the probability that A implements a measure (and $p_{\bar{i}}$ that A does not implement a measure respectively). Similarly, p_r gives the probability that B retaliates (and $p_{\bar{r}}$ that B does not retaliate respectively). With both players maximizing their expected, i.e. their true, utility when making decisions, the choice probabilities can be expressed as

1) $p_r = \Phi\left[\frac{U_B(TW) - U_B(P)}{\sqrt{2\sigma^2}}\right]$

2) $p_i = \Phi\left[\frac{p_r U_A(TW) + p_{\bar{r}} U_A(P) - U_A(SQ)}{\sqrt{\sigma^2(p_r^2 + p_{\bar{r}}^2 + 1)}}\right]$

with $\varphi(\cdot)$ being the standard normal cumulative distribution function and $p_{\bar{r}} = 1 - p_r$ and $p_{\bar{i}} = 1 - p_i$. Equations 1) and 2) summarize the beliefs of the player A (the investigator) and the analyst. p_r denotes the belief of both the researcher and the initiator about whether the target will retaliate. p_i is the researcher's belief about whether player A will impose a measure given the investigator's belief about whether the target will retaliate. They are based on the particular setup of the game; assume utility maximizing behavior on part of the players and uncertainty with regards to the observable components of utility.

Equations 1) and 2) also show that the equilibrium choice probabilities essentially result from two components. First, players' amount of uncertainty given each other's payoffs is reflected in the variance term in the denominator.[7] Second, the differences in observed expected

[6] This can be the case because the two players can't perfectly observe each others' utilities or because researchers do not specify the actors' utilities entirely correctly.

[7] Large values for σ^2 relative to the observable components imply greater uncertainty both for actors and the researcher. The more accurate the information about true utilities, the more similar the model is to a game with perfect and complete information (Signorino/Tarar, p.589).

utilities for the outcomes are given in the numerator. From both the researcher's and the initiator's perspective, the probability that a target is going to retaliate (p_r) depends on the target's observed utility from trade war and its observed utility for not reacting. Hence this example also nicely illustrates why it is the differences in utilities associated with outcomes that matter: the higher the target's observed utility of trade war relative to not reacting, the higher the probability that the target will resort to retaliatory AD measures. The numerator of equation 2) results from the difference between the initiator's expected utility for imposing a new measure and not doing so. From the initiator's perspective, the expected utility of imposing a new measure ($EU_a(I)$) is similar to a lottery with the outcome being either trade war or one-sided protection for domestic producers based on the initiator's beliefs about whether the target will retaliate or not (p_r) and can be expressed as: $EU_A(I) = p_r U_A(TW) + p_{\bar{r}} U_A(P)$. Thus, the higher the initiator's observed utility for the status quo relative to its observed utility for imposing a new measure, the lower the probability that the investigator will actually impose a new measure.[8]

For the empirical analysis, the researcher is assumed only to know the distribution of the private utility components ($\pi_{A/B}$) and therefore the statements about equilibrium choices are probabilistic. This leads to the probabilities for outcomes which can simply be expressed as products of the action probabilities following the path of the game tree. Let p_{SQ}, p_P and p_{TW} denote the probabilities for the status quo, one-sided protection and trade. Hence,

3) $p_{SQ} = p_{\bar{i}}$

4) $p_P = p_i * p_{\bar{r}}$

5) $p_{TW} = p_i * p_r$

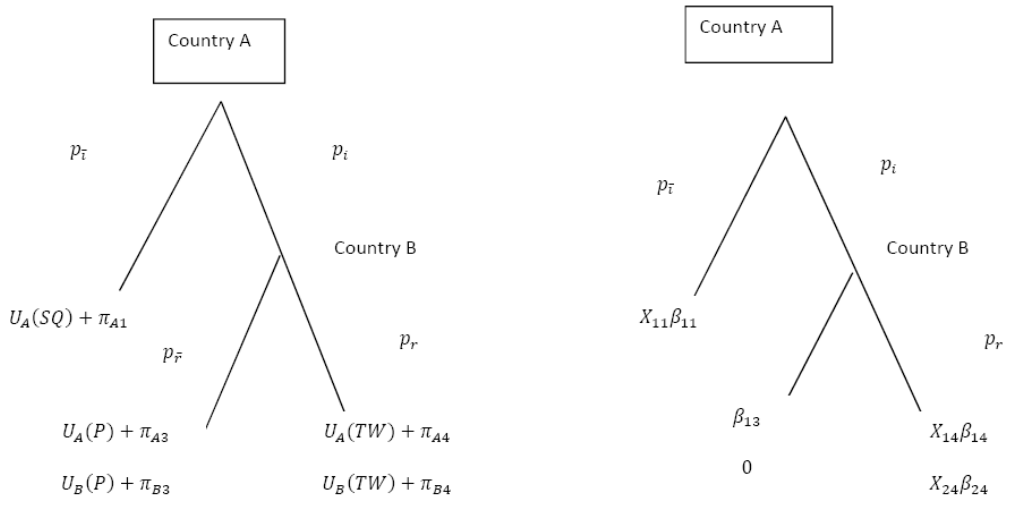
resulting in an equilibrium-based strategic model of AD that can also be used for statistical analysis because it is probabilistic and guarantees positive probabilities for all actions and outcomes as long as there is at least some degree of uncertainty concerning the true utilities.[9] In that sense, the following analysis is based on a unified approach (Signorino/Tarar 2006, p.590).

While the last section has described the relation between the theoretical model and the statistical estimation, this section outlines the specification of utilities for players'. Figure 2 summarizes the general specification. The relation between the observed utility for the status quo and the explanatory variables is described by the linear function $X_{11}\beta_{11}$ with β_{11} denoting a vector of coefficients to be estimated. Similarly, the investigator's utility for getting caught up in a trade war is a linear function of explanatory variables $X_{14}\beta_{14}$. Finally,

[8]From the researcher's perspective. See also Signorino and Tarar (2006), p.589.
[9]This may include uncertainty on part of the players and the researcher.

imposing protection without retaliation is estimated by a constant (β_{13}). As for the target country, its utility of trade war is a linear function of explanatory variables too $(X_{24}\beta_{24})$ while its utility for doing nothing is normalized to zero.

Figure 2: Deriving the Empirical Model



1) The strategic model of AD with uncertainty concerning utilities

2) The strategic model of AD with utilities specified in terms of regressors

Note that parameter estimates include the $\beta's$ and the σ to scale. They cannot be estimated individually as the components are not individually identified. Therefore σ^2 is normalized to one. The next section focuses on defining the sample and explaining the construction of dependent and independent variables for the empirical analysis.

Data and Variables

The unit of analysis is the AD case at the bilateral level, i.e. AD cases are split up into pairs and an investigation in country A for instance concerning imports of steel tubes from B and C counts as two separate cases (AB and AC respectively). Data on AD investigations and outcomes is staken from Bown's Temporary Trade Barrier Database (2010).[10] The analysis covers cases involving WTO members which have an AD law during the years 1995 to 2009. A number of theoretical and empirical reasons motivate the choice of this specific time period and requirements for players. Both actions of A and reactions of B need to be observable and comparable but standardized requirements for data reporting only apply to WTO members

[10] Chad P. Bown originally created the global Antidumping database containing comprehensive and detailled information on AD cases across countries. Note that the data that has been used for calculations reflects information contained in the database as of 2010.The data collected and maintained in the global AD database later became part of the world-bank sponsored TTB dataset which contains information on temporary trade restrictions beyond AD, too. It is available via http://data.worldbank.org/data-catalog/temporary-trade-barriers-database.

who have to notify AD activity. Furthermore, one could argue that nonmembers face fewer restrictions in imposing barriers and retaliating and therefore „do not play the same game".[11] Data before the foundation of the WTO is hardly available for a large set of countries -to some extent simply reflecting the fact that is was less widespread in GATT-times. The foundation of the WTO substantially affected many countries' level of involvement in the global trading system and also brought changes to the AD code. Hence one could argue that it marks a „structural break" and focusing on the WTO period holds the advantage of comparable framework conditions for the further analysis and is empirically by far the more interesting period as a larger group of countries now routinely uses AD.

