THE RESORT TO PROTECTIONISM DURING THE GREAT RECESSION:

WHICH FACTORS MATTERED?[1]

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Abstract:

A dataset of state measures implemented between November 2008 and October 2010 that discriminate against foreign commercial interests is used to estimate the determinants of the resort to protectionism by governments during the Great Recession. A well known theory of protectionism is found to be systematically at odds with one important aspect of the data: the more protectionist measures a jurisdiction's government has implemented, the greater the theory under-predicts the amount of discrimination against foreign commercial interests. The extent to which this unexplained variation can be accounted for by other corporate and official factors are then examined.

[1] We thank participants in a Brown Bag seminar at the University of St. Gallen for their comments at an early stage in this research project. Comments from participants at a recent World Trade Organization (WTO) seminar were appreciated as well. Particular thanks are due to Conny Wunsch, Mark Schelker, and Marcelo Olarreaga. All remaining errors are our own.

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1. Introduction

During the Great Recession (2007-2009) governments resorted to protectionism.[3] To what extent did these policy choices accord with our understanding of the theory of trade policy determination? To what extent did international institutions--be they formal, such as the World Trade Organization (WTO) or informal, such as international supply chains--condition the resort to protectionism? Did the availability of other macroeconomic tools limit the resort to protectionism during the Great Recession as they may have done in the 1930s (Eichengreen and Irwin 2009)? In sum, do analysts need to revisit their priors about protectionism in the light of recent circumstances?

These questions indicate what could be at stake--not only our understanding of the determinants of trade policy but also the bite of contemporary commercial and international institutions. Realistically, while no one paper is likely to transform views on these matters, given the considerable energies devoted to developing novel theoretical predictions on related matters over the past 20 years as well as the collection of a detailed new dataset on protectionism during the recent global economic downturn, after the shock provided by the Great Recession the time may be ripe for analysts from economics, political science, and international relations to revisit leading presumptions in the literature on trade policy choice.

[3] Defining what policy instruments are protectionist is not straightforward. Our starting point is to consider protectionist policy instruments whose implementation discriminates against foreign commercial interests in favour of some or all domestic rivals, irrespective of the stated intentions of the policymaker. Note this definition makes no reference to legality of the measure, under WTO accords or domestic law. Discrimination--that is, altering the conditions of competition to the detriment of foreign commercial interests--is the test. Note also that, in principle, this definition could include policy instruments other than those traditionally associated with trade policy, namely, tariffs, quotas, and contingent protectionism. The advantage of taking such a broad definition is that it recognises that governments have many tools available to discriminate against foreign commercial interests; while any advantages of constraining analyses to state measures subject to international accords are not obvious. Moreover, "foreign commercial interests" are deliberately referred so as to include possible consequences of state measures for foreign traders, investors, migrants, as well as owners of intellectual property; a broader scope being consistent with an integrating global economy.

The above approach does not settle every matter; important wrinkles arise. For example, the implementation of free trade agreements (FTA) discriminate against some foreign commercial interests while benefiting others; should FTA negotiations be included as protectionist measures? So as to avoid the controversy associated with free trade agreements, the dataset of contemporary protectionism used in this paper does not include state measures associated with the negotiation of free trade agreements. Another area of difficulty concerns technical barriers to trade (TBT) and sanitary and phytosanitary measures (SPS), which many regard as being motivated by health and safety concerns. Only if the implementation of a TBT or SPS measure can be shown to be unnecessarily discriminatory is it included in the dataset used here, or if there is a substantial change in legal or administrative regime towards TBT and SPS measures that could introduce or extend discrimination against foreign commercial interests. As of December 2010 the Global Trade Alert database, the source from which the dataset for this paper was extracted, included just 23 SPS and 17 TBT measures out of a total of 1413 reports on state measures implemented since November 2008.

Using data collected by the independent Global Trade Alert (GTA) initiative[4], with which the authors of this paper are associated, in this paper the extent to which each jurisdiction[5] resorts to protectionism during November 2008-October 2010 is contrasted with the predictions of theoretical benchmark derived here for the purpose from the canonical Grossman Helpman (1995) model of trade policy determination.

While this sophisticated framework accounts for several factors thought to simultaneously determine policy choice, no role is played by trade agreements, international initiatives such as the Group of 20 nations (G20), and commercial developments, such as international supply chains.[6] We will be interested in examining how much of the variation unexplained by the Grossman Helpman (1995) model can be accounted for by these latter factors.[7] Moreover, it should be possible to compare the degree to which different sets of explanatory variables account for the unexplained variation. While the latter statistical analysis does not allow for a structural interpretation of the parameter estimates, at best it might indicate where further theoretical refinements might profitably focus.

Another distinctive feature of our approach is to eschew what might be termed the "dummy variable" approach to estimating the impact of membership of international institutions. Rather than estimate, for example, the average impact of WTO membership (an approach Rose 2004 did much to popularise) we state and evaluate eight hypotheses through which WTO membership might influence the resort to protectionism during the Great Recession. It turns out that the extent of obligations undertaken by WTO members varies a lot as do their economic circumstances. Consequently, wherever possible, we employ continuous variables or interaction terms to identify the impact of different consequences of WTO membership.

[4] Further information about which can be obtained from: http://www.globaltradealert.org/ The dataset assembled as a result of this initiative is updated whenever reports in the GTA database are amended or augmented. The dataset is freely available in four formats at the following website: http://www.globaltradealert.org/data-exports For further information about the data collection methods of the GTA team see Evenett (2009), obtainable at http://www.globaltradealert.org/gta-analysis/what-can-be-learned-crisis-era-protectionism-initial-assessment Questions concerning the GTA dataset can be sent to the corresponding author listed on the first page of this paper. More information on this dataset can be found in section 3.2 of this paper.

[5] The emphasis on jurisdiction, rather than nation, is that some sub-national entities have control over the flow of commerce across their borders. In WTO parlance such entities are known as customs territories. The unit of observation in the GTA database are customs territories.

[6] This is a statement about the Grossman Helpman (1995) model. Of course, extensions to that model to allow for trade agreements and trade in intermediate goods have been developed. In this regard, we have nothing to add to Goldberg and Maggi's pertinent comments on the difficulties in estimating the extension to take account of so-called trade talks.

[7] There are strong parallels here to one element of the empirical strategy pursued by Goldberg and Maggi (1999: 1147-1148). Goldberg and Maggi examined whether the inclusion of variables outside of the Grossman Helpman (1995) model thought to be important by other analysts could improve explanatory power. It turned out that only one permutation of additional explanatory variables did so, but even then not by much. Our results will also show that very few of the variables outside of the Grossman Helpman (1995) framework will substantially add to the explanatory power of the base regressions.

Similar approaches are taken to hypotheses concerning the effects of G20 membership and membership of FTAs.

Having described the potential significance of the research question posed here and highlighted key differentiating features of our empirical approach, we now briefly describe the contents of the rest of the paper. In the next section further specific comments on this paper's departure from the existing literature are presented. Section 3 turns to the theoretical benchmark employed in this paper against which the contemporary resort to protectionism is initially assessed. This section includes a description of the empirical strategy, the data employed, econometric specification and results, and an analysis of the residuals of the base specifications. Section 4 considers alternative explanations for the observed variation in contemporary protectionism. Section 5 includes caveats and some closing remarks.

