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**Trade Policy Formation when Geography Matters for Specialisation**

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# Trade Policy Formation when Geography Matters for Specialisation

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## Abstract

In this paper, trade policy formation is incorporated into an economic geography model. The political setup used is a modified version of that introduced by Grossman and Helpman (1994) in which policy makers may be influenced by lobbying contributions. On the basis of the underlying trade framework, lobbying activity is performed in benefit of capital interests. Optimal policy outcomes indicate that the largest countries and countries that are disadvantaged by trade regulation favour trade liberalisation. Moreover, the optimal domestic policy is more open to trade when the local and global competition facing domestic firms is less fierce, the welfare dependency on manufacturing imports is larger and when there is a more intense preference for variety in consumption. It is shown that lobbying influence on policy is increasing in the concentration of capital ownership in the population. It is also revealed that, in the cases when domestic special and general interests do not coincide, lobbying activity is performed to liberalise trade. In addition, this actually implies that the presence of lobbying influence on policy raises the long-run national welfare. *JEL classification:* D72, F12, F13 *Keywords:* Economic Geography, International Specialisation, National Welfare, Lobbying Contributions, Market Access Reciprocity

# 1 Introduction

In world trade today, many factors affect a country's trade policy position as policy makers need to consider both foreign policy responses and the domestic voter response to domestic policy. In particular, short-run policy consequences in the form of foreign retaliation and political popularity effects influence the domestic policy outcome no matter whether policy makers act on national welfare-maximising motives or political-economy incentives. The endogenous trade policy literature have identified these factors for traditional trade settings, but no attempt has previously been made to formalise trade policy formation in a trade model where geography matters for international specialisation in the sense that the trade and production pattern depends on national asymmetries in market sizes and trade costs. The fact that many studies have provided empirical support of that geography does matter for specialisation suggests that determinants of trade policy in an economic geography model also plays a role in trade policy formation in practice.<sup>1</sup> The main purpose and contribution of this paper is therefore to formalise trade policy formation in an economic geography model.

The economic geography model used in this paper is a version of the so-called footloose capital model, in which the specialisation pattern depends on national market size and trade cost asymmetries and the long-run production pattern is sustained by international firm movements and capital flows.<sup>2</sup> This model is chosen because, in comparison with the alternative international economic geography model provided by Krugman and Venables (1995), it can be solved analytically. The version of the model used in this paper is provided in Baldwin and Robert-Nicoud (2000) since it facilitates trade policy analysis. Furthermore, the political setup is specified by a lobbying contributions model in which an incumbent government that chooses policy on the basis of welfare considerations also may be influenced by lobbying activity. The political process is formalised as a modified version of the setup used by Grossman and Helpman (1994). In order to comply with the economic geography framework in which there is one specific factor of production, the political setup is simplified so that one lobbying group may influence the government. In the policy formation process, agents are assumed to act on short-run incentives, so that the voter support of incumbents

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<sup>1</sup>Recent empirical economic geography research are provided by Davis and Weinstein (2003) and Redding and Venables (2004). For a survey on earlier contributions on the topic, see Overman, Redding and Venables (2003).

<sup>2</sup>See Baldwin et al. (2003) for a thorough exposition of the footloose capital model, which stems from Martin and Rogers (1995).

are based on short-run policy effects on aggregate welfare and lobbying group members want to influence policy to raise short-run rents. In political science, a large literature provides support of the assumption that voters are short-sighted and that the voter support of incumbents rely on the current state of the economy (which in our model is captured by aggregate welfare).<sup>3</sup> In addition, the short-sightedness of lobbying group members is due to the fact that only short-run gains can be generated from lobbying activity (since long-run factor returns are equalised across countries). The political equilibrium is established in the short run, which is coherent with empirical endogenous trade policy studies showing that policy implementation benefits factors with incomes tied to a particular production in the short-run.<sup>4</sup>

In the economic geography framework, a country with an active manufactures sector has to be large enough to have a non-negligable market size. This implies that we cannot rely on the small country assumption as is standard in the endogenous trade policy literature. Indeed, the domestic relative market size can affect the domestic policy outcome only if the home country has a non-negligable market size. To take trade-policy interactions into account while remaining focused on the domestic political equilibrium, trade policy implementation is assumed to be governed by a market access rule. We find this assumption reasonable since this rule is one of the main policy regulations governing multilateral trade negotiations within the World Trade Organisation (and the former General Agreements on Tariffs and Trade organisation).<sup>5</sup> Intuitively, the domestic equilibrium policy outcome derived under this assumption corresponds to the position that the home country brings to the table in trade negotiations.