Outcome variables: The game has three binary and mutually exclusive outcome variables: status quo (SQ), protection (P), and „trade war" (TW). SQ describes a situation where an investigation was started but no final AD duties are being imposed.[12] If the investigation leads to new duties being imposed, it can either end with the target country acquiescing (P) or retaliating (TW). If B takes up at least one investigation against A during a 12 months period following the imposition of duties on its exports, a case is coded as TW.[13] Cases mentioned as evidence for retaliatory activity in the AD literature include both situations where retaliation is observed within and across product/industry categories which suggest a countrywise operationalization of retaliation.[14] The one-year period for observing retaliation reflects that on the one hand preparing and filing an investigation in accordance with formal requirements may require a couple of weeks or months. On the other, if retaliation aims to punish A while at the same time helping B's domestic industry, it should follow relatively promptly –or not at all. In addition, a longer period would result in treating cases as retaliaton that only bear a very distant relationship to previously imposed measures. Hence the one-year period seems a reasonable compromise.[15]

The conceptualization of outcomes differs from previous treatment in the literature which typically concentrates on the first stage of the game, looks at investigations and measures being imposed at a country level but does not distinguish between cases that result in further activity or not (essentially, P and TW are treated equally). At the same time, analyses

[11] Similarly, countries without an AD law face fixed costs to react in the short-term.

[12] A case is coded as SQ if the final decision on dumping and/or injury is not affirmative, which is necessary to impose restrictions. This includes cases that are actively terminated by investigating authorities as well as withdrawn investigations.

[13] Since the coding procedure requires observing activities for a one-year period fter imposition, I only include investigations in the sample that were initiated until end of December 2007, have received a final decision until the end of 2008 where retaliatory activity can be observed until the end of 2009 respectively.

[14] Examples include prolonged AD activity concerning softwood lumber by the US and Canada or China reacting to the imposition of duties on steel fasteners by the EU or exports of car and chicken parts from the US (Bown 2011, p.3). Furthermore, the basic argument that AD is influenced by political factors, too suggests a countrywise rather than sectoral operationalization, too.

[15] Also see Feinberg/Reynolds (2006, p.883): „ (…) most game theory models emphasize the immediacy of retaliation (i.e. within the next year), which is more precisely measure in one-year lagged case filings rather than over a longer time-period."

studying conflict behavior would concentrate on the second stage, i.e. the „conflict situation" and would not consider the previous selection process that is influenced by a strategic rationale. In the final dataset used for estimation, "P" is the most frequent outcome (636 cases, 43.8%), followed by SQ (598, 41.2%) and TW (219, 15.1) being the least frequent (also see appendix for summary statistics).[16]

Examining the initial set of TW cases descriptively already reveals some initial insights: India, the US and the EU feature the largest number of cases here. While the EU and the US are also among the top three targeted/retaliating countries, China is the country with the largest number of cases where it plays the part of the reacting party. Notably, most countries that end up in trade wars are active on both sides of the game. However, five countries only play the part of the targeted/retaliating party (CZE, JPN, POL, PAK, TWN) and Venezuela is only involved in a trade war as investigating country. The five most frequent directed combinations are: 1) USA(A)/CHN(B), 2) USA(A)/EU(B), 3) IND(A)/EU(B), 4) IND(A)/CHN(B), IND(A)/USA(B). The pattern that large economies –both emerging and industrialized- account for the majority of conflictual observations is similar to what has been documented for legal trade disputes (Bown 2009, Guzman/Simmons 2005). While suffering from the empirical fact that hardly any non-democratic country ever initiated a legal trade dispute the literature has frequently noted a stronger tendency for democracies to become involved in legal disputes (Davis/Bermeo 2009, Bernauer/Sattler 2010). TW outcomes involve cases with different regime types and democracies seem to be less "overrepresented" here when looking at the raw numbers.[17]

Independent variables: The mean payoffs of the outcomes are assumed to be linear combinations of the regressors (apart from utilities for P on which restrictions are imposed). Independent variables are selected in order to assess the effect of institutions and include regressors assumed to be systemically associated with outcomes based on the AD literature. These include country characteristics, case characteristics as well as bilateral variables.

Stage 1: SQ utilities for A

Iron_steel is a dummy variable and takes on a positive value if a case concerns iron and steel products.[18] Hansen and Park (1995, p.189/90) argue that steel stands a greater chance of securing AD protection. Steel is an industry typically characterized by high fixed costs

[16] Note that the count of raw cases during the respective period is higher for several reasons. First, a raw count also includes cases that are targeted at non-WTO members. Second, cases coded as retaliation can not be treated as independent units because this would be double-counting. Third, information for outcomes is missing in some cases –albeit for a relatively small number and it does not appear to be systematic. Finally, missing values for independent variables reduce the sample. However, with regards to outcomes, the distribution appears relatively similar.

[17] Certainly, this is affected by China's involmvement in many of the cases classified as trade wars.

[18] The coding is based on HS-code information as listed in Bown (2010). HS codes 72 and 73 are counted as „1".

combined with strong industry concentration, i.e. the incentive to lobby policymakers in times of slump are considerable and collective action problems are easier to overcome. Moreover, steel production is often politically sensitive and seen as linked to national security purposes, which in turn could make it easier to justify protection.[19] Hence, I hypothesize that positive values reduce utilities fort he status quo.

Nme indicates whether the target country is considered a non-market economy. Several authors (Ikenson/Lindsey 2003, Poluetkov 2002, Busch/Reinhardt/Shaffer 2008) have noted that it is easier to impose AD duties on nme-targets as the rules for investigations differ, leave more discretion and hence make it easier to impose measures. In practice, this is particularly relevant for cases investigating imports from China.[20] Given that it is easier to find evidence of dumping and injury if the target is a non-market economy, the hypothesis is that *nme* has a negative effect on the investigating country's payoff for SQ.

Hb_def is a dummy which takes on a value f 1 if A's bilateral trade balance with B is negative. Data on bilateral trade flows comes from Barbieri/Keshk/Pollins (2008) and vaues are lagged for one year. While bilateral trade deficits are not necessarily problematic from an economic point of view, their political perception is generally negative. This could make it easier to impose protection against a trade partner that exports more to than it imports from the investigating country. Hence, the expectation is that a bilateral trade deficit reduces the utility of SQ for player A.

Domestic economic conditions are hypothesized to influence A's valuation for SQ. This is based on the general theoretical link between macroeconomic conditions and protection claimed in various studies (Cassing/McKeown/Ochs 1986, Bagwell/Staiger 2003, Hennisz/Mansfield 2006, Mansfield/Busch 1995)[21] as well as findings specific for AD that suggest an impact of macroeconomic conditions (e.g. Takacs 1981, Leidy 1997, also see WTO 2009 for an overview). Bad economic conditions hinder adjustments on the labor market and make it harder to constantly fend of protectionist pressure (Henisz/Mansfield 2006). If sociotropic voting takes place, the political costs of granting protection can be lower in situations with high or rising unemployment. Actual welfare costs to protection are lower

[19] The Arcelor-Mittal merger illustrated this point. Even though it eventually went through, Arcelor tried to ferociously fend of the bid appealing to economic patriotism. See Economist (2006): „Arcelor up in arms" (http://www.economist.com/node/6859221), „Cast Iron" (http://www.economist.com/node/7064425) and „Heavy Mittal" (http://www.economist.com/node/5468428).

