The World Economy

The World Economy (2014)
doi: 10.1111/twec.12141

Protection and Performance

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1. INTRODUCTION

IN a classic paper, Lerner (1936) demonstrated that under perfect competition, full employment, balanced trade and in the absence of transport costs, the imposition of import tariffs has the same effect as an export tax. The intuition behind Lerner's proposition is that higher protection shifts home demand towards home goods, which makes less supply available for sale to export partners. The general equilibrium correspondence (or even an exact symmetric correspondence under appropriate conditions) between import policy (i.e. tariffs) and export policy now stands as a classic result of general equilibrium trade theory.[1] Despite this correspondence, the recent literature on policy and patterns of trade focuses on the policy of importers. This is especially true in the now voluminous literature on the gravity equation. In this literature, bilateral import protection affects trade directly, while the general level of protection of individual countries also plays a role. Indeed, general levels of import protection in third countries can also deflect trade to alternative markets. The critical point is the emphasis on policy in importing markets.

In contrast, in this paper, we emphasise import protection by exporters. To do this, we bridge both the concepts of multilateral resistance from recent gravity literature to the macroconcept of Lerner symmetry. Although largely ignored by the recent literature, we show that the role of policy in exporting markets in explaining general levels of trade should be comparable to policy in importing markets. In particular, we extend the classical, analytical mapping of aggregate, macroeconomic trade volume effects that follow from Lerner-type mechanisms to more recent concepts from the empirical trade literature linked to bilateral gravity models of trade. This is particularly relevant for the recent empirical literature on trade, policy, and trade cost estimation as specified using this class of models. Working with a panel of global and bilateral trade data spanning over 15 years, we find evidence at both the aggregate level, and also at the bilateral level, that the import policies implemented by exporters are a significant macroeconomic factor in explaining overall – and hence also bilateral – export performance. These results reinforce the growing body of recent evidence on the importance of economic environmental (policy and infrastructure) conditions in developing countries in explaining their relative export performance.

Miriam Manchin would like to acknowledge the financial support received from the European Commission under the Marie Curie Intra-European Fellowship Programme. Particular thanks are due to Jeff Bergstrand, Peter Neary, Doug Nelson, and Alan Woodland for constructive comments and encouragement, as well as Will Martin, Peter Egger, Eddy Bekkers, and participants in assorted sessions at the Econometric Society meetings, the European Trade Study Group, UCL, the Tinbergen Institute, and CEPR. We would also like to thank Paulo Guimaraes for helpful suggestions on methodological issues.

[1] At the macroeconomic level, this relationship has been well explored in the literature with alternative assumption sets. McKinnon (1966) extended the Lerner symmetry theorem to the three-commodity case with two import and one export good. The theorem was further extended to non-tradables (McDougall, 1970; Kaempfer and Tower, 1982; Canto et al., 1992), to a three-sector model with non-tradables (Chen and Devereux, 1994; Milner, 1995). Other extensions have involved imperfect competition (Ray, 1975), bilateral tariffs (Gardner and Kimbrough, 1990), quantitative restrictions (Lopez and Panagariya, 1995) and the role of the trade balance (Blanchard, 2009). At the macroeconomic level, Lerner effects relate to the links between the real and financial sides of the economy.

We have organised the paper as follows. In Section 2, we outline a basic analytical representation of the gravity model that includes both aggregate and bilateral Lerner effects. Section 3 provides our empirical analysis, highlighting the effects of import policy on export performance both at aggregate and bilateral level. We conclude in Section 4.

2. IMPORT POLICY AND EXPORTS

We start with a relatively general representation of the aggregate links between import and export values, linking import tariffs in exporting markets analytically to exports in the context of modern gravity model specifications. This is closely linked to the concept of multilateral resistance as developed by Anderson and van Wincoop (2003), where here we include the impact of import policy on exports. The Anderson et al. (2003) representation of the gravity model, although constant elasticity of substitution (CES) based, actually follows from a wide range of standard models (Novy, 2013b). The derivations here provide us with motivation for a set of estimating equations, both in aggregate and for bilateral gravity modelling of trade, augmented to incorporate not only standard gravity terms like trade policy in the destination market, but also aggregate trade protection in the source or export markets as a source of 'multilateral export resistance' through general equilibrium Lerner effects. We start with CES-based aggregate demand in equation (1), including domestic absorption.