2. Further remarks concerning the departure from the existing literature

The design of this paper has been markedly influenced by both the long-standing and more recent literature on protectionism. As to the former, our approach draws heavily upon models in which optimising politicians, firm owners, and owners of specific factors simultaneously determine how much to shelter domestic firms from import competition. Grossman and Helpman's 1995 model and subsequent developments have found considerable support in the data for a number of countries.[8] We recognise that there are other models of trade policy choice. Still, we chose arguably the most prominent available theoretical approach against which to benchmark contemporary protectionism.[9]

Our choice of a theoretical benchmark that affords no role to membership in international trade institutions requires some justification given that 153 jurisdictions are members of the WTO and that many governments sign free trade agreements and the like. Moreover, for some time considerable progress has been made in understanding how WTO membership affects government incentives and trade policy choice (a leading example being Bagwell and Staiger 2002). Anyone one of the following three approaches, two of which emphasis crisis-related factors, might justify employing the Grossman Helpman (1995) model over an alternative where multilateral trade accords materially affect policy choice, at least initially.

[8] A non-exhaustive list being Goldberg and Maggi (1999), Gawande and Bandopadhyay (2000), Eicher and Osang (2002), Mitra, Thomakos, and Ulubsolglu (2002), McCalman (2004), and Gawande and Li (2009). These papers take as their starting point the same industry-level prediction for the level of protectionism as we do. Others, such as Branstetter and Feenstra (2002), evaluate different predictions of models derived from the class now associated with what might be termed the Grossman Helpman approach.

[9] It is, of course, an interesting question whether an alternative benchmark would better account for the variation associated with contemporary protectionism.

Noting the fact that the degree to which WTO rules constrain policymaker's choice varies considerably across state measure, the current set of binding WTO rules are likely to channel contemporary pressures for protectionism into policy instruments where multilateral trade rules are at present weak or non-existent. Elsewhere, using data on the types of contemporary protectionism, Evenett (2010) has argued that the WTO rules are more likely to have affected the composition of crisis-era protectionism than the quantum of discrimination against foreign commercial interests. Such arguments mitigate in favour of keeping the 1995 version of the Grossman Helpman model and against focusing on a narrow set of policy instruments.

A second reaction recalls the realist position in international relations (of which Mearsheimer (1995) is a clear statement as this relates to the role of international organisations.) One of that school's central tents is that, when governments face difficult circumstances as they do during sharp national economic downturns, then the incentive to deviate from international accords increases and non-cooperation between states is the more likely outcome. When states simultaneously face such incentives to deviate--as they did during the recent global economic downturn--then international accords, including so-called binding rules, are more honoured in the breech. Governments may not publicise their deviations and may indeed seek to undermine or discredit attempts to monitor their behaviour during such dire straits. The abandonment of the strict European Union regime on subsidies during the recent global economic downturn, forced on the European Commission by the leading Member States, is a case in point (Jenny and Heimler 2010). On this view during sharp global economic downturns, then, models of governments constrained by international accords should be set aside in favour of models where governments are not so constrained, as in the Grossman Helpman (1995).

A third reaction takes a hybrid, two stage approach. Here the starting point remains examining the predictions of model with a government unconstrained by international accords. However, the objective of a second stage of analysis is to check whether deviations from the predictions of the model (here the Grossman Helpman 1995 model) are consistently correlated with some other candidate explanation (attributes of WTO membership etc.) For example, did WTO members that had previously agreed to bind a greater share of their tariffs on non-agricultural products at zero engage in less crisis-era protectionism? Moreover, was resort to protectionism lower in WTO members that were subject to the spotlight cast on them by the Trade Policy Review Mechanism during 2009 and 2010, highlighting the possible contribution of transparency? The pros and cons of such two stage approaches will be explored in section 4 of this paper.

Turning now to the literature on trade policy choice during the Great Recession, it is important to note that analysts have emphasised factors other than WTO membership have influenced trade policy choice. Baldwin (2010) shows how the international relocation of

stages of production alters subsequent incentives to raise trade barriers. During recent years the point has been made more informally: firms engaged in international supply chains or what has been termed "Factory Asia" are less likely to support crisis-related increases in trade barriers. Changes in corporate organisation, then, must be taken account of.

While Eichengreen and Irwin (2009) examined the impact of the exchange rate regime on the resort to protectionism in the Great Depression of the 1930s, their paper has contemporary relevance for it raises the question as to whether macroeconomic policy options are a substitute for protectionism. At present countries not only differ in their exchange rate regimes, but also in their sovereign debt ratings and pre-crisis government debt and fiscal deficit levels. Moreover, labour market flexibility, while not emphasised by Eichengreen and Irwin, may well attenuate pressures for protectionism.

Finally, while the academic literature on the impact of the following initiatives is thin, it is worth noting that the G20 group of countries, along with certain regional groupings, have taken a number of trade policy initiatives during the Great Recession. Most of these initiatives involved making joint public statements not to engage in protectionism, although subsequent discussions has revealed little agreement as to the meaning of these statements.[10] Even though none of these initiatives were binding, some have implied that they have had an effect (see, for example, Wolfe 2010, page 11).

3. A theoretical benchmark for crisis-era protectionism

3.1. Motivation and theoretical prediction for aggregate trade policy stance

Many empirical assessments of the cross-sectional predictions of the Grossman Helpman (1995) model conclude that it is not at odds with important features of the data (Feenstra 2004). In which case one might to what extent recent crisis-era protectionism represents a departure from "business as usual." Indeed, if the Grossman Helpman model did an adequate job of accounting for the variation in crisis-era protectionism then appeals to the bite of supply chains, G20 commitments, etc, might be superfluous.

Proposition 2 of Grossman Helpman (1995) provides a clean prediction of the cross section variation across industry i in the tariff rate t that is the endogenous outcome of a political equilibrium in which a self-interested policymaker presides over a contest of financial contributions from lobbyists for influence. As demonstrated in the theoretical annex to this

[10] Does a statement by a government not to engage in protectionism during the recent crisis mean that the government in question will not implement a single discriminatory state measure? Or does it mean that the government will not implement protectionism at a faster rate than before the crisis? New readers to this topic may well be surprised just how much slack some analysts have been prepared to cut governments when interpreting these statements. While much media reporting focuses on the question as to whether the G20 has kept its promises on protectionism, fortunately this paper is concerned with other matters.

paper, with the addition of one more assumption, the import-weighted average tariff rate t_j^{AV} for a country j can be derived and is equal to

$$(1) \qquad t_j^{AV} = \left(\frac{X_j}{M_j e_j} \right) \sum_i \left(\frac{\Phi_i \varphi_i}{\kappa_i} \right)$$

where: X_j is the total exports of nation j; M_j is the total imports of nation j; e_j is the average price elasticity of demand of imports in nation j; Φ_i is a function of the policymaker's preferences, the proportion of sectors that are members of lobbies, and whether sector i is represented by a lobby or not; $\varphi_i = \left(\frac{x_i}{X_j} \right)$, the share of nation j's exports accounted for by sector i; and $\kappa_i = \left(\frac{e_i}{e_j} \right)$, the ratio of the import price elasticity of demand in sector i compared to that the national average. Alternatively, write t_j^{AV} as

$$(2) \qquad t_j^{AV} = \left(\frac{X_j}{M_j} \right) \left(\frac{1}{e_j} \right) Z_j ,$$

the product of three terms, namely, a variable related to the magnitude of the national trade surplus, a variable determining the conditions of competition in the economy, and a term Z_j capturing sector-specific lobbying, size, policymaker's preferences, and supply side-factors. Equation (2) is a theoretically-derived predictor of average trade policy stance. Average tariffs will be lower in countries with larger trade deficits, where consumers' demand is more sensitive to prices, and where fewer sectors are organised for lobbying purposes.

3.2. Data employed

The first practical difficulty in evaluating prediction (2) arises because, as has been long known, governments do not confine themselves to tariffs when protecting domestic industries. Unfortunately, with the possible exception of Australia where at least one government agency regularly updates estimates of the effective rates of protection received by sectors, precious little current data exists on the types and size of trade barriers implemented by governments. Moreover, those sectoral estimates are rarely aggregated to give a measure of national trade policy stance.