[20] Note that including information on nme-status for a cross-country sample is somewhat difficult because countries differ with regard to their treatment of trading partners considered as nme's (Poluetkov 2002, pp.14). In a first step, I relied on most recent sources in the literature to identify nme's (Busch/Reinhardt/Shaffer 2008: code China, Estonia, Georgia and Hungary, Zanardi?) and checked the current application of nme rules for several large AD users (add ref US and EU). However, given this particular sample which excludes non-WTO members and countries without an AD law, nme-treatment essentially concerns China. Hence, this variable takes a value of 1 if an investigation deals with Chinese imports.

[21] However, see Rose (2012) who claims in a recent article that iproetction isn't countercyclical (anymore).

when the economy does not operate at full capacity. Economic crises may also reduce leaders' accountability in the short-term if the reasons for the slump are poorly understood by the public or can be blamed on third parties. The bottom line following from this is that high unemployment and low growth should reduce the value for SQ. Data for unemployment and growth is based on figures from the World Bank. Note that variables are operationalized as deviations from trend to account for different levels of economic development and catch-up patterns. Hence, positive deviations for unemployment (unempl_A) should reduce the value of SQ and while positive deviations for growth (growth_A) should be associated with an increase respectively.

Stage 2: TW utilities for A and B

W_a denotes the size of the winning coalition in the investigating country and is used to assess the impact of institutions on AD investigations. It is based on data from Polity IV and Banks (2008) and essentially captures whether leaders rely on a narrow elite or a broad majority to remain in power.[22] The composition of their political powerbase in turn shapes leaders' incentives to „provide peace and prosperity".[23] According to Bueno de Mesquita et al. (BdM2S2, 2003), this prompts leaders of large w countries to weigh the decison to go to war more very carefully. Following a similar logic, McLean and Whang (2010, p.436) argue that democratic countries initiating sanctions should be more willing to avoid conflictual outcomes. More generally, leaders in large-w countries want to avoid ending up in a situation which proves costly and unpopular at home as they loose office more easily than those counting on a narrow (but loyal) support base. It has been argued above that a trade war situation represents such a „worst case" outcomes which leaders may want to avoid -and those in large w systems even more so. Higher values for *w_a* are therefore hypothesized to reduce the utility of TW for the investigating country.

Economic size (absolute) takes the (log) value of GDP for A. This is a simple way to operationalize economic power (Guzman/Simmons 2005, p.574) and economic size affects the absolute costs of trade war for the respective countries. A large domestic market should be associated with lower costs for import restrictions and trade war as size gives the ability to influence export prices (Busch/Reinhardt/Schaffer 2008). Bernauer and Sattler (2010) make a similar point arguing that economically powerful states "have an incentive to exploit their power position to implement protectionist policies and are more likely to resist demands for trade concessions". Hence, economic size is hypothesized to affect the valuation of trade war

[22] W is a normalized index that can take on values between 0 and 1. It consists of four elements measuring countries' regime type (Banks), the competitiveness of executive recruitment, the openness of executive recruitment and competitiveness of participation (all Polity; XRCOMP, XROPEN and PARCOMP). For a detailled description of the coding procedure see BdM2S2 (2003) pp.134.

[23] For an extensive explanation of selectorate theory see BdM2S2 (2003) as well as BdM2S2 (2008) for further empirical tests. The moderating effect of large-w institutions on the sanctioning game has been described above.

and lower GDP values should be associated with a reduction of the TW utilities for A.

Economic size (relative) is constructed as a ratio (*ecap*) of both A's and B's (logged) GDP values using data from the World Bank. It can be regarded as a measure of relative economic capabilities.[24] Albeit based on the same underlying data than absolute economic size, the ratio captures a underlying different concept: Drawing on McLean and Whang (2010) who examine the impact of relative military capabilities on the outcome of economic sanctions using a QRE model, the relative differences in market size between the investigator and the target can be interpreted as a proxy influencing the odds of finally „winning" a trade war. Higher values imply that the investigating country can rely on a larger domestic market and is considered economically more powerful relative to the target. At the same time, the ratio contains information about saliency of the conflict. For a small target, it may be harder to lose a big export market whereas the losses to A from restricting imports and suffering additional restrictions imposed by B may be rather small relative to its total economic size. *Ecap* is included in both players TW utilities.

Devdiff measures differences in levels of economic development by including the absolute difference of both countries' (log) GDP values (source: World Bank) in the model. For example, when looking at a case involving the US and China, the variable takes on a considerably larger value (about 5 times) than for the US-EU pair. This variable provides a way to capture potential welfare losses from trade when imposing new restrictions. The idea is that trade conflicts between two countries with large differences in GDP per capita indicates a larger potential loss in terns of trade-related welfare based on classic comparative advantage. Hence, larger values should be associated with lower utility placed on the trade war outcome for both players.

Finally, for B a similar logic as described above should apply for market, i.e. the costs of protection should be lower for countries that can rely on large domestic market. Hence, player B's decision whether to retaliate or not is also assumed to be affected by its absolute economic size as measured by *GDP_B*. Higher values should make retaliation less costly for the target and hence it is hypothesized that *GDP_B* is positively associated with B's valuation for the trade war outcome. Finally, controls for unemployment (*Unempl_B*) and GDP per capita in the target country is included in the analysis.

Table A1 in the Appendix shows summary statictics for the variables used in the estimation.

[24] McLean and Whang (2010) use a ratio of countries' (military) capabilites based on COW-data and include this in their QRE model assessing factors that influence the outcome of economic sanctions. The rationale is that relative strength affects countries' probability to prevail in conflict.

Results and Discussion

The 1 shows the estimation results for the main model.[25]

Table 1: Results of Strategic Probit Regression

Variable	UA (SQ)	UA(P)	UA(TW)	UB(TA)
iron_steel	-0.3475** (0.1082)			
nme	-0.65*** (0.1371)			
unempl_A	-0.04326 (0.02804)			
growth_A	0.05975*** (0.01453)			
trade balance	-0.007083 (0.09846)			
w_A			-5.373*** (1.440)	
ecap			-0.4888** (0.1945)	0.3005*** (0.04222)
devdiff			0.4348** (0.1602)	0.1828** (0.06399)
GDP_A			0.9331** (0.2876)	
GDP_B				0.7682*** (0.07836)
unempl_B				-0.0553 (0.06167)
GDPpc_B				-0.1329** (0.06363)
Constant	23.41** (8.545)	23.93** (8.647)		-21.31*** (1.949)
N	1453			
PCP outcomes: 55.6				
PCP SQ: 51.3; PCP P: 59.4; PCP TW: 55.2				

Standard errors are shown below parameter estimates. ***p<0.001, **p<0.05,*p<0.10.