$$Q_d = \left(\sum_{s=1}^{r} \alpha_s g_{s,d}^{\rho} \right)^{1/\rho}. \tag{1}$$

In equation (1), g denotes both domestic absorption and imports, and r includes all countries (and so indexes domestic purchases as well as imports). We adopt the indexing convention that $s = 1 \ldots r$ denotes source and $d = 1 \ldots r$ denotes destination. We normalise f.o.b. prices to unity. We can then define GDP as the quantity of the national good g_s summed across destination markets. This implies the supply constraint in equation (2).

$$G_s = \sum_{d=1}^{r} g_{s,d}. \tag{2}$$

We now introduce a natural bilateral distance cost $\gamma_{s,j}$ and a policy cost $\tau_{s,j}$. Both operate as iceberg costs. From the properties of constrained optimisation of consumption given equation (1), treating GDP as the income constraint, we then have

$$g_{s,d} = G_d P_d^{\sigma-1} \alpha_s^{\sigma} \left(\tau_{s,d} \gamma_{s,d} \right)^{-\sigma}, \tag{3}$$

where in equation (3) the term P_d denotes the CES price index for destination country d associated with equation (1). Combining equations (2) and (3) and re-arranging, we arrive at the following:

$$g_{s,d} = G_s \left\{ 1 - \sum_{j \neq d,s} G_s^{-1} G_j P_j^{\sigma-1} \alpha_j^{\sigma} \left(\tau_{s,j} \gamma_{s,j} \right)^{-\sigma} - \alpha_s^{\sigma} \tilde{\tau}_s^{\sigma-1} \left[\sum_{h=1}^{r} \alpha_h^{\sigma} \left(\frac{\tau_{h,s}}{\tilde{\tau}_s} \gamma_{h,s} \right)^{1-\sigma} \right]^{-1} \right\}. \tag{4}$$

Here, we have also made a substitution of the CES price index for country s associated with equation (1). In equation (4), the term $\tilde{\tau}_s$ denotes average trade costs imposed by exporter s. We can see that viewed from the supply side, bilateral exports hinge on total available supply, third-country demand, but also the level of import protection applied by the exporter s. This is because, to close Lerner's classic argument, higher protection shifts home demand towards home goods, which makes less supply available for sale to export partners. This is reflected, in equation (4), in the last term of the equation.[2]

A standard estimating equation follows from equation (3), where taking logs we have a simple log-liner equation. Similarly, we can also modify equation (4). First define V such that we can rewrite (4) as follows:

$$g_{s,d} = G_s V_{s,d}. \tag{5}$$

Next, we define proportional changes as $\hat{x} = dx/x \approx d \ln x$. Differentiating equation (5) and using our definition of $\hat{x}$, we can rewrite (5) and hence (4) as follows:

$$d \ln (g_{s,d}) \approx d \ln (G_s) + \sum \varepsilon_{v,k} d \ln (k). \tag{6}$$

Basically, log deviations in exports depend on log deviations in supplier GDP, and in the arguments that go into V, which is the second term in brackets in equation (4). This also depends on the elasticities of V with respect to the arguments k that go into V. These elasticities are $\varepsilon_{v,k}$.

We can also start from equations (2) and (3) to derive a similar condition for aggregate exports. We note first that domestic absorption is also defined by equation (3).

$$g_{s,s} = G_s P_s^{\sigma-1} \alpha_s^{\sigma}. \tag{7}$$

Combining this with equation (2) and re-arranging, we arrive at aggregate exports z_s. Note that in equations (7) and (8) we have normalised home trade and distance costs to 1.

$$z_s = G_s \left(1 - P_s^{\sigma-1} \alpha_s^{\sigma}\right) = G_s H_s. \tag{8}$$

The term H_s represents the last right-hand expression in extended form of the equation. It depends on rates of protection, and on factors like distance from supplier countries. Applying derivations to equation (8) similar to those for equation (6), we arrive at the following.

$$d \ln (z_s) \approx d \ln (G_s) + \sum \varepsilon_{h,k} d \ln (k). \tag{9}$$

As in bilateral exports, from equation (9), the log deviation in aggregate exports depends on log deviations in supplier GDP, and in the arguments that go into H, such as average distance and the rate of protection. It also depends on the elasticities of V with respect to the arguments k that go into H.