This paper is related to three main strands of research. First, it provides a contribution to the endogenous trade policy literature and, within this literature, it is closely related to Fisher and Serra (1996). They use a median-voter approach to establish a country's choice between autarky and free trade in a new trade setting. Their main finding is that a rich country accepts trade with rich or poor trade partners while it rejects trade with middle-income countries. Similar to their

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<sup>3</sup>This literature was founded by Downs (1957) and Key (1966). For a recent survey, see Nannestad and Paldam (1994).

<sup>4</sup>See, for example, the surveys by Hillman (1989), Rodrik (1995) and Gawande and Krishna (2003).

<sup>5</sup>In addition, the most favoured nation rule, which is the other main policy regulation within the multilateral trade negotiation system, is trivially fulfilled in our two-country model of the home country's trade vis-à-vis the rest of the world.

analysis, we identify a country's trade policy position in a trade setting where production is characterised by economies of scale and monopolistic competition. The fact that this is done in an economic geography model however places the role of incremental trade costs in focus and thereby enables the derivation of the endogenous trade policy level as a function of trade-related factors. In addition, it is a well-established fact in the endogenous trade policy literature that trade policies are used as income-redistributive measures in benefit of special interests. Trade policy outcomes identified on the basis of a median-voter approach are therefore likely to be misleading.<sup>6</sup> Second, this paper is related to research on endogenous policy formation in regional economic geography settings. Ottaviano and Thisse (2002) explores the political economy of skilled labour mobility using a political setup where a central authority may restrict skilled labour movements on the basis of lobbying contributions. Their outcomes indicate that no restrictions are placed on skilled labour mobility once regions become sufficiently integrated, which leads to the formation of a core region of economic activity. Robert-Nicoud and Sbergami (2004) examines the political economy of regional subsidies using a probabilistic voter setup where political parties commit to use regional subsidies in order to raise political popularity in electoral competition. In their model, the 'ideological' spread of voter preferences is correlated with regional market size (through the variation of economic activity and the corresponding dispersion of special interests) so that voters in the small region are more easily swayed by regional subsidy benefits. This political advantage is counteracted by the fact that the voter population is smaller in this region, leading to an ambiguous overall effect on the small region's relative political strength. In addition, the relative political strengths of the regions influence the location of production since regional subsidies redistribute income to the politically stronger region. Third, this paper is related to the research field examining effects of firm investments on foreign trade policy formation. Specifically, this strand of research formalises the producer decision to export and/or make direct investments in a foreign market when effects on foreign policy formation is taken into account (so-called "quid pro quo foreign investment").<sup>7</sup> In our trade model, investment decisions are made by individuals with the objective of real return maximisation. We thereby rely on the economic geography framework in specifying linkages between firm movements, foreign investments and trade patterns.

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<sup>6</sup>See Magee, Brock and Young (1989), Helpman (1997) and Persson and Tabellini (2000).

<sup>7</sup>See, amongst others, Bhagwati (1987), Bhagwati et al.(1987), Dinopoulos (1989, 1992), Wong (1989) and Grossman and Helpman (1996).

The rest of this paper is organised as follows. The next section provides a description of the underlying economic geography setting and a characterisation of location equilibria. In section 3, the basic political model is presented and the political equilibria are identified. A concluding discussion is provided in the final section of the paper.

## 2 The trade model

A two-country model is used to represent the home country's trade vis-à-vis the rest of the world. The two countries share identical preferences and technologies but may have different factor endowments. There are two sectors, an agricultural sector in which a homogenous good (the numeraire) is produced under constant returns to scale and perfectly competitive market conditions and a manufacturing sector in which a differentiated good is produced under economies of scale and the Dixit-Stiglitz (1977) form of monopolistic competition. There are two factors of production, labour and capital. Labour is mobile across sectors and immobile across country borders and there is international capital mobility in the sense that immobile capital owners repatriate international investment returns. Since the model is symmetric, only home country conditions are included in the below description. Foreign country variables are denoted  $*$ .