The model predicts about 55.6 percent of outcomes correctly yielding a 12-13 percent improvement compared to the most frequent outcome in the sample. However, given the relative lack of previous large-n analyses that consider strategic interaction and the still limited understanding, the results may nevertheless provide useful new insights to the drivers and dynamics of trade wars.[26]

To briefly summarize the main findings, the results for the first stage suggest that AD investigations are more likely to end with new measures if they concern steel cases, the target is a non-market economy and the investigating country suffers from low growth. All three

[25] In addition, a number of robustness checks involving alternative specifications were conducted. These include alternative specification of business cycle variables, estimating the model for different subsamples and assess the robustness of results when leaving out several different countries.

[26] At the same time, it extends the number of analyses that use QRE-estimation for non-simulated data and a relatively large sample.

effects are quite intuitive, provide support for the hypotheses and point to trends that are in line with previous research -albeit based on different models and samples. However, neither the results for unemployment nor a bilateral trade deficit seem to affect the valuation of SQ significantly.

Turning to findings for the TW outcome, results for *w_A* support the theoretical argument outlined, i.e. a larger winning coalition seems to reduce the value associated with TW for the investigating country. Economic size performs as expected for both players: smaller economies attach lower values to TW as their unilateral costs of ending up in a trade war are higher. The economic capabilities ratio and *devdiff* influence the utility the investigating country places on TW. However, their effect turns out to be different than expected. Results suggest that a higher value of *ecap*, i.e. a situation in which the investigating country's economy is larger than the target's, effectively reduces the value of trade war for the investigating country. Similarly, differences in levels of development apparently tend to increase the value the investigating country places on the trade war outcome.

As for the target's utilities, both *ecap* and *devdiff* affect the valuation -but again the direction is different than hypothesized. Higher values for the economic capability ratio appear to increase the target's utility for the TW. This would suggest that the target should be more likely to retaliate in a situation when it faces a standoff with a larger trading partner. As for *devdiff*, the effect points in the same direction as for the investigating country, i.e. the target appears to receive higher utility from TW when the differences in levels of development are large. This seems clearly at odds with the logic emphasizing the opportunity costs of foregone welfare gains from comparative advantage.[27] Several explanations are consistent with this pattern. First, this could indicate that trade between similar countries is in fact valued more than traditional trade driven by comparative advantage, as suggested by new trade theory. Second, for developed economies, trade with developing countries typically involves the import of labor intensive products which could be politically more problematic despite the economic benefits (Perkins/Neumayer 2007). Alternatively, developing countries could target imports from developed economies for industrial policy reasons and therefore also be more willing to fight back. In addition, Prusa/Skeath (2002, 2004) suggests that new users, which are often developing countries, are more willing to target developed economies to "punish" them for previous use.

Economic capabilities also affects the target's valuation of trade war but the results suggest that the target is more likely to resort to retaliatory measures when the investigating country

[27] Recall that the variable is based on the absolute differences in per capita income between investigating country and target. Hence, it does not differentiate between developed countries increasingly targeting developing countries or vice versa. However, it suggests that ceteris paribus for a case concerning similar countries (e.g. EU-USA or USA-EU), both the investigator and the target place a lower value on trade war than for a case with one country being a developed and the other being a developing country (e.g. CHN-USA or USA-CHN).

is relatively more powerful. This result points in a similar direction as research by Guzman and Simmons (2005) who study the selection of defendants in trade disputes. Similarly, they do not find empirical support for a power-based logic, which would suggest that economically less powerful countries refrain from pursuing complaints against powerful trading partners. Rather, their findings suggest that weak targets of unfair trade restrictions do seek recourse against powerful complainants. The authors argue that capacity restrictions in fact drive economically less powerful countries to concentrate on „high reward cases. The decision to react to imposed AD restrictions via vigilante justice could follow a similar logic. This would accord with a saliency-interpretation of the economic capabilities measure. However, for a more detailed interpretation, the effect of the independent variable on the probabilities for outcomes needs to be examined in greater detail. This is done in the next section when looking at the marginal effects.

Finally, the unemployment variable does not appear to affect the target's valuation of outcomes either. However, results suggest that countries with higher per capita income place a lower value on TW and hence should be less likely to opt for vigilante justice. One possible explanation could be that variants of infant industry policies/state capitalism, which may include promoting domestic producers through active protection as well as retaliation, tend to be less popular in developed economies. However, they still play a role in emerging markets particularly in combination with strong ties between business and policymakers (Fisman 2001 on the value of political connections in general and Li/Meng/Wang and Zhou 2008 on the value of political connections in China).

Examination of the marginal effects

a. Discrete variables

A substantial interpretation of discrete choice models requires further examination of the marginal effects. Strategic probit analysis allows to assess the effects of independent variables on all three outcomes at the same time.[28] While marginal effects are typically affected holding all other variables at their means, the analysis follows Signorino and Tarar (2006) holding the other variables constant at different levels to get a more nuanced picture of the effects. For the sake of brevity, the analysis below concentrates on the variables which have shown strong results and are of main theoretical interest.

Table 2 summarizes the effect of *nme* and *iron_stee*l on the probabilities for the three outcomes.

[28] Note that the variables can have a direct and an indirect effect depending on where they enter the model. Variables such as nme status have a direct effect on the utilities for the outcomes. Variables only included in the target's utilities nonetheless affect the investigating country indirectly through shaping its beliefs about possible reactions. Variables that enter for both the investigating country and the targez have both a direct and an indirect effect. Also see Signorino/Tarar (2006) for a more detailled discussion.

Table 2: Marginal Effects for Steel and non-market economy status

	minimal			low			mean			moderate		
	SQ	P	TW	SQ	P	TW	SQ	P	TW	SQ	P	TW
Bin=0	.199	.80	0	.357	.633	.01	.431	.446	.123	.649	.108	.243
Iron_s=1	.138	.862	0	.269	.719	.012	.354	.51	.14	.542	.141	.317
Nme=1	.096	.904	0	.203	.784	.013	.277	.567	.156	.446	.17	.384

Note: The minimal scenario refers to an investigation where the discrete variables take on values of zero, i.e. the case does not concern steel products, the target is considered a market economy and the investigating country has no bilateral trade deficit with the target. The other scenarios refer to the first, second and third quartile respectively.

Cases concerning steel products seem to be pursued more aggresively. Regardless of the values of the other variables, they always have a lower probability of ending without new measures compared to the baseline. Take the minimal scenario as a benchmark: P is the most likely outcome here (.8) and trade wars don't occur according to the model but when the case involves steel products, imposing protection becomes 6 percentage points more likely. The effect on TW only kicks in for scenarios with higher values. For example in the moderate case, TW is about 7 percentage points more likely compared to the baseline scenario. The finding that steel cases tend to be more conflictual -more likely to end with proetction and to trigger retaliatory responses- suggests support for the theoretical hypothesis and points to idiosyncracies of the global steel market. A few concentrated steel producers can make a strong case for protection domestically –potentially also linking their plea to national security concerns. At the same time, competition on the steel market is essentially global and firms fight for market share. This should raise the potential for escalation compared to other product categories.