3. EMPIRICS

We next turn to an empirical analysis of the impact of import policy on export performance both at aggregate level and bilateral trade level.[3]

[2] Technically in equation (4), we have also included the tariff applied to domestic absorption. This can be cleaned up by imposing a normalisation condition on $\gamma_{k,k}$.

[3] The recent empirical literature on the impact of tariffs on exports includes a mix of econometrics and computable general equilibrium (CGE) models. Tokarick (2006) uses a CGE model to quantify the extent to which import tariffs act as an export tax. OECD (2012) find empirical support for the Lerner symmetry using an aggregate export equation. Other papers have looked at the effects of import protection on particular export sectors in particular countries. This includes Schiff and Valdes (1992), and Manzur et al. (1995). More recently, in their empirical work on the role of the WTO in promoting trade, Subramanian and Wei (2007) invoke own-liberalisation in their econometric model of the evolution of bilateral trade. Our use of selection modelling is a break from the general approach followed in the literature.

a. Empirical Methodology

(i) Aggregate trade

In the sub section that follows, we start with versions of equation (9). Our estimating equation for total trade is defined below in equation (10):

$$\begin{aligned} \ln v^{x}{}_{it} =& \beta_0 + \beta_1 \ln (own\tau_{it}) + \beta_2 \ln (world\tau_{it}) + \beta_3 \ln (size_{it}) \\ &+ \beta_4\zeta_{it} + \beta_5 \ln (W\,distance_{it}) + F_i + F_t + \varepsilon_{it}. \end{aligned} \tag{10}$$

Motivated by natural trade costs in P in equation (9), we have included the GDP-weighted distance from the world *Wdistance*. To represent the size of the economy (the term G in equation 9), we use both population and GDP. In addition to the exporter's import tariff, *own* τ, we also include third-country policy (another aspect of the trade cost environment) as the trade-weighted average tariff faced in export markets, represented by the variable *world* τ. The term ζ measures the role of the current account balance.[4] Finally, we have also included exporter and time fixed effects in the regressions. We estimate equation (10) using OLS.

(ii) Bilateral trade

In specifying the underlying structure of equation (11) for the bilateral regressions, or identically the right-hand side variables that make up $v^{x}{}_{i,j}$, we rely on equation (6). There are many paths that lead to the now standard functional relationship we use here. The first to propose a gravity equation for trade flows as an empirical specification for trade without theory was Tinbergen (1962). Anderson (1979) was the first to provide microfoundations based on the Armington assumption. Among the more recent literature, Anderson and van Wincoop (2003) elaborate on Anderson (1979) adding a practical way to estimate the gravity equation structurally (Deardorff, 1988; Evenett and Keller, 2002; Arvis et al., 2013; Novy, 2013a, 2013b). A basic point of Anderson and van Wincoop (2003) is multilateral resistance. Not accounting for multilateral resistance terms in a gravity model can lead to biased parameter estimates. This can be addressed with country-level fixed effects, but one then loses scope for analysis of country-level factors. To get around this, a recent strategy involves Taylor approximations of the multilateral resistance terms to solve for the multilateral resistance terms (Baier and Bergstrand, 2009). This allows for estimation of the gravity equation, inclusive of country-level variables. In this paper, we follow Baier and Bergstrand (2009) extended to accommodate our Lerner variable and time variation in the data.