There are international trade costs in the manufacturing sector while the agricultural good is assumed to be costlessly traded for simplification purposes (that will be described in the below introduction of the numeraire sector). Trade costs are of the Samuelson iceberg form so that a proportion of the exported quantity melts away in transit. If denoting the total domestic trade cost level  $\tau$ , where  $\tau \geq 1$ , this implies that a  $1/\tau$  fraction of foreign manufacturing exports arrive at the domestic destination. This trade cost specification is chosen for two reasons. First, it introduces the relevant protection effects on consumer behaviour in a way that considerably simplifies the analysis compared to what could be considered alternative specifications.<sup>8</sup> Second, since this is the standard trade cost specification in the economic geography framework, our policy outcomes are consistent with the general trade and location outcomes in the field.

Domestic consumers share identical preferences  $u$ :

$$u = \varphi M^\alpha A^{1-\alpha}, 0 < \alpha < 1, \quad (1)$$

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<sup>8</sup>To our knowledge, the only contribution providing an alternative trade cost specification in an economic geography framework is provided by Ottaviano et al. (2002).

where  $\varphi$  is a scaling factor,  $M$  is the consumption index of manufacturing varieties,  $A$  is the agricultural consumption, and  $\alpha$  is the expenditure share placed on the manufacturing good. As pointed out by Baldwin and Robert-Nicoud (2000), trade barrier revenues stand for a negligible part of national income in rich, industrialised countries. Since the home country in our model is industrialised with a large market size, it is thereby reasonable to approximate the domestic income as independent of domestic trade barrier revenues in order to simplify the policy analysis. The manufacturing consumption index,  $M$ , is specified as a constant-elasticity-of-substitution function across the large number of produced manufacturing varieties:

$$M = \left( \int_{i=0}^{n+n^*} m_i^{1-1/\sigma} di \right)^{\sigma/(\sigma-1)}, \quad \sigma > 1, \quad (2)$$

where  $n$  is the total number (mass) of domestic firms,  $n^*$  is the total number (mass) of foreign firms,  $m_i$  is the consumption of variety  $i$ , and  $\sigma$  is the elasticity of substitution between any pair of varieties which is inversely related to the preference for variety in consumption. The optimal consumption of agricultural and manufacturing goods is allocated by their Cobb-Douglas expenditure shares. In turn, the optimal consumption of manufacturing variety  $j$  equals:

$$m_h = \frac{(p_h t_h)^{-\sigma}}{\int_{i=0}^{n+n^*} (p_i t_i)^{1-\sigma} di} \alpha E \quad (3)$$

where  $h$  and  $i$  denotes variety types,  $p$  is the producer price of a variety and  $t$  is a trade cost factor that takes the value  $t = 1$  for domestic varieties and  $t = \tau$  for imported varieties. In addition, the price index of the manufacturing consumption index,  $G$ , equals:

$$G = \left( \int_{i=0}^{n+n^*} (p_i t_i)^{1-\sigma} di \right)^{1/(1-\sigma)}.$$

In agricultural production, the unit input requirement is normalised to one. Since agricultural production is characterised by constant returns to scale and perfect competition and the agricultural good is numeraire, this implies that each agricultural worker is paid a unit wage. It is assumed that each worker supplies his labour inelastically at this wage. The agricultural good is assumed to be costlessly traded to ensure that domestic and foreign wages are equalised when the agricultural sector is active in each country.<sup>9</sup> In this paper, focus is placed on two coun-

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<sup>9</sup>Effects of allowing for trade costs on the numeraire good in the new economic geography framework are explored by Davis (1998) and Fujita, Krugman and Venables (1999).



tries where both sectors are active for two reasons. First, we want to allow for internal income redistributive effects of policy in identifying policy equilibria. Second, it appears unreasonable to work with a model setup where the rest of the world is completely specialised in one sector. Analytically, we obtain this restriction on the production pattern by assuming that the global manufacturing sector is too small for one country to become complete specialised in manufacturing production.<sup>10</sup>