Cases which investigate nme's similarly show a higher probability of ending with measures in each of the different scenarios. For example in the minimal scenario, a case not targeting an nme is more than twice as likely to end in the status quo outcome (.199 compared to .096). This pattern is similar to arguments put forward by Ikenson and Lindsay (2003) and results of Busch, Reinhardt and Schaffer (2008) who find that nme-status makes implementation of measures more likely for investigating countries with large domestic markets that are new AD users. Kang and Park (2011) have also documented an effect of nme status on AD cases in Korea. Altogether, the marginal effects for nme are similar to those observed for steel with the probability of measures being imposed and cases escalating into trade war being systematically higher throughout the different scenarios. The role of China -both as a frequent nme-target and as retaliating party- is of key importance here. Due to the specificity of the sample, it is not posible to disentangle the „true" nme effect (i.e. any difference in treatment due to different rules applied in the investigation process) from any „China-

specific“ effect and interpretation therefore needs to be cautious. Results could signal greater leeway being applied to nme investigations resulting in higher imposition rates as well as nme-target's -often countries in an economic catch-up phase, undergoing substantial transformation while ties between governments and firms are still prevalent- greater willingness to retaliate *in general*, i.e. findings largely based on China would be symptomatic for a larger group here, or this could be treated as a specific effect. However, even when opting for a narrow interpretation, findings remain interesting as trade with China concern a considerable amount of global trade volumes and the country is certainly at the centre of global AD activity today. [29]

Recent Chinese attempts to revoke nme-status by offering financial aid to several european member states caught up in debt-problems may point to a more rules-based interpretation.[30] Apparently the country itsself seems to care about its *de jure* nme status and expects less problems for its exporters if nme-treatment is ended. In a sense, this could even be interpreted as a signal of trust in a global rules-based trading system. At the same time, retaliatory activity involving China may give rise to concerns as immediate reaction (or the threat thereof) indicates how AD is used to help domestic industries and attain firms' global market share. US AD duties against imports of solar panels and the threat of Chinese retaliatory action[31] as well as a similar case looming with the EU (again including swift warnings of retaliation) are only some recent examples here.[32]

b. Continuous variables

The graphs below display the effects for w_a and the economic capability-ratio.[33] I focus on these two because the role of institutions and the effect of the economic capability ratio are of major theoretical interest and the latter also shows interesting non-monotonous effects that would not easily be discernible using traditional discrete choice models.

[29] Most recent data from the WTO (until end of 2011) cites 853 AD investigations and 630 measures have targeted exports from China since 1995, which makes it the most frequent targets. In addition, since joining the WTO, China has also become an active user of AD measures (191 investigations and 151 measures). Source for most recent AD figures: WTO. Serveral chapters in Bown (2011) review current trends in the use of temporary trade barriers (and AD as part thereof) by country and note the central role of China as an AD target for both developed and other emerging economies.

[30] China has recently offered financial aid to several member states and demanded lifting its nme-status in return (Spiegel (14.09.2011): "China bietet Europa und USA Finanzspritze an").

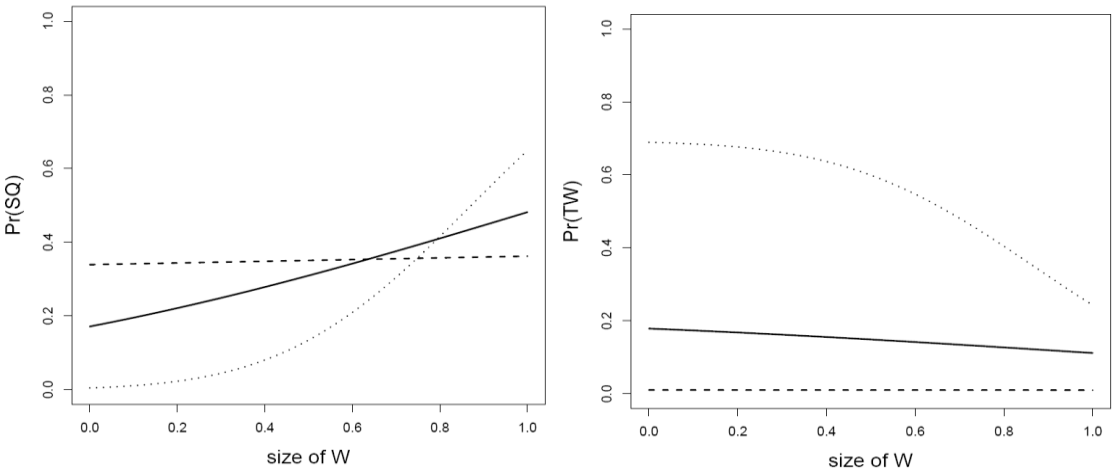
[31] http://www.guardian.co.uk/world/2012/may/17/us-tariffs-chinese-solar-panels

[32] http://euobserver.com/economic/117084

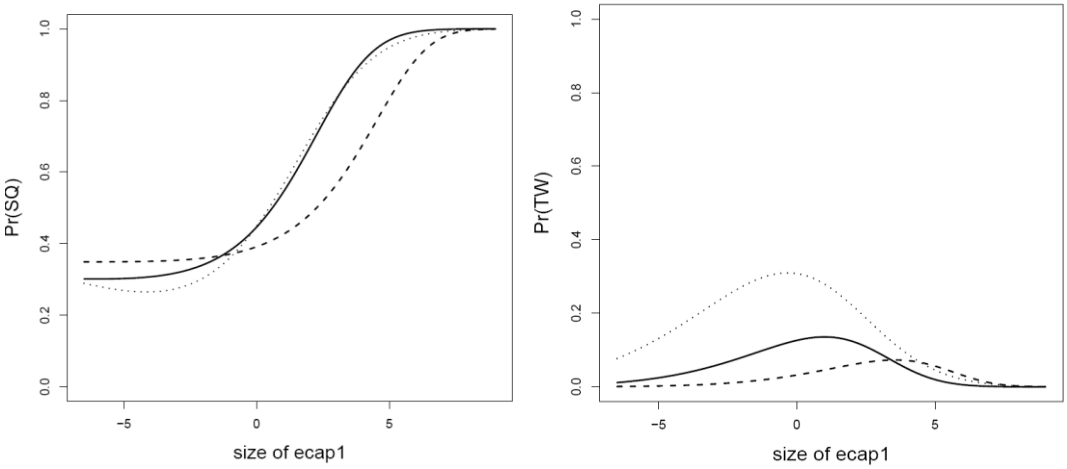
[33] Graphs for the other variables can be found in the appendix.

Figure 3: Effects of the winning coalition and relative economic size

a) b)



c) d)



Note: Straight line=mean, dashed line=low (.25), dotted=moderate (.75) scenario for independent variables.

Figures 3.a) and b) show how the size of A's winning coalition affects the probability for SQ and TW. Recall that estimation results (table 1) indicate a decreasing effect, i.e. that larger winning coalitions reduce A's valuation fort he TW outcome. Notably, the graph reveals that the strength of this effect varies depending on the values of the other independent variables.[34] Albeit almost non-existent for low values, the effect shows quite strongly for median and moderate values of the independent variables. For example, the probability of observing SQ for a hypothetical country of the mean category and a winning coalition of .25, i.e. a country that typically would not qualify as a well-functioning democracy. In this case, the probability of observing SQ is only about 20 percent while for a country with a winning coalition coded at

[34] It cannot be excluded that the divergences are due to the structure of the sample. Basically this seems to suggest that domestic institutions "matter more" when all other variables take on high values. However, it should be noted that the categories refer to hypothetical combinations.

maximum values, such as New Zealand or Australia, chances are almost 50 percent that an investigation will not end with new measures being implemented. Similarly, large values for w decrease the probability for trade war. This effect is particularly strong when the other variables take on large values. While TW is generally more likely here, the probability of ending up in a trade war for a country with a small w is almost three times as large as for large-w countries (decrease from more than .6 to about .2).

The monotonic reduction for the probability of TW is in line with the main theoretical hypothesis. Larger winning coalitions are associated with larger domestic costs of getting caught up in a trade war and hence investigating countries tend to be more cautious at the implementation stage. Note that the reduction in the probability of TW goes hand in hand with an increase for SQ, which suggests that this is really about investigating countries becoming more cautious and selecting cases more carefully rather than the target simply not reacting.