For these reasons alternative, perhaps less satisfactory from an conceptual point of view, approaches to measuring aggregate trade policy stance have been employed in empirical

work. The approach taken here is based upon a new dataset on public policies implemented during the Great Recession that discriminate against foreign commercial interests. The independent Global Trade Alert (GTA) initiative, organised by the Centre for Economic Policy Research (CEPR), has been collecting data on state measures implemented since November 2008 that could alter (negatively or positively) the relative treatment of foreign commercial interests vis-à-vis domestic counterparts.[11] These commercial interests include not just importers and exporters, but also migrant workers, foreign investors, and owners of intellectual property. Although the beginning of the financial crisis is generally regarded as taking place in the third quarter of 2007, the GTA database records entries from November 2008, when government leaders committed themselves to eschew protectionism at the first crisis-related G20 summit. Data through the end of October 2010 were used in this study.[12]

The GTA employs a team of independent trade policy experts around the world to identify, investigate, report, and monitor state measures. Government reports, research papers and analyses, reports of international institutions, newspaper reports, and internet postings often provide the initial stimulus to investigate a measure. Where possible each report in the GTA database on a state measure provides an official source whereby users can, with the appropriate language skills, verify and ascertain more information about a measure. Having said that, despite substantial effort on the part of the GTA team, there can be no guarantees that every state measures is reported (in fact, evidence of reporting lags can be found in the later reports of the GTA.) To account for possible reporter-induced variation our regressions will include reporter-specific fixed effects whose values, for reasons of space, are suppressed here.

Each entry into the GTA database concerns (at the very least) the announcement of a state measure, which could be as narrow as a presidential decree relating to a tariff change on a single product or as wide ranging as a state budget with many government interventions. As each announced state measure can include multiple interventions, simple counts of the numbers of measures could be misleading for some purposes. For this reason, where possible, the GTA team identifies the four-digit product lines affects, the two-digit sector affected, and the number (and identity) of the trading partners affected by a state measure.[13]

[11] Recall the discussion of discrimination in footnote 3.

[12] As of today, 1413 individual reports on state measures have been posted on the GTA website.

[13] The latter investigations almost certainly understate the number of trading partners affected. For instance, in examining which countries are affected by a 10 percent increase in Ecuador's tariff on butter, the GTA team uses the UN COMTRADE database at the 4-digit level to identify which countries actually exported butter to Ecuador before the crisis began (in 2005 or 2006, wherever the latest data is available) above a *de minimus* level (typically one million US dollars). Therefore, potential exporters of butter to Ecuador that planned on exporting to Ecuador but were dissuaded from doing so would not be identified as affected. Similar objective and replicable procedures were designed and applied for other types of state measures.

Moreover, each state measure is coded according to a traffic light system, which reflects the GTA team's assessment of the nature of the discrimination, if any, associated with a state measure. State measures that are implemented and almost certainly involve discrimination against foreign commercial interests are coded red. A state measure is coded amber if it is either implemented and likely to discriminate against foreign commercial interests or if it is not yet implemented but if implementation were to follow the state would almost certainly discriminate against foreign commercial interests. Other measures, including measures to liberalise trade, are coded green. The periodic reports of the GTA explains these definitions in greater detail, reports statistics on the number of measures so classified, see Evenett (2010b) for the latest report. The statistics page of the GTA website allows statistics to be extracted by implementing jurisdiction, affected jurisdiction, type of trade measure, sector, and implementation status.

Finally, we differentiate between the types of policy instrument that are associated with a state measure, bearing in mind that more than one policy instrument may be associated with a single state measure. For expositional purposes it will be helpful to refer to "murky protectionism" as those discriminatory state measures not typically associated with the more transparent forms of protection, namely, tariffs and trade defence (contingent protection) measures. Therefore, discriminatory "buy national" public procurement policies, export promotion, and bailouts[14] are forms of murky protectionism.

From the GTA database, then, nine proxies for aggregate trade policy stance were computed for each jurisdiction over the two year period starting November 2008. Some of the proxies are outright counts of different discriminatory state measures, others indicate the range of economic activity or trading partners affected by a jurisdiction's discriminatory state measures:

1. The number of red state measures implemented by a jurisdiction.
2. The number of red and amber state measures implemented by a jurisdiction.
3. The number of tariff lines affected by the red and amber state measures implemented by a jurisdiction.
4. The number of trading partners affected by the red and amber state measures implemented by a jurisdiction.

[14] While financial sector bailouts received a lot of attention during the recent financial crisis, the entries in the GTA database reveal a substantial number of discriminatory financial support measures in manufacturing, agriculture, and some non-financial service sectors. Discriminatory bailouts remain, as of the end of 2010, the most prevalent form of discriminatory policy instrument employed in the GTA database, exceeding the totals for tariff increases and trade defence measures (the latter two being the staple protectionist response to the "ordinary" recession.)

5. The number of economic sectors affected by the red and amber state measures implemented by a jurisdiction.

6. The number of red tariff and trade defence instruments implemented by a jurisdiction.

7. The number of red "murky" state measures.

8. The number of red state aids (bail out) measures implemented by a jurisdiction.[15]

9. The number of red export promotion measures, including export subsidies, implemented by a jurisdiction. [16]

The first five measures of trade policy stance provide different indications of the overall level or reach of a jurisdiction's protectionism in the Great Recession; the correlation coefficients between these five measures being remarkably high. The second set of measures of trade policy stance will allow us to examine whether the determinants of protectionism vary across classes of discriminatory policy instrument. Each of the nine indicators of aggregate policy stance was computed for 117 trading jurisdictions using data collected about state measures announced between November 2008 and October 2010.

Turning now to the independent variables in equation (2), data on the ratio of national exports to imports was collected from the World Bank's *World Development Indicators* online. Bearing in mind that changes in trade policy stance may be contemporaneously correlated with the ratio of $\left(\frac{X_j}{M_j}\right)$, data on the latter was collected for the years 2000-2005. The ratio of the average value of the numerator to the denominator was taken as the proxy for $\left(\frac{X_j}{M_j}\right)$ during the Great Recession.

Data to proxy e_j, the price elasticity of import demand, was taken from the *World Competitiveness Reports* of 2008 and 2009. In both reports business persons were asked to rate (with one being the lowest and seven being the highest) the intensity of competition in national markets. The average of the ratings for 2007 and 2008 was computed for each jurisdiction and used as our proxy for e_j.

[15] As noted in the preceding footnote, resort to bailouts were common during the recent global economic downturn, in particular in 2008 and 2009. For this reason it may be of interest to separate out these measures and examine their determinants.

[16] Resort to export promotion measures was frequent in late 2009 and 2010, just when world trade began to recover. Again it may be of interest to examine what factors determine this form of discrimination as it relates to exports as opposed to imports.

A variety of factors likely to affect the propensity to organise a sector into an active lobby were used to generate proxies for Z_j. By providing information a free press may alter the incentives to form a lobby to oppose or support the imposition of discriminatory state measures against foreign commercial interests. Random House's numerical rating on a one-hundred point scale of the degree of freedom to report information by the press was used here. Data from the 2008 survey was employed, with higher score indicating greater press freedom.

Democratic institutions could be associated with different costs of lobbying than in other countries. Many political science analyses of protectionism (a very good example being Henisz and Mansfield 2006) have included variables associated with the absence of autocracy. The Polity IV project assessment on a scale of -10 (strongly autocratic) to +10 (strongly democratic) was used here. However, in our case, ten points was added to each score so that the independent variable was always positive and interpretation more straightforward.