Following the gravity literature, we expect trade flows to be a function of importer and exporter income, as well as of determinants of bilateral trade costs, namely distance, tariffs, and whether countries speak the same language. Finally, pulling all this together yields the following estimating equation.

$$\begin{aligned} \ln v^{x}{}_{i,j,t} =& \alpha_0 + \alpha_1 \ln importer\,GDP_{j,t} + \alpha_2 \ln exporterGDP_{i,t} + \alpha_3 \ln distance_{i,j} \\ &+ \alpha_4 commonlanguage_{i,j} + \alpha_5 \ln importer\tau_{i,j,t} + \alpha_6 \ln exporter\tau_{i,t} + \alpha_7\zeta_{i,t} + u_{i,j,t}. \end{aligned} \tag{11}$$

Equation (11) assesses the determinants of the value of bilateral trade. $v^{x}{}_{i,j,t}$ is the value of country i exports to country j at time t. ln $importerGDP_{j,t}$ and ln $exporterGDP_{i,t}$ measure the market size of importers and exporters using GDP. Distance is well established in the gravity

[4] See Francois and Manchin (2013) for more discussion on this point.

equation literature (Disdier et al., 2003; Anderson and van Wincoop, 2003). The variable dummy *commonlanguage* captures if the traders of the two trading partners can speak the same language or generally share the same linguistic heritage. For bilateral import protection, we use applied tariffs, $\ln\ importer\tau_{i,j,t} = \ln\left(1+\tau_{i,j,t}\right)$, where $\tau_{i,j,t}$ indicates the tariff applied against exporter i by importer j in period t. The variable $\ln\ exporter\tau_{i,t}$ measures the exporter country's own average import tariff rate *vis-a-vis* the rest of the world. The term ζ, as in the aggregate regressions, measures the role of the current account balance from equation (10).

To include multilateral resistance terms, equation (11) is extended following Baier and Bergstrand (2009). Indexing importers by (j,k,h), and exporters by (i,m,z), equations (19) and (20) from Baier and Bergstrand (2009, p. 80) are reproduced as equations (12) and (13) below.

$$P_{it} = \sum_{m\notin i} \ln T_{imt}\frac{GDP_{mt}}{GDP_{wt}} - (0.5)\sum_h\sum_z \frac{GDP_{ht}}{GDP_{wt}}\frac{GDP_{zt}}{GDP_{wt}} \ln T_{hzt}. \tag{12}$$

$$P_{jt} = \sum_{j\notin j} \ln T_{kjt}\frac{GDP_{kt}}{GDP_{wt}} - (0.5)\sum_h\sum_z \frac{GDP_{ht}}{GDP_{wt}}\frac{GDP_{zt}}{GDP_{wt}} \ln T_{hzt}. \tag{13}$$

Here, we have modified the basic Baier and Bergstrand specification to include time indexing. In the case of bilateral tariffs $\ln T_{ijt}$, we can specify multilateral resistance as in equation (14) below.

$$MRT_{ijt} = P_{it} + P_{jt} = \sum_{m\notin i} \ln T_{imt}\frac{GDP_{mt}}{GDP_{wt}} + \sum_{k\notin j} \ln T_{kjt}\frac{GDP_{kt}}{GDP_{wt}} - \sum_h\sum_z \frac{GDP_{ht}}{GDP_{wt}}\frac{GDP_{mt}}{GDP_{zt}} \ln T_{hzt}. \tag{14}$$

We can easily extend equation (14) to the more general case of bilateral time varying variables G_{ijt} as in equation (15) and importer and exporter multilateral resistance term for the average tariff of exporters $T_{export:jt}$ as in equation (16).

$$MRG_{ijt} = \sum_{m\notin i} \ln G_{imt}\frac{GDP_{mt}}{GDP_{wt}} + \sum_{k\notin j} lnG_{kjt}\frac{GDP_{kt}}{GDP_{wt}} - \sum_{h=1}^{N}\sum_{z=1}^{N} \frac{GDP_{ht}}{GDP_{wt}}\frac{GDP_{mt}}{GDP_{zt}} \ln G_{hzt}. \tag{15}$$

$$MR_{export:ijt} = \ln I_{it}\sum_{m\notin i}^{N} \frac{GDP_{mt}}{GDP_{wt}} + \sum_{k\notin j}^{N} \ln I_{kt}\frac{GDP_{kt}}{GDP_{wt}} - \sum_h\sum_z \frac{GDP_{ht}}{GDP_{wt}}\frac{GDP_{zt}}{GDP_{wt}} \ln I_{ht}. \tag{16}$$