Graph 3 c) and d) show that the effect of economic capabilities on probabilities for outcomes is non-monotonic. Recall that *ecap* is constructed as a ratio of the two players' (logged) GDP values and hence approaches a value of one for AD cases involving countries of similar economic size as investigator and target.[35] Estimation results have indicated a negative association between *ecap* and the utility the investigating country attaches to the TW outcome and a positive association for the target (see table 1). The graph shows that the effect of *ecap* on outcomes follows a largely similar pattern even if values for the other independent variables differ. Consider first the impact of *ecap* on probabilities for SQ: higher values are associated with a considerable increase. Given very high asymmetries the investigating country hardly implements additional restrictions and the case is very likely to end with SQ. This effect is relatively similar across scenarios except that it kicks in somewhat later when variables take on high values. The effect of ecap on the probability of TW is somewhat more complex. While the probability for trade war is almost nonexistent for low values of the explanatory variable, it increases first but then drops again as the investigating country's economy becomes much larger relative to the target. For moderate and mean values of the independent variables, the probability of a trade war is highest in the area where both parties involved are almost equal in terms of market size.

A possible explanation for this pattern could be that with very low values of *ecap*, i.e. the target is a much larger economy, the probability of trade war is literally zero exactly because the target does not care too much about A imposing barriers as any loss would be small and/or can be easily offset, therefore B does not react. The small investigating country may

[35] A's economy is larger than B, then ecap takes on values larger than 1 and if B's economy is larger than A'a, ecap is smaller than 1 respectively. Since the value is logged after dividing the two values, combinations with A having a lower GDP than B take on negative values and combinations with A being a larger economy than B take on positive values. If both economies are of equal size, *ecap* takes on a value of 0.

anticipate this and consequently is likely to impose a measure sensing that it will get away with it. Therefore the probability for SQ is rather low and one-sided protection the most likely outcome in this constellation (about 2/3). Yet with *ecap* increasing, B starts to worry about restrictions imposed by A. At the same time, the threat of retaliation becomes more virulent for the investigating country. Hence, the investigating country starts getting more cautious –and the probability of SQ goes up. In a situation with A being much stronger than B, trade war again becomes highly unlikely. Possibly, here it is the investigating country that does not really care about these cases or doesn't want to be perceived as „picking" on small trading partners or overusing restrictions, which is why they are relatively likely to end with the SQ.

Concluding Remarks

Although strategic interaction is fundamental to international trade relations, empirical analyses that focus on the imposition of trade barriers as the outcome of a strategic process and incorporate the structure into statistical models are still relatively rare. This paper examines the use of AD measures, one of the key trade barriers today, from a strategic perspective, i.e. expectations about possible reaction of the target are hypothezized to impact the investigating country's behavior. The analysis yields several interesting findings and provides new insights that would not have been apparent with standard nonstrategic modelling techniques.

First, the finding on institutions is in line with the logic of the sanctioning model and provides support for one of the key claims of BdM and the logic of selectorate theory. This suggests that the argument may be applicable to other forms of non-militarized conflicts as well. According to selectorate theory, small winning coalitions should be associated with lower sensitivity to losses in case of conflict and a stronger tendency to privilege a narrow elite. Against this background, findings of this analysis square well with recent observations from Bown (2011) who mentions that Chinese AD cases seem to involve a relatively small number of petitioners per case. However, examining closer who benefits from protection and in how far these groups represent relevant stakeholders to keep leaders in power remains one of the challenges for future research applying the conceptual framework of selectorate theory. In addition, the findings of this analysis help to enhance our understanding of the cross-country determinants of AD where empirical evidence on institutional variables has so far been scarce.

Second, I find that steel cases tend to be particularly contentious, i.e. they have a higher probability of ending with new trade restrictions and/or leading to trade wars. The same goes for AD cases targeting non-market and hence provide fresh support for some patterns frequently mentioned in the AD literature. The finding on nme's is particularly relevant with respect to China -both because it is China that drives the empirical result *and* trade with

China plays a key role for many countries today. Hence, patterns and frictions also matter for the trading system at large. Two policy implications can be derived from this: while the use of nme-rules is certainly warranted under specific conditions, they can get „overused“ easily. Hence, cases should be examined carefully and nme-status periodically reassessed by China's trading partners. At the same time, frequent reaction and the high incidence of TW outcomes involving China draws attention to domestic policy practices. During the period investigated in this analysis, China's AD law featured an article that provides for active retaliation and which has been challenged legally by the EU in 2010.[36]

In addition, actively and openly using (or threatening to use) AD for retaliation could easily backfire. Trade partners may take this as confirmation of their beliefs that government support for domestic firms is (still) paramount and beyond „acceptable“ level. Hence, they may be reluctant to revoke nme-status to retain more leeway or they may even take this as a reason to reconsider their own rules. For example, a recent public consultation launched by DG trade has identified retaliatory threats as one of the main problems and gathers input on how to better counter them in the future.[37]

Finally, findings on the economic capability ratio are interesting because they suggest that effects are not monotonically linked to the likelihood of trade wars. This result has interesting methodological implications, as it would be difficult to discern using traditional modelling techniques.

However, there are several ways to improve and possibly further extend this analysis. More fine-grained operationalization of some variables, e.g. including data on capacity utilization or sectoral employment figures, as well as testing the model for different sub-groups of cases may be useful to better trace the underlying logic and to improve the model fit. In addition, the model certainly does not depict the entire interaction. Therefore selection effects can not be entirely ruled out even though the findings appear overall plausible. The model could for

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[36] Art.56 stipulates that "where a country (region) discriminatorily imposes anti-dumping measures on the exports from the People's Republic of China, China may, on the basis of actual situations, take corresponding measures against that country (region)". Source: WTO http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds407_e.htm

[37] The European Commission held a public consultation on the modernisation of trade defense instruments. Threats od retaliation are identified as one of the key issues and trade commissioner Karel de Gucht explicitly linked this to the rise of emerging economies reying on models of state capitalism: *„Another change is linked to the rise of what has been called state capitalism. It is frequently used to describe China's system but it can also be applied to Russia, Vietnam and other emerging economies. It has two consequences for trade defence. First, it implies that a range of government policies could be used to give an unwarranted competitive advantage to a national company – from cheap finance to cheap raw materials. This kind of distortion can be difficult to prove in a legal process such as ours. Second, it raises the issue of retaliation. This is a difficult and sensitive topic. But it is undeniable that many European companies are unwilling to come forward and make justified trade defence complaints due to fear of consequences for their business. The consequences can be serious for companies that export to or invest in the country in question. In our current system it is not clear how we ensure these companies have a fair shot*."
Questionnaire for stakeholders is available at:
http://trade.ec.europa.eu/doclib/docs/2012/april/tradoc_149300.doc.pdf

instance be extended to include a provisional decision stage fort he investigating country (as well as the possibility to threaten retaliation at an earlier stage). Finally, this analysis exclusively focuses on the investigation and implementation stage but AD measures are designed as *temporary* trade barriers and need to be reviewed after a certain period. Whether (and after what time) they are effectively abolished could be an interesting area for further research. Duration and removal is important because it similarly provides for the possibility to discriminte selectively against trading partners –and some scholars note that again some countries suffer longer from measures than others here too (Prusa in Bown 2011). Notably, it seems that during the recent economic crisis some countries have responded with prolongation rather than more new measures (Bown 2011). An analysis of removal patterns could provide an interesting extension to test for the effects of institutions on patterns of screening as well as the possibility to further examine strategic interaction.