Data from the International Foundation of Electoral Systems was used to calculate the total number of national elections (legislative, parliamentary, and presidential) that were due in 2009 and 2010.[17] The weight given by policymakers to national welfare--as opposed to income from lobbies--may be different during elections and in the run up to elections. This effect may be independent of global economic downturns, but possibly exacerbated by such downturns.

Finally, in order to pick up possible changes in the weight policymakers give to overall societal welfare during an economic crisis, we also obtained the change between the first and third quarter 2008 forecasts generated by the International Monetary Fund of the expected change in GDP for the full calendar years 2009 and 2010. Substantial deterioration in these forecasts were expected to might be expected to make policymakers more likely to resort to protectionism to "save jobs" etc.

Readers will have noticed that, unless there is some plausible reason to believe that an independent variable is almost certainly not a function of trade policy then, whenever possible, each independent variable is calculated using information from months before November 2008, which is the start of the two year period used to calculate the proxies for aggregate trade policy stance.[18] Finally, even though the independent variables are calculated using information available before November 2008, at least one independent

[17] Assuming the date of an election is fixed in advance according to some law or statute then there can be no effect of aggregate trade policy stance on election timing. Some nations, however, may give the right to call an election to the governing party or coalition.

[18] Some overlap with the period used to compute the dependent variables was inevitable when an independent variable was calculated using data for 2008. Here the overlap relates only to the last two months of 2008.

variable is likely to have been affected by expectations concerning the depth of each national downturn during what was to become the Great Recession.

3.3. Econometric specification and results

Our base specification took the following linear form:

$$(3)\quad \ln\left(t_j^{AV}\right) = \tilde{C} + \ln\left(\frac{X_j}{M_j}\right)^p + e_j^p + \tilde{Z}_j^p + \varepsilon_j$$

where (the previously undefined variables are): $\tilde{C}$, a set of GTA reporter-specific fixed effects; $\ln\left(\frac{X_j}{M_j}\right)^p$, a proxy for $\ln\left(\frac{X_j}{M_j}\right)$; e_j^p, a proxy for the inverse of the average price elasticity of import demand; $\tilde{Z}_j^p$, a linear sum of the independent variables to proxy for the political organisation costs and policymakers' preferences, as described in the last sector; and ε_j, a well-behaved error term.

The nine measures of aggregate trade policy stance listed in the last subsection are each transformed and then regressed on the independent variables in (3) using weighted ordinary least squares (OLS). Why transformed? At first, when OLS on the untransformed values of each dependent variable was performed, the best fitted regression line often predicted negative values for between 10 to 25 of the 117 observations. Negative counts of protectionism and the economic activity affected by protectionism don't make much sense. So the data for each dependent variable was transformed using the same method[19], essentially to ensure that the predicted values could approach zero without becoming negative.

Concerns about the scale of measurement error in the dependent variable caused us to weight each observation. Given the public pledges made by G20 governments and the greater attention given by the press to larger trading nations, we conjecture that the variance of the measurement error is larger for jurisdictions with smaller GDPs, whose economic policies are less likely to be reported in the international business press or

[19] Each observation of the dependent variable was divided through by a number just in excess of the maximum value of that dependent variable, generates a transformed dependent variable that lies between zero and one. Denote this transformed dependent variable, TDV. Then, a second transformation was performed, transforming TDV into $\ln\left(\frac{TDV}{1-TDV}\right)$. This double transformation ensures that the predicted value of the original dependent variable, once recovered, are always non-negative.

otherwise spotted by the GTA team. We therefore weighted each observation by the square root of the GDP (in billions of dollars) of each jurisdiction.

Table 1 reports the econometric estimates for each of the nine measures of aggregate trade policy stance. Irrespective of the measure, the ratio of national exports to imports as well as deteriorating GDP forecasts for 2009 and 2010 are statistically significant determinants of protectionism during the Great Recession. Despite all of the attention given to democratic variables in the political science literature, rarely do they have any purchase on the data during the recent crisis, at least as far as we can find. Interestingly the intensity of domestic competition always has the right sign, but is only statistically significant in five of the nine cases.

In terms of variation explained, there are marked differences across the nine measures of aggregate trade policy stance. Only 12 percent of the more traditional, transparent protectionism is accounted for by the model, whereas 26 percent of murky protectionism is.[20] Thirty percent of the measures corresponding to resort to subsidies and to export promotion measures are accounted for by the model. One reaction to these findings is that the model does not account of the constraints on the use of tariffs in global and regional trade accords and that this accounts for the differential explanatory power, an observation we return to later.

Analysis of the regression residuals resulted in one surprising finding, namely, that the correlation coefficients between each dependent variable and the relevant regression residuals are positive and, in fact, very close to one.[21] Figure 1 plots the correlation between these two variables for the first dependent variable used (the count of the number of state measures classified red by each jurisdiction). The plots for the other eight dependent variables are similar and are available upon request. These plots imply that the prediction of the Grossman Helpman model estimated here systematically under-predicts the resort to protectionism during the Great Recession in the very jurisdictions that imposed the most protectionism. Moreover, the degree of under-prediction is larger in the jurisdictions undertaking the most protectionism. Is the model missing something? Are there other explanatory variables to need to be taken into account? Whatever those explanatory variables are, if they are to improve fit then they must explain why more protectionism was imposed during the Great Recession than our standard understanding of trade policy would suggest.

[20] The mean of the R^2 for the nine base specficiations is 0.206.

[21] This finding survived a number of robustness checks, principally to check whether the original parameter estimates and associated regression residuals were unduly influenced by one or a small number of observations.

Given this striking finding the rest of this paper is devoted to examining whether hypotheses relating to other factors that might affect the resort to protectionism during the Great Recession--that is, hypotheses from outside the Grossman Helpman (1995) model--are positively correlated with the first stage regression residuals recovered above. While the hypotheses that follow are often motivated by economic considerations (incentives), no pretence is made to estimate a reformulated economic model or to engage in structural estimation. Still, it will be useful to know, having removed the variation caused by a traditional model of the political economy of trade policy, how much of the hypothesised determinants of protectionism during the Great Recession can actually account for the remaining unexplained variation?

4. Accounting for the deviations from the standard model: A statistical approach

Fortunately, as noted earlier, there are a wealth of alternative hypotheses concerning the resort to protectionism in recent years. To the best of our knowledge none of the proponents of the alternative hypotheses has been bold enough to claim that their preferred explanation renders irrelevant the factors raised by standard political economy models of trade policy choice. Therefore, in our first cut at the data we examine the extent to which the residuals from the theoretical prediction derived from the Grossman Helpman (1995) model can be accounted for by the alternative hypotheses. (As noted earlier, this part of our approach is similar to one step in Goldberg and Maggi's original evaluation of Proposition 2 of the Grossman Helpman (1995) model.)

One feature of the following approach is to eschew, wherever possible, dummy variables and to base identification in our cross-sectional dataset on plausible interaction terms. As far as evaluating the effects of membership of international institutions is concerned this approach has two advantages. First, one goes beyond the "average effect" estimated using common dummy variables for membership. And, second, this approach might shed light on the different aspects of membership that affect policy choice the most. So instead of asking "Did WTO membership limit the resort to protectionism during the crisis?" one can ask "Which aspects of WTO membership mattered more?" WTO membership, like the membership of other international initiatives, is not treated as a black box.