In the manufacturing sector, it is costless to develop a new variety. Since all varieties are demanded, each firm therefore chooses to produce its own variety. Firms act non-strategically in the sense that they do not perceive that their price setting has any influence on the manufacturing price index. This assumption, which is reasonable considering the large number of firms, implies that each producer perceives  $\sigma$  as the elasticity of demand for its variety.<sup>11</sup> In producing a variety, one unit of capital is required to cover the fixed setup costs and the variable costs are  $\beta$  labour units per unit of output. Since one capital unit is used in the production of each variety and each variety is produced by one firm, the global number of firms equals the global capital endowment:

$$n + n^* = K + K^*. \quad (4)$$

where  $K$  is the domestic capital endowment and  $K^*$  is the foreign capital endowment. Since firms face identical producer conditions in the same location and the varieties enter symmetrically into demand, producer prices are identical for manufacturing firms in the same country. Since the market for manufacturing varieties is characterised by monopolistic competition, a domestic producer's first-order profit-maximising condition equals:

$$p(1 - 1/\sigma) = \beta w$$

where  $p$  is the domestic producer price and  $w$  is the domestic wage. To simplify without loss of generality, we choose output units so that  $\beta = (1 - 1/\sigma)$ . Due to this normalisation and the unit wage, the domestic producer price equals one. Because of the symmetry of the model, the producer price of foreign varieties also equals one and since there are iceberg trade costs on manufacturing varieties, the domestic market price

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<sup>10</sup>This non-full specialisation condition corresponds to the analytical restriction that the domestic and foreign expenditure, respectively, exceeds the global manufacturing expenditure.

<sup>11</sup>See Helpman and Krugman (1985) for a detailed exposition of the Dixit-Stiglitz (1977) form of monopolistic competition.

of foreign varieties equals  $\tau$ . Likewise, the foreign market price on domestic varieties equals the foreign trade cost level,  $\tau^*$ .

Market clearing implies that the equilibrium output of a domestic variety,  $x$ , equals:

$$x = \frac{1}{(n + n^*\tau^{1-\sigma})}\alpha E + \frac{\tau^{*1-\sigma}}{(n^* + n\tau^{*1-\sigma})}\alpha E^* \quad (5)$$

where the right-hand side terms capture the total production for the home market and the foreign market. To simplify the policy analysis, we follow Baldwin and Robert-Nicoud (2000) in using  $\theta = \tau^{1-\sigma}$  and  $\theta^* = \tau^{*1-\sigma}$  as measures of the domestic and foreign trade freeness levels.

Since one capital unit is required to produce a manufacturing variety, capital market competition implies that the operating profits of production are acquired as rent on the capital investment. In turn, using the  $\beta$  normalisation and the facts that the wage and producer price equals unity implies that the domestic rent,  $r$ , is equal to:

$$r = x/\sigma. \quad (6)$$

Capital owners maximise their real investment returns, and since foreign rents are costlessly repatriated, this objective is attained by nominal rent maximisation. In the long run, capital owners are assumed to move their investments between countries in response to a positive rent gap. This modification of the Baldwin and Robert-Nicoud (2000) model is done to enable the identification of capital ownership across location equilibria and can be seen as reasonable considering that repatriation costs on capital, though small, exists in reality.<sup>12</sup> In the long run, the nominal rent maximisation of investors implies that domestic and foreign rents are equalised in equilibrium. Likewise, firms can adjust their behaviour on the basis of profit-maximising incentives and alter their location choice in the long run.

Total domestic expenditure consists of total domestic factor income:

$$E = L + (\gamma r + (1 - \gamma)r^*)K \quad (7)$$

where  $L$  is the domestic labour force,  $\gamma$  is the domestic investment share of domestic capital owners and  $K$  is the domestic capital endowment. Market clearing in the agricultural sector implies that the global agricultural production value equals the global agricultural expenditure:

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<sup>12</sup>I.e. zero repatriation costs are assumed to simplify the model setup while the assumption that a strictly positive rent gap is required for capital movements would be equivalent to assuming that rents are repatriated at infinitesimal costs.

$$Y + Y^* = (1 - \alpha) (E + E^*). \quad (8)$$

In equilibrium, the domestic aggregate welfare equals:

$$W = E \left( n^G (s_N + (1 - s_N) \theta) \right)^{\frac{\alpha}{\sigma-1}} \quad (9)$$

where the second factor of (9) captures the overall price effect on welfare and  $n^G$  is the global number of firms (and the global number of varieties) and  $s_N$  is the domestic firm share. As can be seen from (9), the domestic aggregate welfare is increasing in the total domestic expenditure, the global number of varieties, the domestic firm share and the domestic trade openness level. Moreover, the manufacturing expenditure share and the preference for variety in consumption amplifies the manufacturing price index effect on welfare. A raised domestic expenditure level implies that the consumer possibilities are enlarged in the home country. In addition, due to the love for variety in consumption, consumers gain from a larger set of varieties being available for consumption. Consumers also benefit from a reduced manufacturing price index, which may be due to a higher domestic firm share as trade-cost inclusive prices have to be paid for a smaller share of varieties and an enlarged domestic level of trade freeness as this decreases the trade cost levied per unit of imports.