Our estimating equation augmented by the controls for multilateral resistance for all the variables proxying for transport costs:[5]

$$\begin{aligned} \ln v^x{}_{i,j,t} =& \alpha_0 + \alpha_1 \ln importerGDP_{j,t} + \alpha_2 \ln exporterGDP_{i,t} + \alpha_3 \ln distance_{i,j} \\ &+ \alpha_4 commonlanguage_{i,j} + \alpha_5 \ln importer\tau_{i,j,t} + \alpha_6 \ln exporter\tau_{i,t} + \alpha_7\zeta_{i,t} \\ &+ \alpha_8 MR \ln distance_{i,j,t} + \alpha_9 MRcommonlanguage_{i,j,t} + \alpha_{10} MR \ln importer\tau_{i,j,t} \\ &+ \alpha_{11} MR \ln exporter\tau_{i,t} + u_{i,j,t}, \end{aligned} \tag{17}$$

[5] We also run the regression as a robustness check to smooth out imbalances with three years moving averages. The results are almost identical to those presented here.

where MR ln $distance_{i,j,t}$, $MRcommonlanguage_{i,j,t}$, and MR ln $importer\tau_{i,j,t}$ have been constructed following (15),MR ln $exporter\tau_{i,t}$ has been constructed following (16). Also, following Baier and Bergstrand (2009), we impose constraints linking direct terms to MR terms in the estimating equation.[6]

To account for zero bilateral trade flows, we employ a poisson estimator.[7] This implies that we do not take the log of the dependent variable in equation (17). Santos Silva et al. (2006) argue that gravity-type equations should be estimated in their multiplicative form and propose to use a Poisson estimation. Using this methodology is consistent in the presence of heteroscedasticity and provides a way to deal with zero values of the dependent variable.

b. Data

Our trade and tariff data spanning from 1988 to 2002 were obtained from the UN/World Bank WITS database system (World Integrated Trade Solution). The data in WITS come, primarily, from the UNCTAD TRAINS and COMTRADE systems and the World Trade Organization's integrated tariff database (IDB). The data on GDP were obtained from the World Bank's World Development Indicators Database. Geographic data, together with dummies for same language and colonial links, are taken from Clair et al. (2004; http://www.cepii.fr/anglaisgraph/bdd/distances.htm). The distance data are calculated following the great circle formula, which uses latitudes and longitudes of the relevant capital cities. The countries included in the sample are listed in the appendix.[8]

There are several country combinations for which trade data are not reported. Following the recent literature, we assume that these missing observations from the database represent zero trade (Coe et al., 2002; Felbermayr and Kohler, 2004; Baldwin et al., 2007). However, we replace zero observations with missing observations in case a country did not report trade with any other country in a given year since in these cases the data are most probably missing from the database. We use import data as it is likely to be more reliable than export data since imports constitute a tax base and governments have an incentive to track import data. Whenever import data were missing, we used mirrored export data if those were available (this represented only one-half of one per cent of our observations).

c. Results

(i) Aggregate trade

Estimation results for the aggregate export flows are reported in Table 1 where the dependent variable is export flows to the world. Results presented in Table 1 include time and

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[6] $\alpha_1 = 1, \alpha_2 = 1, \alpha_3 = \alpha_8, \alpha_4 = \alpha_9, \alpha_5 = \alpha_{10}, \alpha_6 = \alpha_{11}$.

[7] When examining the global pattern of bilateral trade flows, one striking feature of the landscape is that many country pairs do not trade. See Baldwin et al. (2006) and Baldwin and Harrigan (2007). In our initial sample, 42 per cent of importer–exporter pairings had zero bilateral trade (in our final sample including observations only when tariffs were available the share of zeros was around 20 per cent). Analysing the determinants of trade flows without taking into account potential trade which does not take place between country pairs may bias results. At a minimum, unobserved trade may contain information about the factors driving bilateral trade relationships.

[8] While trade data are available for a wide range of country pairs, the available tariff data are more limited. For this reason, we utilise a standard WITS procedure of matching the nearest adjacent year to represent otherwise missing tariff data. Interpolation is then used for wider gaps.