One way in which our sample of 117 jurisdictions vary is in their membership of the WTO and, among WTO members, in the nature and extent of legal obligations taken on. Recognising that joining the multilateral trading system required taking on many more legal obligations after the WTO was created in 1995[22], we differentiate between long-standing

[22] Some of the pertinent evidence concerning the obligations taken on by jurisdictions joining the WTO that were not previously GATT members, see Evenett and Primo Braga (2005). GATT members were automatically

members of the WTO (more precisely, those that joined during the pre-1995 GATT era) and new WTO members (that is, those current WTO members that were not GATT members.) Given the latter's policy options are subject to more stringent legal rules than other nations at comparable levels of development, we are not prepared to assume that new and long-standing WTO members respond to greater demands for protectionism during sharp global economic downturns in the same manner.

To fix ideas it will be useful to specify a number of hypotheses concerning the potential effect of WTO membership on the resort to protectionism during the Great Recession.

H1. Countries undergoing the process of acceding to the WTO throughout the sample period (November 2008-October 2010) would be less inclined to resort to protectionism as this could delay the successful conclusion of their accession negotiations. Any adversely affected WTO member could slow down or block progress on such negotiations.

H2. The smaller the share of a jurisdiction's exports to all other WTO members the greater the resort to protectionism, the share of exports at risk from any WTO-sanctioned retaliation being smaller. Much is made of the uniqueness of the WTO's dispute settlement system, so it will be interesting to see if the vulnerability to retaliation had any deterrent effect.

H3. The greater is the share of non-agricultural products where tariffs are bound at the WTO then (i) the less resort to tariff protectionism and (ii) the less resort overall to protectionism. (An alternative hypothesis here is that the greater the products subject to tariff bindings the more likely a government is to resort to discrimination that is unconstrained or weakly constrained by WTO rules.)

H4. The greater the difference between the bound and applied tariff rates for non-agricultural goods the less the resort to protectionism or, at least, to non-tariff-related forms of protectionism. (Put another way, the less flexibility to raise tariffs legally at the WTO diverts protectionist pressures towards other policy instruments.)

H5. The greater the percentage of non-agricultural products whose tariff rates are bound at zero the greater the commitment to free trade and the less likely to resort to protectionism. (Alternatively, like the fourth hypothesis, the greater this percentage, the less tariffs can be resorted to, and the greater the resort to murkier forms of protectionism.)

H6. A jurisdiction knowing that it will be subject to the Trade Policy Review Mechanism (TPRM) during the years 2009 or 2010 would be less likely to resort to protectionism or resort to the more transparent forms of protectionism. This hypothesis speaks to the so-called transparency functions of the WTO.

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grandfathered into the WTO when it was created in 1995 and therefore did not have to negotiate their entry to the WTO.

H7. Another transparency-related hypothesis is that WTO members with free presses are more likely to have any corporate favouritism in the form of protectionism publicised at home because in complying with WTO-related reporting requirements certain information is made public. Governments, knowing that such reports are made public, might be discouraged somewhat from resorting to protectionism in the first place.

H8. Since Least Developed Countries (LDCs) are either subject to less stringent rules under some WTO agreements[23] than non-LDCs or are less likely to be brought before WTO dispute settlement, LDCs feel less constrained by multilateral trade rules and enforcement and so resort to protectionism more often.

This set of eight hypotheses speak to the retaliation, legally binding, and transparency features of WTO membership. All but one hypothesis[24] is stated in a way that suggest a continuous interaction term that might identify the causal mechanism at work. Data from the *WTO Tariff Tables* and from the WTO website (in particular as it relates to the WTO accession process) were used to locate appropriate interaction terms.[25] Next, taking the residuals of each of nine original specifications, the residuals are run using OLS on the fifteen independent variables listed in Table 2 and a constant.[26]

Which, if any, of the hypothesised WTO-related effects account for unexplained variation of the Grossman Helpman (1995) model? Remarkably few independent variables have statistically significant estimates reported for them in Table 2. Only one independent variable is statistically significant across a majority (five) of the specifications, that is, the one relating to the difference between bound and applied tariff rates for new WTO members. The greater is that difference the less the resort to protectionism during the Great Recession. It would appear that the greater the option to raise tariffs available to new WTO members the less likely protectionism was resorted to in any form. This finding may be of policy interest given the tendency over time to allow newer members of the WTO less and less room between their bound and applied tariff rates on non-agricultural products.

[23] For example, LDCs are not subject to the WTO rules on subsidies. In principle, then, had a LDC government the resources it could have engaged in financial bailouts of domestic firms during the crisis without risking a legal challenge under WTO rules.

[24] Hypothesis H1 refers to a class of jurisdictions that have applied to join the WTO but have not completed the associated negotiations. It is not obvious what a relevant interaction term with applicant status could be. One option to explore is whether the number of years since the first application was made is correlated with less resort to protectionism, the apparent logic being that those jurisdictions that began their accession negotiations long ago want to wrap them up quickly and so do not want to jeopardise that outcome by engaging in unusual levels of protectionism during the Great Recession.

[25] In the case of hypothesis H7 the free press measure described in an earlier section was employed again.

[26] There are 15 independent variables because a separate parameter is estimated for the new and long-standing WTO members for hypotheses H2-H8 and a single parameter is estimated for WTO applicant status (Hypothesis H1).

The second interesting finding is that long-standing WTO members appear to resort less to murky protectionism when they were subject to a TPRM in 2009 or 2010. Although there appears to be some flexibility in the timing of such Reviews, the cycle over which nations are evaluated is well established (suggesting that endogenity issues may not be that important.) This finding suggests a positive crisis-related contribution of one transparency-related function of the WTO. Having said this, the other transparency-related aspect of WTO membership evaluated here, namely, notification, does not appear to have resulted in statistically significant reductions in the resort to protectionism, even if the estimated coefficients had the right sign for long-standing WTO members.

The small values of the adjusted R^2 in the second stage regressions reported Table 2 imply little purchase from the WTO-related hypotheses. It is important not to interpret this result too harshly. After all, we may have identified the right hypotheses but data quality problems plague the results. Alternatively, we may have missed relevant hypotheses (even if we have considered more hypotheses than any competing study we know of.) Finally, one might argue that the Grossman Helpman-related independent variables are correlated with those WTO-related regressors in the second stage regression and that the apparent poor performance of the latter is due to the attribution of the latter to the former in the first stage regression. We address this concern, in fact, over-compensate for it, below.

An alternative approach is to purge the first stage, Grossman Helpman (1995)-inspired independent variables of the variation associated with the second stage independent regressors. Such purges have the effect of making the purged first stage regressors orthogonal to the second stage regressors. Then, with these purged first stage regressors re-estimate the base specifications, this time including the previously second stage regressors in the first stage. Now if a WTO-related regressor is statistically insignificant, then one might be particularly doubtful of its capacity to account for protectionism during the Great Recession.

We implemented these steps and report for the WTO-related independent variables the estimated coefficients, associated standard errors, and measures of fit in Table 3. Not surprisingly, the number of statistically significant coefficients is larger in Table 3 compared to Table 2. Still, there was little support for hypotheses H1 (ongoing WTO accession moderating resort to protectionism), H2 (threat of retaliation from WTO members discouraging resort to protectionism), and H3 (more tariff lines bound affecting the resort to protectionism.) The finding that new WTO members resorted to protectionism less the greater the difference between the bound and applied rates cannot be rejected by the data. Evidence of "too tight" tariff bindings diverting protectionism can be found for long-standing WTO members: during the Great Recession the larger the percentage on non-agricultural products with tariffs bound at zero the greater the resort to murky protectionism (see, in particular, the results reported in the last three columns of Table 3).

One transparency-promoting feature of WTO membership cannot be rejected by the data. Strong support was found for the impact of the TPRMs on WTO members that joined during the GATT era. In all but one regression reported in Table 3, these Reviews were found to depress by a statistically significant amount the resort to protectionism during the Great Recession. For new WTO members, TRPMs reduced the resort to protectionism but not by amounts associated with standard levels of statistical significance.