A global equilibrium is characterised by (5),(6),(7),(8), and their foreign counterparts. The endogenous variables are the agricultural and manufacturing variety output levels, the expenditure levels, the rents and the number of firms in each location while the exogenous variables are the capital and labour endowments, the Cobb-Douglas expenditure shares, the elasticity of substitution between varieties, and (in solving for location equilibria) the domestic and foreign trade freeness levels. As previously described, as short-run equilibrium may be characterised by a rent gap while nominal rent maximisation implies that the long-run equilibrium is characterised by an international rent equalisation.

## 2.1 Long-run equilibrium outcomes

The only endogenous variables depending on trade freeness levels in long-run equilibrium are the number of firms in each location. It can be seen from (6) and its foreign counterpart that the long-run rent equalisation implies that domestic and foreign firm output levels are equal, which in turn indicates that the production pattern is captured by the relative firm location. In long-run equilibrium, the domestic firm share depends

on the domestic expenditure share and the domestic and foreign trade freeness levels:<sup>13</sup>

$$s_N = \frac{(1 - 2\theta + \theta\theta^*)}{2(1 - \theta)(1 - \theta^*)} + (s_E - 0.5) \frac{(1 - \theta\theta^*)}{(1 - \theta)(1 - \theta^*)} \quad (10)$$

where  $s_E$  is the domestic expenditure share and (10) is valid for  $0 \leq s_N \leq 1$ . The domestic firm share is increasing in the domestic expenditure share and the foreign trade freeness level and is decreasing in the domestic trade freeness level. The second term, which is positive if the home country has the larger expenditure share and negative otherwise, indicates that there is a market size advantage for manufacturing production. This outcome is standard in the economic geography framework and relies on the fact that overall demand for the manufacturing good is larger in the larger market. If trade costs are symmetric, this implies that the larger country is specialised in manufacturing production. Specifically,  $s_N = 0.5 + (s_E - 0.5)(1 + \theta)/(1 - \theta)$  when  $\theta = \theta^*$ , so that the largest country's manufacturing production exceeds that of the smaller country with a fraction that is proportionately larger than the market size gap between countries (this is the so-called home market effect). The domestic firm share is larger with a higher foreign trade freeness level as less protection is levied on domestic exports and with a lower domestic trade freeness level as more protection is levied on foreign exports.<sup>14</sup> That is, the more protected market provides a better export base in the sense that the trade cost per unit of exports is lower in that location. If market sizes are equal, this implies that the more protectionist country is specialised in manufacturing production. (This can be seen from the first right-hand side term, which is positive if the home country is more protectionist and negative otherwise).

The direction and size of international capital flows can be identified by the following expression:<sup>15</sup>

$$s_N - s_K = \frac{(\theta + \theta^* - 2\theta\theta^*)}{(1 - \theta)(1 - \theta^*)} s_E - \frac{\theta}{(1 - \theta)} - \frac{\sigma - \alpha}{\sigma} (s_K - s_L) \quad (11)$$

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<sup>13</sup>This equation is derived using (5), (6), (7) and their foreign counterparts combined with the implication that output levels are equalised.

<sup>14</sup>See Baldwin et al. (2003) for an exposition of this typical feature caused by trade cost asymmetry in the new economic geography framework.