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Appendix

1. Derivation of comparative Statics

Comparative statics can be derived to show how changes in the parameters affect the solution of the model. Let $\tilde{p}$ denote the threshold probability of facing a passive target which encourages player A to impose a measure. The comparative static question of interest here is how changes in IG_{IC}, IG_{EX} and D affect $\tilde{p}$, i.e. how large the expected probability of facing a passive target has to be in order to impose a measure. Based on the payoffs set out in figure x.1, player A imposes a measure if

$$\tilde{p} > \frac{IG_{EX} - IG_{IC} + D}{IG_{EX}}$$

Deriving the effect of a change in D yields:

$$\frac{\partial \tilde{p}}{\partial D} = \frac{1}{IG_{EX}}$$

Increasing D is associated with higher values for $\tilde{p}$, i.e player A needs to be more certain that the target will remain passive in order to impose a measure. In other words, the more the domestic sector feels aggrieved due to welfare costs, the more cautious leaders should be to give in to pressure for protection.

Similarly, $\tilde{p}$ drops if import competing interests gain strength.

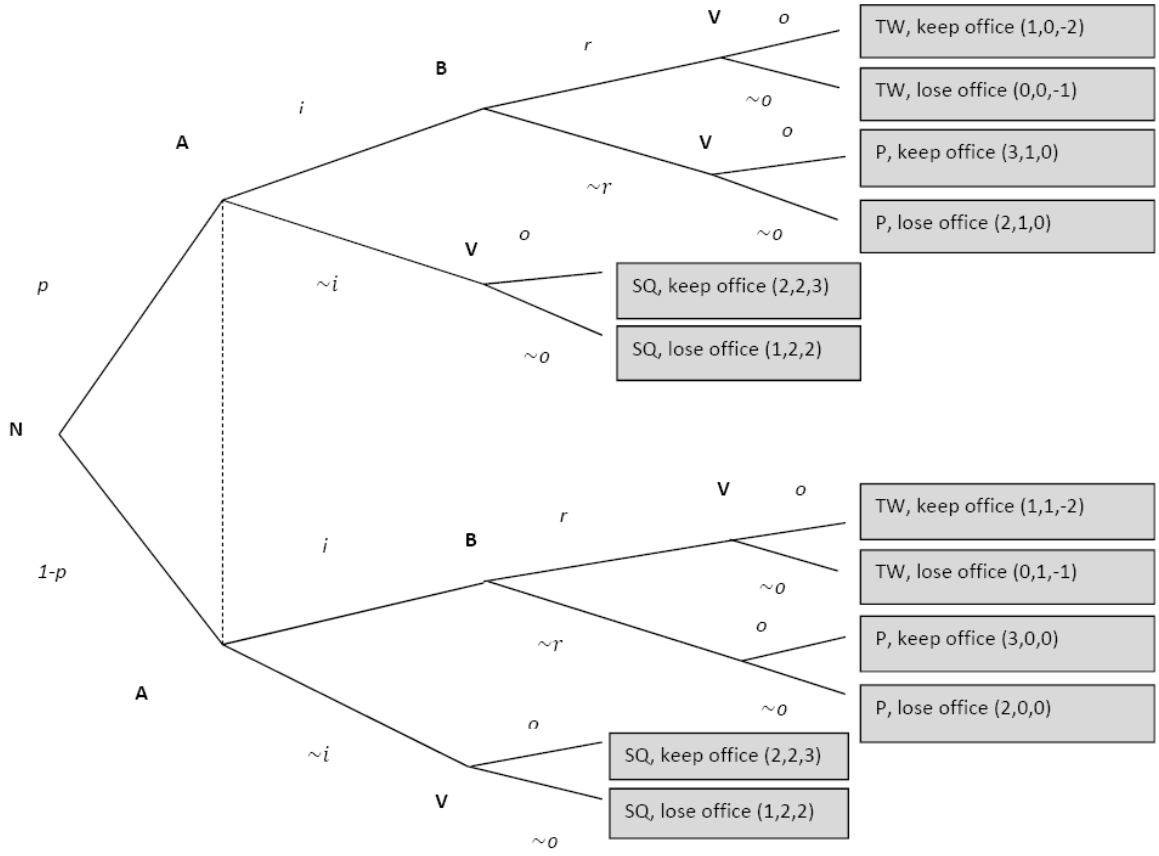
$$\frac{\partial \tilde{p}}{\partial\, IG_{IC}} = -\frac{1}{IG_{EX}}$$

Finally, given a situation where player A's utility gain from supporting the import-competing industry outweigh the costs due to welfare losses -arguably the most interesting case- increasing the political clout of exporting industries is also associated with higher values for $\tilde{p}$.

$$\frac{\partial \tilde{p}}{\partial IG_{EX}} = \frac{IG_{IC} - D}{IG_{EX}^2}$$

Thus greater political clout of exporters is c.p. associated with a less activist stance to AD measures and in turn cases should be more likely to end with the status quo.

Hence, this simple game illustrates how trade policy decisionmaking is affected by both domestic distributional conflicts about trade and international interaction. In a second step, the model can be extended to show how domestic political institutions affect this calculus. The extended game is depicted in figure 3 using sample payoffs for illustration.


N
p
1-p
A
A
i
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r
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TW, keep office (1,0,-2)
TW, lose office (0,0,-1)
P, keep office (3,1,0)
P, lose office (2,1,0)
SQ, keep office (2,2,3)
SQ, lose office (1,2,2)
TW, keep office (1,1,-2)
TW, lose office (0,1,-1)
P, keep office (3,0,0)
P, lose office (2,0,0)
SQ, keep office (2,2,3)
SQ, lose office (1,2,2)

2. Descriptive Statistics-Table A1

Summary statistics for complete final sample (without missing values) –basis for results in Ch.4

Table A1

N=1453

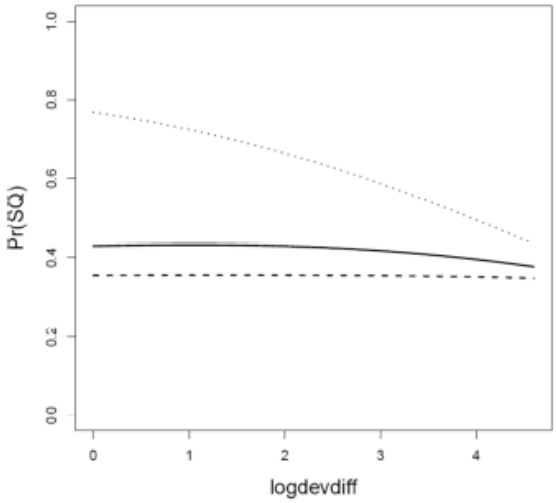
Variable	Min	1st	Median	Mean	3rd	Max
SQ	0	0	0	0.4116	1	1
P	0	0	0	0.4377	1	1
TW	0	0	0	0.1507	0	1
Nme	0.0000	0.0000	0.0000	0.1693	0.0000	1.0000
Iron steel	0	0	0	0.2498	0	1
Unemployment trend A	-8.52308	-0.49231	-0.02308	0.10907	0.80769	6.14615
Growth trend A	-17.5259	-0.9153	0.5866	0.1013	1.6235	9.5654
W A	0.2500	0.7500	0.7500	0.8592	1.0000	1.0000
Hb deficit	0.000	0.000	1.0000	0.6882	1.0000	1.0000
Log GDP A	22.62	26.25	26.82	27.34	29.79	30.32
Log GDP B	21.04	25.87	27.36	27.53	29.24	30.32
E cap	-6.4831	-2.4546	-0.3756	-0.1920	1.6714	8.8815
Log dev diff	0.001699	0.631673	1.284274	1.513124	2.221209	4.518329
Unempl trend B	-5.1923	-0.2769	0.4077	0.2884	0.7077	7.4167
Unempl A	0.900	4.700	7.700	9.293	10.415	31.200
Unempl lagged A	1.100	4.700	7.700	9.105	10.500	31.200
Industry va A	22.03	26.13	28.42	30.12	31.98	52.97
Growth A	-13.127	2.308	3.800	3.488	5.233	12.822
Growth lagged A	-13.127	1.234	3.116	2.885	4.548	12.670
Exports B	6.567	22.600	32.018	34.401	38.564	243.436
W B	0.000	0.000	0.7500	0.7919	1.000	1.0000
openasym	0.0000	0.0000	1.0000	0.5547	1.0000	1.0000
Log GDP pc A*	5.974	8.201	9.071	9.081	10.066	10.537
Log GDP pc B*	5.931	7.385	8.530	8.667	9.856	10.592
Lsk press	0.0000	0.0000	1.0000	0.6208	1.0000	1.0000