Another noteworthy feature of the results reported in Table 3 is that the dependent variables associated with murky protectionism (the last three columns of this table) saw between 39.3% to 47.3% of the variation accounted for. However, when account is taken of the amount of variation explained by the prediction of the Grossman Helpman model, for the resort to murky protectionism approximately 15 percentage points in the reported R^2 can be accounted for WTO-related regressors.[27] Moreover, those regressors contribute more to explaining the variation in the resort to murky protectionism than transparent forms of protectionism. Finally, as far as the number of trading partners, economic sectors, and tariff lines affected by crisis-era protectionism is concerned, the addition of the WTO-related regressors added between 14 and 20 percentage points to the reported R^2. There is still plenty of variation left to explain.

Three comments follow. First, of the eight features of WTO membership were considered here, three features have made a statistically significant contribution to the resort to protectionism during the Great Recession. One of those three features (the TPRM) appear to have reduced protectionism, the other two (associated with "tight" bindings on tariffs on non-agricultural goods) were associated with higher levels of protectionism in the Great Recession. The latter two features of WTO membership appear to have had the opposite of their intended effect during the Great Recessions. Second, the median increase in adjusted R^2 (explanatory power) from including the WTO-related independent variables is 5.5 percentage points. This implies that the WTO-related variables had, on average, a third of the explanatory power as the original Grossman Helpman independent variables.

Third, even if the WTO-related variables are included as first stage regressors for all nine dependent variables, the correlation coefficients between the resulting residuals and the dependent variables falls to no less than 0.845. This implies that the "under-prediction of protectionism" problem still remains.

In ongoing research we have considered four other sets of hypotheses associated with G20 membership, international supply chains and "Factory Asia," preferential trade agreements, and alternatives to trade policies. Of these four sets of hypotheses, the regressors associated with G20 membership add the most to explanatory power; a median increase of 31

[27] Of course, taking account of the number of additional regressors associated with the WTO-related hypotheses would be penalised on other measures of fit, see one of the comments in the following paragraph.

percentage points in adjusted R^2. With respect to the progress in reducing the "under-prediction of protectionism," the inclusion of regressors for G20 membership or international supply chains reduce the correlation coefficients between the regression residuals and the dependent variables the most. The inclusion of either set of residuals reduces these correlation coefficients around 0.73, suggesting that no one set of explanatory variables really eliminates this problem.[28] Further research will have to ascertain which, if any, combination of independent variables can eliminate correct the tendency of our standard model of trade policy choice to under-predict the amount of protectionist in those jurisdictions that most used protectionism during the Great Recession.

5. Caveats and closing remarks

The reaction of policymakers to the systemic global economic crisis of 2007-2010 affords a terrific opportunity to revisit our long standing presumptions about the determinants of state measures that seek to push the burden of adjustment on to foreign commercial interests. That the the scale of protectionism during the Great Recession has, to date, been less than the Great Depression, and the diversity of contemporary protectionism has been greater than in the 1930s, further adds to our motives to revisit the determinants of trade policy choice.

Using a rich dataset of state measures taken during the Great Recession, our first goal was to examine the extent to which a leading approach to trade policy determination could account for recent policy choices. The findings were mixed. Some of the key determinants were estimated to have the correct sign, if not always statistically significant coefficients. Most surprisingly of all, we found that the leading approach under-estimates the resort to protectionism in the countries that used protectionism the most. Something else is going on.

Our second goal was to consider a number of potential hypothesis as to what that something else could be. Particular attention was given to examining eight hypotheses concerning WTO membership. Of those eight hypotheses, three could not be rejected by the data. One of these three hypotheses is consistent with the view that the Trade Policy Review Mechanism of the WTO may have limited the resort to protectionism during the Great Recession. This provides one of the first pieces of quantitative evidence of the benefits of the transparency-promoting feature of the WTO, a feature that many analysts appear to downplay compared to the liberalisation function of the WTO and its predecessor, the GATT.

The other two hypotheses that have some purchase over the data suggest that "tight" tariff bindings on non-agricultural goods have been associated with higher levels of protectionism outright or higher levels of murkier forms of protectionism. While there appears to be little

[28] The results mentioned in this paragraph are available from the corresponding author upon request.

evidence that WTO members have violated their tariff bindings, this is of little comfort if protectionist pressures during a sharp global economic downturn are displaced rather than curtailed. This statistical finding is consistent with other empirical assessments that have argued that certain WTO rules have probably done more to alter the composition of protectionism during the Great Recession than to limit the quantum of protectionism (Evenett 2010a). Consequently, the logic and cost-benefit analysis of tariff bindings, a core WTO obligation, may need to be rethought if other studies confirm the findings presented here.

Next we compared the explanatory power of hypotheses associated with the WTO with those associated with G20 membership, membership of FTAs, availability of alternative macroeconomic policies, and changes in corporate organisation. The additional explanatory power associated with including the hypotheses associated with G20 membership was greatest. Even so, no one set of hypotheses seems to correct the "under-prediction" problem. In future work we plan on refining these alternative hypotheses to provide a fuller account of the strengths and weaknesses of various accounts of the protectionism witnessed during the Great Recession.

References

Baldwin (2010). Richard E. Baldwin. Unilateral tariff liberalization. National Bureau of Economic Research working paper number 16600. December.

Bagwell and Staiger (2002). Kyle Bagwell and Robert Staiger. *The Economics of the World Trading System.* MIT Press.

Branstetter and Feenstra (2002). Lee Branstetter and Robert Feenstra. Trade and foreign direct investment in China: A political economy approach. *Journal of International Economics* 58: 335-58.

Eicher and Osang (2002). Theo Eicher and Thomas Osang. Protection for sale: An empirical investigation: Comment. *American Economic Review*. 92: 1702-10.

Eichengreen and Irwin (2009). Barry Eichengreen and Douglas Irwin. The Slide to Protectionism in the Great Depression: Who Succumbed and Why? National Bureau of Economic Research working paper number 15142. July.

Evenett (2010a). Simon J. Evenett. The role of the WTO during systemic economic crises. Paper prepared initially for the first Thinking Ahead in International Trade Conference, Geneva, September 2009. Revised version July 2010.

Evenett (2010b). Simon J. Evenett. *Tensions Contained…For Now: The 8th GTA Report.* Available at: http://www.globaltradealert.org/tensions_contained_8th_gta_report?topad

Evenett and Primo Braga (2005). Simon J. Evenett and Carlos Primo Braga. WTO Accession: Lessons from Experience. *Trade Note Number 22*. World Bank.

Feenstra (2004). Robert C. Feenstra. *Advanced International Trade: Theory and Evidence*. Princeton University Press.

Gawande and Bandopadhyay (2000). Kishore Gawande and Usree Bandopadhyay. Is protection for sale? A test of the Grossman-Helpman theory of endogenous protection. *Review of Economics and Statistics* 89: 139-152.

Gawande and Li (2009). Kishore Gawande and Hui Li. Dealing with Weak Instruments: An Application to the Protection for Sale Model. *Political Analysis* 17: 236-260.

Goldberg and Maggi (1999). Pinelopi Goldberg and Giovanni Maggi. Protection for sale: An empirical investigation. *American Economic Review* 89: 1135-55.

Grossman and Helpman (1995). Gene Grossman and Elhanan Helpman. Protection for sale. *American Economic Review* 84: 833-850.

Jenny and Heimler (2010). Frederic Jenny and Alberto Heimler. The Limitations of EC State Aids Control. November.