<sup>15</sup>This expression is obtained by first subtracting  $s_K$  from each side of (10), and then substituting part of the domestic expenditure share for its long-run factor endowment share equivalence  $s_E = \frac{\sigma - \alpha}{\sigma} \left( s_L + \frac{\alpha}{\sigma - \alpha} s_K \right)$ .

where  $s_K$  and  $s_L$  are the domestic endowment shares of capital and labour. Since each firm uses one unit of capital,  $s_N - s_K$  captures the (possibly negative) domestic capital inflow as a share of the global capital endowment. The production pattern is sustained by capital movements, so that the domestic capital inflow is positively affected by the domestic expenditure share and the foreign trade freeness level and negatively influenced by the domestic trade freeness level. In addition, the domestic inflow of capital depends negatively on the domestic capital to labour endowment share difference,  $s_K - s_L$ , which effectively captures the extent to which the domestic capital/labour ratio exceeds that of the foreign country. If the home country is relatively well endowed with capital (labour), this places a downward (upward) pressure on the domestic capital inflow. This effect captures that local firm sales are lower in the country which is relatively well endowed with capital,<sup>16</sup> which in turn places a downward pressure on relative firm operating profits in the country and thereby lowers the relative rent on local investments. If market sizes and trade cost levels are symmetric, this local competition effect therefore gives rise to a capital outflow from the country which is relatively well endowed with capital until rent equalisation is established in equilibrium.

As previously described, trade-policy interactions are conditioned by market access reciprocity, and since the most-favoured-nation rule is trivially fulfilled in our two-country setting, the two main WTO regulations governing trade-policy implementation in practice are validated by our framework. Trade cost levels consistent with market access reciprocity are specified as yielding preset terms of trade  $\varsigma$ , where  $\varsigma = \tau/\tau^*$ . It can be noted that trade cost reciprocity, which corresponds to the symmetric trade cost specification that is standard in the economic geography framework, is a special case of market access reciprocity with  $\varsigma = 1$ .

### 3 The basic policy model

As previously described, the political setup of this paper is a modified version of the Grossman and Helpman (1994) model in which an incumbent government may be influenced by lobbying activity. The government acts on welfare considerations and may be affected by lobbying contributions that can be used for political campaigns.<sup>17</sup> It is

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<sup>16</sup>This can easily be seen from  $E/n = wL/K + r$  and  $E^*/n^* = wL^*/K^* + r^*$  since  $K/L > K^*/L^*$  implies that  $E/n < E^*/n^*$  when factor prices are equalised.

<sup>17</sup>Contributions can be used to finance future campaigns and/or debts from previous elections. Grossman and Helpman (1994) also mention political motives of acquiring contributions to deter electoral competition and/or establish political cred-

assumed that the domestic lobbying group represents domestic owners of the specific factor of production, capital. In turn, the objective of the lobbying group is to maximise total member welfare net of contributions. The government preferences are based on short-run incentives which, as previously explained, is coherent with the large literature based on the short-sightedness of voters. The lobbying group is also focused on short-run consequences of policy, which is coherent with the trade model in the sense that only short-run gains can be made from affecting policy. The political equilibrium is established in the short run, which is an assumption in line with results from numerous empirical endogenous trade-policy studies showing that trade policy benefits factors with incomes tied to a particular production in the short run. In the short-run political equilibrium, there are two main policy effects on individual welfare. First, there is an expenditure effect based on the policy influence on individual equilibrium income. Since the unit wage is independent of levels of trade freeness, only rental income enters into this effect. Second, there is a common policy effect on the manufacturing price index as domestic import prices are decreasing in the home country's level of trade freeness.

The political process takes the form of a two-stage noncooperative game. In the first stage of the game, the lobbying group provides the government with a contribution schedule mapping contribution levels to policy positions. The lobbying group knows the government preferences and constructs the contribution schedule (which may contain zero offers at some policy levels) while taking the anticipated government behaviour into account. In the second stage, the government sets policy given the contribution schedule and collects the offered contribution. The preferences of policy makers incorporate the national aggregate welfare, either on the basis of voter support or altruistic motives, and total lobbying contributions:

$$\Psi(\theta) = C(\theta) + aW(\theta), \quad a > 0, \quad (12)$$

where  $\Psi$  are the government preferences,  $C$  are the total lobbying contributions and  $a$  is the government preference for aggregate welfare. If  $a$  exceeds (is below) one, policy makers place a higher (lower) value on a dollar of voter welfare than on a dollar of lobbying contributions. From the short-run perspective of policy makers, (9) contains two variables. These variables are the domestic expenditure level and the domestic level of trade freeness. Using (9) and an expenditure share equivalence

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ibility.

of domestic expenditure,<sup>18</sup> it can be shown that the optimal domestic policy position equals:

$$\theta = \frac{1}{n^G (1 - s_N)^\sigma} \left( \frac{\sigma - \alpha}{\sigma \alpha s_E} \frac{\partial E}{\partial \theta} \frac{K^G}{L^G} \right)^{\sigma-1} - \frac{s_N}{(1 - s_N)} \quad (13)$$