Note: Grey-colored rows summarize variables that are used included for robustness checks.

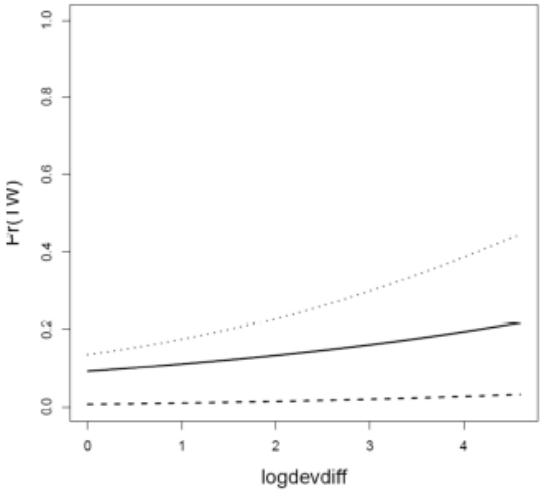
3. Effects for other continuous Variables

Note: Straight line=mean, dashed line=low (.25), dotted=moderate (.75) scenario for independent variables.

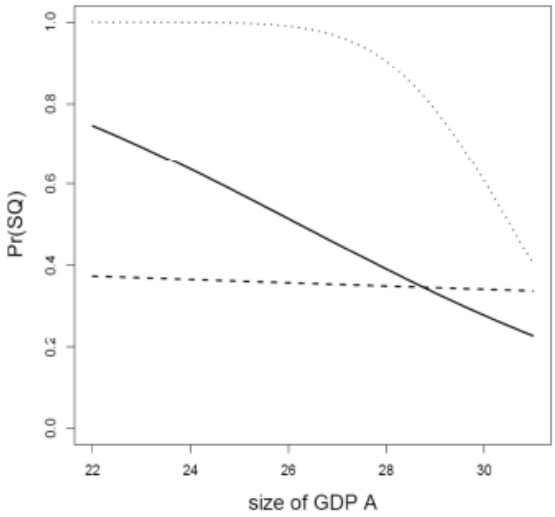
a) Effects of devdiff on P(SQ)



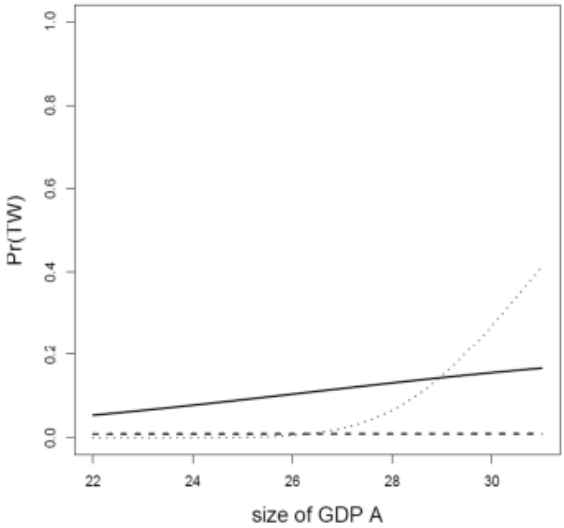
b) Effects of devdiff on P(TW)



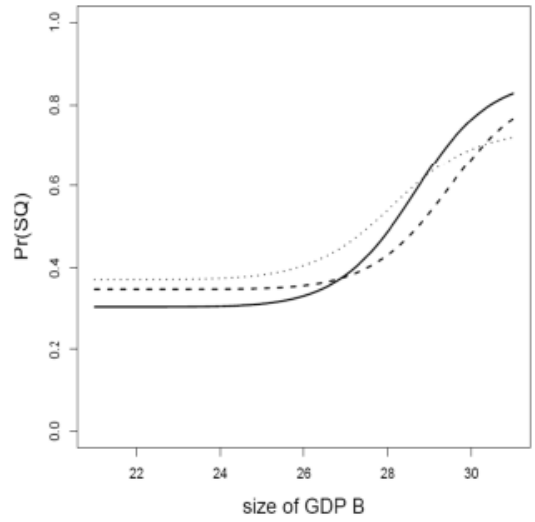
c) Effects of GDP A on P(SQ)



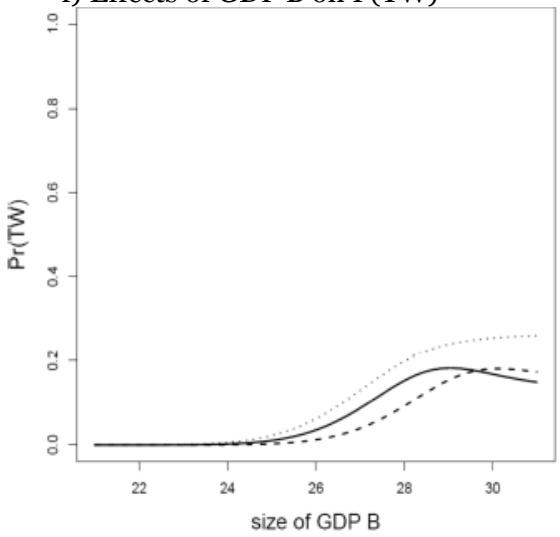
d) Effects of GDP A on P(TW)



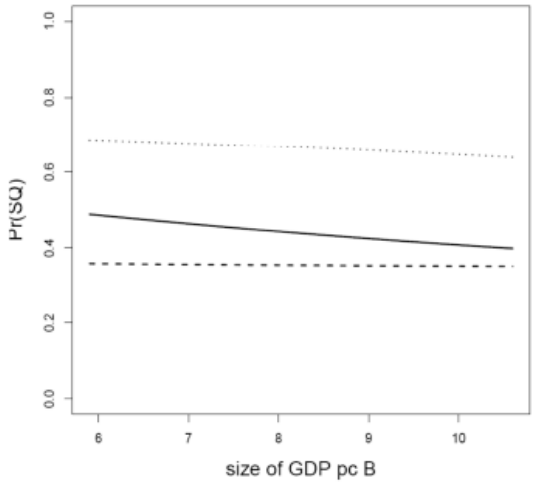
e) Effects of GDP B on P(SQ)



f) Effects of GDP B on P(TW)



g) Effects of GDP pc B on P(SQ)



h) Effects of GDP pc B on P(TW)