Henisz and Mansfield (2006). Witold J. Henisz and Edward D. Mansfield. Votes and Vetoes: The Political Determinants of Commercial Openness. *International Studies Quarterly* 50:1, 189-212.

McCalman (2004). Phillip McCalman. Protection for sale and trade liberalization: An empirical investigation. *Review of International Economics* 12: 81-94.

Mearsheimer (1995). John Mearsheimer. The False Promise of International Institutions. *International Security,* Vol. 19, No. 3, pp. 5-49.

Mitra, Thomakos, and Ulubasolglu (2002). Devashish Mitra, Dimitrios D. Thomakos, and Mehmet A. Ulubasoglu. Protection for sale in a developing country: democracy versus dictatorship. *Review of Economics and Statistics* 84: 497-508.

Rose (2004). Andrew Rose. Do we really know that the WTO increases trade? *American Economic Review*. March. 94: 98-114.

Wolfe (2010). Robert Wolfe. Did the protectionist dog bark? Transparency, accountability, and the WTO during the global crisis. Prepared for the annual meeting of ISA-Canada with the Canadian Political Science Association, Montreal, June 1, 2010.

Theoretical Annex.

Proposition 2 of Grossman Helpman (1995) states that, for a sector i, the optimal tariff selected by the optimising government is given by

$$\left(\frac{t_i}{1+t_i}\right)=\left(\frac{I_i-\alpha_L}{\frac{\beta}{1-\beta}+\alpha_L}\right)\left(\frac{\frac{x_i}{m_i}}{e_i}\right)=\Phi_i\left(\frac{\frac{x_i}{m_i}}{e_i}\right)$$

Assume t_i is small enough such that $\left(\frac{t_i}{1+t_i}\right)\approx t_i$, then

$$t_i m_i \approx \Phi_i\left(\frac{x_i}{e_i}\right)\Rightarrow\sum_i\left(\frac{t_i m_i}{M_j}\right)\approx\sum_i\frac{\Phi_i}{M_j}\left(\frac{x_i}{e_i}\right)=\sum_i\frac{\Phi_i}{M_j}\left(\frac{\varphi_i X_j}{\kappa_i e_j}\right)=\sum_i\left(\frac{\Phi_i\varphi_i}{\kappa_i}\right)\left(\frac{X_j}{M_j e_j}\right),$$ which can be rewritten as:

$$t_j^{AV}=\left(\frac{X_j}{M_j e_j}\right)\sum_i\left(\frac{\Phi_i\varphi_i}{\kappa_i}\right)+\ldots$$

Table 1: Regression estimates for the prediction for aggregate trade policy standard derived from the Grossman Helpman (1995) model.

	DEPENDENT VARIABLES								
INDEPENDENT VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intensity of local competition, e	-0.0118*	-0.0127	-0.0217	-0.0362**	-0.0281**	-0.00614*	-0.00543	-0.00410*	-0.00155
Ratio of national exports to imports, 2000-5	0.0563***	0.0748**	0.0619**	0.112***	0.0943***	0.0192***	0.0317***	0.0114**	0.00719***
Freedom of press score	0.000598	0.00101	0.00210**	0.000689	0.00198**	0.000252	0.000186	-5.26e-05	-6.90e-05
Total # elections 2009 and 2010	-0.00522	-0.00657	-0.00777	-0.0112	-0.00719	-0.00102	-0.00330	-0.00113	-0.00160
Democracy index	0.00267	0.00407	0.00246	0.00278	0.00411*	0.000912	0.00126	0.000536	0.000242
Change of forecasted real GDP growth in 2009	-0.0427***	-0.0438***	-0.0499**	-0.116***	-0.0588***	-0.0117***	-0.0298***	-0.0190***	-0.00979***
Change of forecasted real GDP growth in 2010	-0.0454***	-0.0457***	-0.0552*	-0.118***	-0.0695***	-0.0186***	-0.0257***	-0.0134**	-0.00904***
Observations	117	117	117	117	117	117	117	117	117
R-squared	0.174	0.119	0.122	0.262	0.187	0.120	0.260	0.309	0.301
Adj. R-squared	0.121	0.0627	0.0653	0.215	0.134	0.0632	0.212	0.265	0.256
Degrees of freedom	109	109	109	109	109	109	109	109	109
Nr. neg. predictions if dep. variable not transformed	11	12	26	11	11	13	12	18	13
Correlation betw. y's and errors	0.975	0.986	0.961	0.930	0.943	0.981	0.955	0.944	0.920

Body text of table reports parameter estimate and stars (*) to indicate extent of statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Plot of regression residuals versus the dependent variable, where the latter equals the number of red state measures implemented.

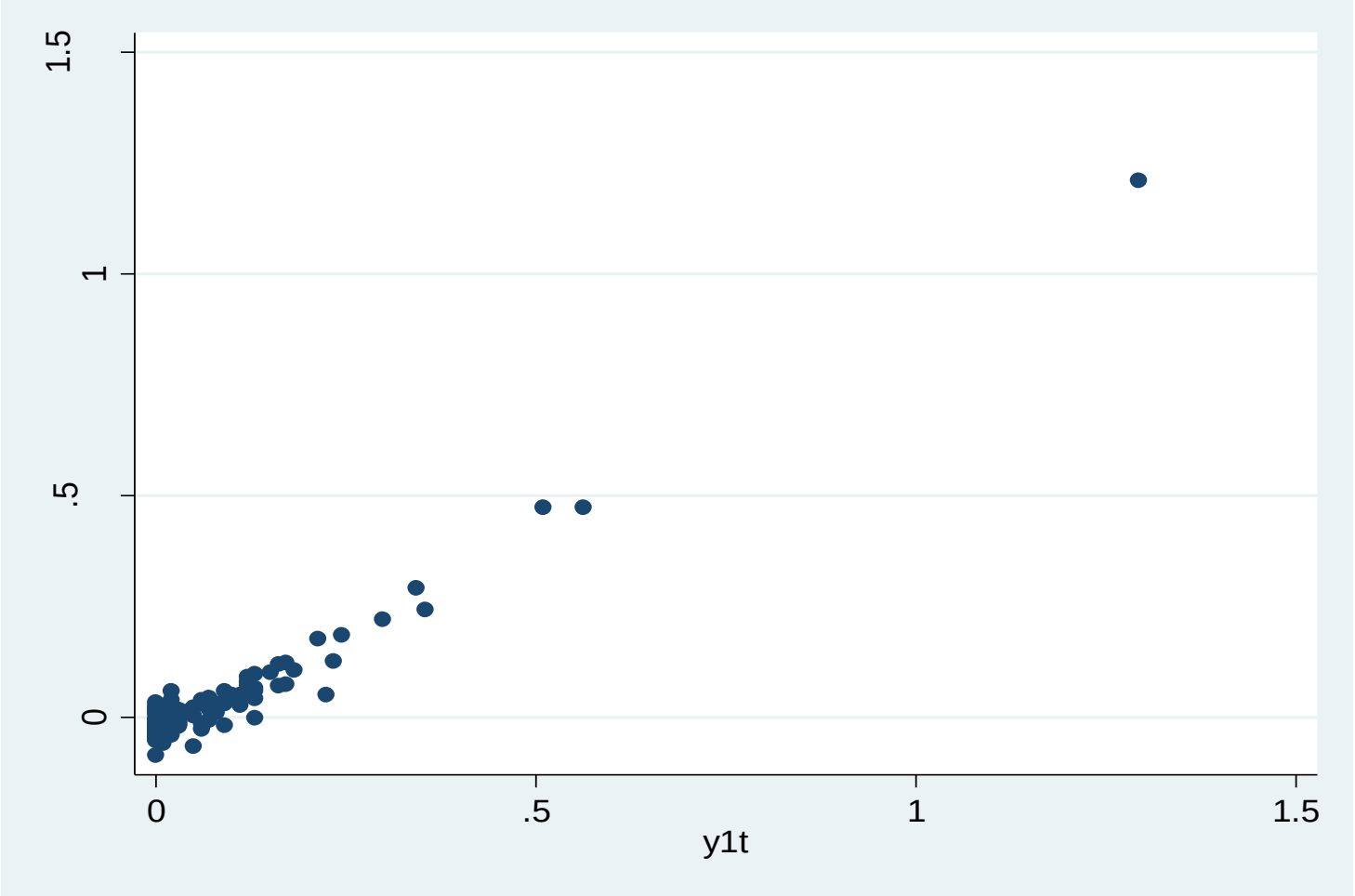


Table 2: Regression estimates when the residuals from the first stage regressions are used as the dependent variable.