Since  $0 \leq \theta \leq 1$ , it can be seen from (13) that the equilibrium level of domestic trade freeness is defined for a range of positive expenditure effects, indicating that policy makers want to use as extensive a protectionist policy as possible when the expenditure effect is below a small threshold level and liberalise trade as much as possible when the expenditure effect is large enough. In the intermediate range over which (13) is defined, the optimal domestic trade freeness level is decreasing in the global number of varieties, the domestic firm share, the manufacturing good expenditure share in consumption, the domestic expenditure share and the global capital/labour ratio and is increasing in the magnitude of the expenditure effect and in the elasticity of substitution between manufacturing varieties. It is optimal for the home country to use a more protectionist policy when there is fiercer global competition between firms because of a larger number of varieties for consumers to choose from and lower sales per firm with a larger global capital to labour ratio. Furthermore, the home country is more protectionist when there is a fiercer domestic competition due to a larger domestic firm share. In addition, the domestic optimal policy is more protectionist with a higher manufacturing expenditure share as this increases the influence of the manufacturing price index on welfare so that the domestic aggregate welfare becomes more sensitive to the location of manufacturing production. A larger domestic expenditure share also leads the home country to be less open to trade in political equilibrium since, given that the expenditure effect captures the influence of the relative domestic market size on factor income, a higher domestic expenditure share merely captures that the domestic gains from trade on the basis of consumption of imports is reduced. Moreover, a higher elasticity of substitution between manufacturing varieties enhances the restrictiveness of protection and thereby increases the optimal level of domestic trade freeness.

The policy equilibrium displays the fact that it may be optimal for a large country to use protection. Similarly to the literature on the optimal tariff argument,<sup>19</sup> the home country's use of protection can be motivated

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<sup>18</sup>This equivalence is equal to  $E = s_E E^G$ , where the global long-run expenditure equals  $E^G = \frac{\sigma}{\sigma - \alpha} L^G$ .

<sup>19</sup>The optimal tariff argument states that it is optimal for a large country to use protection because the induced demand shift towards domestic products places a down-

by the fact that an unilateral increase in domestic protection triggers an overall demand shift towards domestic manufacturing varieties which increases the relative domestic profitability of manufacturing production. In the short-run economic geography framework, the domestic unilateral use of protection raises the domestic rent and lowers the foreign rent. Unless a relatively large share of the domestic capital ownership is invested abroad, the raised domestic rent implies a larger domestic expenditure, which feeds onto domestic aggregate welfare. This outcome can be interpreted as general if considering that an extreme capital outflow from a rich, industrialised country is unusual in practice. Nevertheless, the exceptional outcome in which the domestic expenditure level is negatively affected by unilateral domestic protection accentuates the fact that domestic policy makers need to take policy effects on foreign producer conditions into account when domestic inhabitants make international investments.

As previously described, the lobbying group maximises the total welfare of its members net of contributions when taking into account the anticipated political optimisation. Since the lobbying group has perfect information of government preferences, it designs its contribution schedule to maximise the joint benefit of its members and the government. This way, the lobbying group incorporates the interdependency between the government's and its own objective to ensure that the domestic policy choice leaves no unexploited profit opportunities. This joint optimisation is characterised by the maximisation of the weighted welfare function  $W_\theta$ :

$$W_\theta = W_o(\theta) + aW(\theta) \quad (14)$$

where  $W_o$  is the total welfare of domestic capital owners (where the o subscript denotes organised interests), which is equal to:

$$W_o = E_o \left( n^G (s_N + (1 - s_N) \theta) \right)^{\frac{\alpha}{\sigma-1}} \quad (15)$$

where  $E_o$  is the total expenditure of lobbying group members. Since the political equilibrium is characterised by the simultaneous maximisation of (12) and (14), it can easily be shown that the following condition holds:

$$\frac{\partial W_o(\theta)}{\partial \theta} = \frac{\partial C(\theta)}{\partial \theta} \quad (16)$$

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ward pressure on foreign producer prices. See, amongst others, Johnson (1953/1954), Gorman (1958), Horwell (1966), Tower (1975), Kennan and Riezman (1988), Lockwood and Young (2000) and Syropoulos (2002).