TABLE 1
Lerner Effects at a Macrolevel

	ln Exports	*ln Exports*
β_1: ln ($own\tau_{it}$)	−0.361*	−0.515**
	(0.210)	(0.215)
β_2: ln ($world\tau_{it}$)	−2.957***	−3.239***
	(0.415)	(0.424)
β_3: ln (*gdp*)	0.896***	
	(0.0946)	
β_3: ln (*population*)		0.499**
		(0.222)
β_4:ζ	−0.173***	−0.170***
	(0.0198)	(0.0202)
β_5: ln ($Wdistance_{it}$)	−0.462***	−1.323***
	(0.149)	(0.146)
Constant	−6.692***	−9.609***
	(1.381)	(1.379)
Observations	1,095	1,137
R^2	0.912	0.581
$F(Pr > 0)$	5.95 (0.00)	5.98 (0.00)
Number of observations	1,095	1,137

Notes:
(i) Standard errors in parentheses.
(ii) Specification includes time and country fixed effects.
(iii) *** $p < 0.01$; **$p < 0.05$; *$p < 0.1$.

country fixed effects. To test the Lerner effect, the average import tariffs of the exporting country were included in the regressions. Two different estimates are presented in Table 1. The difference between the two specifications is that the first specification uses GDP of the exporter country as a proxy for the size of the economy, while the specification presented in column 2 includes population as a proxy for size.

The results of both specifications indicate that the exporting country's own import tariffs have a negative effect on its own exports. Thus, based on our aggregate regression results, we cannot reject that the exporting country's own import policy influences its export performance. Trade costs, such as distance, measured as a GDP-weighted distance from the rest of the world, and the average import tariffs that are applied on the country's exports are both negatively influencing the value of total exports. The variable measuring current account deficit is also negative and significant as expected.

The second column presents results for a specification which uses population as a proxy for size instead of GDP. We estimate this alternative specification as a robustness check of the results presented in the first column as GDP of the exporting country is correlated with distance and also tariffs. The sign and significance of the variables do not change; however, the coefficient of distance and the tariff variables becomes somewhat higher with this specification.[9] Based on these results, the Lerner effect cannot be rejected. Thus, we find evidence that the exporting country's own import tariffs have a negative impact on its exports.

[9] The difference in the coefficients between the two specifications is due to the correlation of GDP of the exporting country with distance and tariffs.

(ii) Bilateral trade

Next, we turn to bilateral trade flows. The first column in Table 2 presents results using poisson estimation including multilateral resistance terms and yearly fixed effects. The results of the bilateral regressions are similar to those found at the aggregate level although the coefficients are somewhat different. Following Baier et al. (2009), the coefficients of the exporter and importer country's GDP are constrained to be one. All the variables have the expected sign and significance. The variable measuring the effects of current account deficit on exports and the coefficient of distance is negative and significant. The coefficient of the exporter country's own import tariff is close to what we found at the aggregate regression and also to the coefficient of the bilateral import tariffs. Both the bilateral tariff elasticity and the exporter country's own tariff coefficient are around −0.6. Thus, these results support the existence of the Lerner symmetry also for bilateral trade flows.

Lerner effects can also be magnified by intermediate linkages, as stressed for example by McKinnon (1966). Given the importance of imported inputs for exports, Lerner effects are likely to be magnified with increasing prevalence of global value chains and production fragmentation. This is also in line with the findings of Johnson and Noguera (2012) who conclude that the content of trade has fallen most in the past two decades among trade partners that have lower trade costs. This also means that the recent work on detailed cross-border value chains (Baldwin and Taglioni, 2011) also has implications at the macroeconomic level for trade balance.

TABLE 2
Poisson Estimates for Bilateral Exports

	Full Sample	*Non-preferential Trade with Non-imputed Tariffs*
α_1: ln $importerGDP_{j,t}$	1	1
	(0.000)	(0.000)
α_2: ln $exporterGDP_{i,t}$	1	1
	(0.000)	(0.000)
α_3: ln ($distance_{ij}$)	−0.609***	−0.500***
	(0.0187)	(0.0208)
α_4: ln ($commonlanguage_{ij}$)	1.041***	0.717***
	(0.0519)	(0.0646)
α_5: ln $importer\tau_{i,j,t}$	−0.627***	−0.607***
	(0.0398)	(0.0479)
α_6: ln $exporter\tau_{i,t}$	−0.582***	−0.408***
	(0.0740)	(0.0435)
α_7:$\zeta_{i,t}$	−0.169***	−0.208***
	(0.0144)	(0.0187)
Constant	11.66***	11.43***
	(0.117)	(0.136)
Observations	106,561	82,625

Notes
(i) Robust standard errors in parentheses.
(ii) Regressions include annual fixed effects and multilateral resistance terms for all trade cost variables.
(iii) *** $p < 0.01$.