HYPOTH-	WTO		DEPENDENT VARIABLES								
ESIS	MEMBER	INDEPENDENT VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
H1		WTO Accession process	-0.0729	-0.0527	0.406	-0.281	0.272	-0.117	0.0218	0.00813	-0.0184
H2	Long	Share of exports to other WTO members	-0.142	-0.188	0.375	-0.303	0.192	-0.116	-0.0150	-0.0113	-0.0206
H2	New	Share of exports to other WTO members	0.0310	0.0397	0.418	0.328*	0.226*	0.0259	0.00542	-0.00538	0.00114
H3	Long	Share of non-agri products under tariff bindings	0.000174	0.000253	-7.98e-05	0.000224	-0.000157	0.000125	4.34e-05	1.92e-05	4.63e-05
H3	New	Share of non-agri products under tariff bindings	-0.00250	-0.00301	-0.000814	-0.00627	-0.000908	-0.00171*	-0.000666	-0.000280	-0.000272
H4	Long	Difference between bound and applied average tariff rates	-0.000141	-0.000138	0.000396	-0.000368	0.000520	-0.000130	-1.32e-05	-0.000128	-4.37e-05
H4	New	Difference between bound and applied average tariff rates	-0.00499*	-0.00702*	-0.0226**	-0.0286***	-0.0153***	-0.00368**	-0.00114	9.93e-05	-0.000650
H5	Long	Share of duty-free bound in non-agricultural goods	-0.000399	-0.00114	-0.000572	0.00129	1.76e-05	-0.000810	0.000515	0.000595**	-9.66e-05
H5	New	Share of duty-free bound in non-agricultural goods	-0.000877	-0.00175	-0.00192	-0.00515	-0.00190	-0.00103	0.000231	0.000359	9.77e-05
H6	Long	TPRM in 2009 or 2010	-0.0372*	-0.0327	-0.0158	-0.0342	-0.0180	-0.00581	-0.0302***	-0.0184***	-0.0128***
H6	New	TPRM in 2009 or 2010	0.00431	0.0224	-0.127	-0.0532	-0.0416	0.00910	-0.00640	0.00210	-0.00126
H7	Long	Interaction with free press measure	-0.00111*	-0.00147*	-0.000401	-0.00127	-0.00100	-0.000617*	-0.000378	-0.000124	-0.000141
H7	New	Interaction with free press measure	0.000785*	0.000666	0.00487	0.00462**	0.00218	0.000570*	0.000282	-2.35e-05	-7.52e-05
H8	Long	LDC status	-0.00105	-0.00539	-0.0374	-0.0327	-0.0460	-0.00766	0.00454	0.00809	0.00251
H8	New	LDC status	-0.0319	-0.0391	-0.172	-0.209	-0.104	-0.0230	-0.00865	0.00676	0.000215
		Observations	117	117	117	117	117	117	117	117	117
		R-squared	0.105	0.093	0.241	0.198	0.195	0.086	0.151	0.170	0.163

Adj. R-squared	-0.0280	-0.0413	0.128	0.0791	0.0754	-0.0498	0.0252	0.0468	0.0389
Degrees of freedom	101	101	101	101	101	101	101	101	101

Body text of table reports parameter estimate and stars (*) to indicate extent of statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Table 3: Regression estimates for the first stage regressions in which the Grossman Helpman regressions have been purged of the variation associated with the WTO-related independent variables.

HYPOTH-	WTO		DEPENDENT VARIABLES								
ESIS	MEMBER	WTO-RELATED INDEPNDENT VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
H1		WTO Accession process	0.113	0.142	0.420*	0.182	0.414*	0.00824	0.0838	0.0371	0.00631
H2	Long	Share of exports to other WTO members	0.112	0.124	0.355	0.186	0.334	0.0136	0.0843	0.0434	0.00980
H2	New	Share of exports to other WTO members	0.0331	0.0309	0.450	0.332*	0.222*	0.0204*	0.0125	-0.00505	-8.05e-05
H3	Long	Share of non-agri products under tariff bindings	7.07e-05	9.22e-05	6.31e-05	7.68e-05	7.20e-06	4.83e-05	1.84e-05	1.20e-05	1.14e-05
H3	New	Share of non-agri products under tariff bindings	0.000742	0.000836	-0.00172	-0.000636	0.000645	-0.000210	0.000854	0.000635*	0.000267
H4	Long	Difference between bound and applied average tariff rates	-8.45e-05	-0.000102	-0.000142	-0.000443	3.09e-05	-0.000104	2.99e-05	-3.67e-05	-1.03e-05
H4	New	Difference between bound and applied average tariff rates	-0.00363**	-0.00408**	-0.0166*	-0.0204***	-0.0106**	-0.00164**	-0.00193**	-0.000569	-0.000805*
H5	Long	Share of duty-free bound in non-agricultural goods	0.00151**	0.00132	-0.000148	0.00459**	0.00103	0.000148	0.00141***	0.00109***	0.000505***
H5	New	Share of duty-free bound in non-agricultural goods	-0.000384	-0.000557	-0.00203	-0.00302	-0.00149	-0.000445	6.06e-05	0.000247	8.93e-05
H6	Long	TPRM in 2009 or 2010	-0.0344***	-0.0353**	-0.0288*	-0.0736***	-0.0487***	-0.00888	-0.0245***	-0.0122***	-0.00866***
H6	New	TPRM in 2009 or 2010	-0.0230	-0.0195	-0.137	-0.129*	-0.0819*	-0.0109**	-0.0122	-0.00265	-0.00318
H7	Long	Interaction with free press measure	-0.000251	-0.000259	0.000415	-0.000276	5.12e-05	-0.000113	-0.000127	-9.88e-05	-7.96e-05
H7	New	Interaction with free press measure	0.000194	0.000222	0.00650*	0.00281	0.00299	0.000487**	-0.000317	-0.000475***	-0.000351**
H8	Long	LDC status	-0.0154	-0.0234	-0.0374	-0.0408	-0.0482*	-0.00775	-0.00641	-0.000111	0.000278
H8	New	LDC status	-0.0387	-0.0413	-0.219	-0.216**	-0.136*	-0.0234**	-0.0149	0.00148	-0.000679
		Observations	117	117	117	117	117	117	117	117	117

R-squared	0.252	0.180	0.328	0.408	0.349	0.163	0.393	0.452	0.473
Adj. R-squared	0.0767	-0.0117	0.171	0.270	0.196	-0.0333	0.251	0.324	0.349
Degrees of freedom	94	94	94	94	94	94	94	94	94
Correlation betw. y's and residuals	0.958	0.976	0.856	0.876	0.885	0.974	0.914	0.886	0.845

Body text of table reports parameter estimate and stars (*) to indicate extent of statistical significance: *** p<0.01, ** p<0.05, * p<0.1