(iii) Robustness

A potential endogeneity problem can be present in our bilateral regression. There is a possibility of reverse causality in case bilateral exports would influence import policy and thus bilateral import tariffs.[10] To address this potential reverse causality, we restrict our sample to non-preferential trade flows. The bilateral tariffs applicable in the case of non-preferential trade flows are the most favoured nation tariffs which are not determined by country-pair trade relations but set equally for all partner countries; thus, reverse causality is unlikely. We also omit from the sample imputed missing values as a further robustness check.

The results for this reduced sample are presented in the second column in Table 2. This sample is smaller and includes only non-preferential trade. The results are similar to those using the full sample with the coefficient on the exporter's own tariffs being a slightly lower (−0.408 instead of −0.582). Nevertheless, our results hold. Lerner effects are confirmed based on our results also at bilateral level.

4. SUMMARY

In this paper, we examine linkages between the trade policy of exporting countries and their export performance, both at the aggregate and bilateral level. This involves analytical extension of the classic definition of aggregate effects (linked to Lerner symmetry) to bilateral effects allowing us to use a bilateral gravity model. We test the importance of the exporting country's import policy for its own export performance (the 'Lerner effect' leading to export resistance) both with aggregate and bilateral trade flows. This is based on the theoretical framework developed in the paper. We find at both the aggregate level, and also at the bilateral level, that the trade policy of the exporting countries is a significant factor in explaining export performance. Indeed, given approximate symmetry as suggested by theory, the policy of exporters is as important, econometrically, as policy in import or destination markets. The results imply that, when exploring multilateral or country specific determinants of trade in a gravity context, trade policies in exporting markets deserve place of importance next to trade policies in importing markets. Given the importance of imported inputs for exports, Lerner effects are likely to be magnified with increasing importance of global value chains and production fragmentation.

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[10] Reverse causality is unlikely to be a problem for the exporting country's own import tariffs as this variable is an aggregate tariff over all products, and all import partners thus cannot be influenced by sectoral lobbies or other factors influencing trade policy.

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APPENDIX

TABLE A1
Sample Countries

Reporter and Partner		
Albania	Guyana	Nepal
Argentina	Hong Kong, China	New Zealand
Australia	Honduras	Oman
Austria	Croatia	Pakistan
Belgium	Hungary	Panama
Benin	Indonesia	Peru
Bangladesh	India	Philippines
Bulgaria	Ireland	Papua New Guinea
Bahamas, The	Iran, Islamic Republic	Poland
Bolivia	Iceland	Portugal
Brazil	Israel	Paraguay
Barbados	Italy	Romania
Botswana	Jamaica	Russian Federation
Central African Republic	Jordan	Rwanda
Chile	Japan	Senegal
Cote d'Ivoire	Kenya	Singapore
Cameroon	Korea, Republic	El Salvador
Congo, Republic	Kuwait	Slovakia
Colombia	Sri Lanka	Slovenia
Costa Rica	Lithuania	South Africa
Cyprus	Latvia	Sweden
Czech Republic	Luxembourg	Syrian Arab Republic
Germany	Morocco	Chad
Dominican Republic	Madagascar	Togo
Algeria	Mexico	Thailand
Ecuador	Mali	Trinidad and Tobago
Egypt, Arab Republic	Malta	Tunisia
Spain	Mauritius	Turkey
Estonia	Malawi	Tanzania
Finland	Malaysia	Uganda
Gabon	Namibia	Ukraine
Ghana	Nicaragua	Venezuela
Guatemala	Norway	Zambia
		Zimbabwe
Partner Only		
Fiji	Sierra Leone	United Arab Emirates
Haiti		

Source: Own calculations.