so that a marginal policy change at the political equilibrium leads to an alteration in lobbying contributions that exactly offsets the total welfare change of domestic capital owners. The contribution schedule is therefore locally truthful around the equilibrium policy point, implying that the government's political optimisation yields:

$$\frac{\partial W_o(\theta)}{\partial \theta} + a \frac{\partial W(\theta)}{\partial \theta} = 0. \quad (17)$$

Using (9) and (15) in (17) to solve for the equilibrium policy while substituting expenditure levels for expenditure share equivalences yields the same expression as the optimal policy in (13) with the additional factor  $((1 + a) / (v_o + a))^{\sigma-1}$  multiplied with the first term, where  $v_o$  is the domestic expenditure share of politically organised inhabitants.<sup>20</sup> It can easily be seen that the domestic expenditure share of capital owners is equal to one if each domestic inhabitant owns some capital. In this case, the optimal policy coincides with the policy preferred by lobbying group members since the special interest of capital interests is equivalent to the general interest of the population in the home country. The lobbying group therefore has no incentive to influence policy makers and a zero contribution is provided to the incumbent government in political equilibrium. A prerequisite for lobbying activity to occur is therefore that there is a concentration of capital owners in the population. Furthermore, the lobbying influence on policy is larger, the more concentrated are capital ownership in the population. This outcome, which is coherent with that obtained by Grossman and Helpman (1994) in determining the trade policy structure in a specific factors trade model, is due to the fact that the deviation between the optimal policy and the policy preferred by domestic capital interests grows as the domestic expenditure share of lobbying group members decreases. Analytically, this outcome can be seen from the fact that the additional factor is raised by a reduced expenditure share of politically organised interests.

In the presence of lobbying activity, the additional factor exceeds one so that the home country is more open to trade in political equilibrium. This outcome is due to the fact that individual gains from trade are increasing in the magnitude of the individual (positive) expenditure effect. In turn, since the lobbying influence is increasing in the concentration of capital ownership, the equilibrium policy is more liberalised with a smaller share of capital owners in the population. Likewise, the home country is less open to trade in political equilibrium with a higher

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<sup>20</sup>These equivalences are equal to  $E_o = v_o \frac{\sigma}{\sigma-\alpha} s_E L^G$  and  $E = \frac{\sigma}{\sigma-\alpha} s_E L^G$ .

government preference for aggregate welfare. While the lobbying group exerts a trade-liberalising influence on policy in this case, the policy effect per unit of contribution decreases with the government preference placed on aggregate welfare.

## 4 Concluding Discussion

In this paper, factors determining trade policy are identified in an economic geography framework where the international specialisation pattern is sustained by international capital movements. Since an industrialised country's market size is non-negligable in this framework, its policy choice affects both its internal income distribution and foreign producer conditions. From a national welfare perspective, it may therefore be optimal for the industrialised country to use protection as the resulting expenditure shift towards production in the protected sector goods benefits domestic firms as well as the population at large.

To add a general equilibrium flavour to domestic policy formation, unilateral protection levels are assumed to fulfil a market access reciprocity rule. This condition is reasonable considering that the market access reciprocity rule is one of the two main regulations governing trade negotiations in the WTO. In fact, Bagwell and Staiger (1999) show that, together with the most-favoured-nation rule that is trivially fulfilled in our model of a country's trade position vis-a-vis the rest of the world, this rule provides the economic foundation of an efficient multilateral trade liberalisation in the trade negotiation system. Incorporating the market access reciprocity rule into our trade model indicates that the domestic expenditure effect is determined by a combination of relative market sizes and the terms-of-trade stipulated by the market access reciprocity rule. In turn, this implies that the domestic expenditure effect is negative only if the home country has a relatively small market and/or the international policy regulation benefits the home country. The optimal domestic policy is therefore protectionist only if the home country is relatively small and/or has a policy advantage stipulated by the market access reciprocity rule. This outcome suggests that the relationship between country size and outcomes of strategic trade-policy games identified in neo-classical trade settings may be invalid in the economic geography framework. Specifically, for neoclassical models, it has been shown that the welfare gains of using protection hinges on the relative market size of countries in the sense that only the larger trade partner can be certain to benefit from a 'tariff war' (See Syropoulos (2002)).

The optimal level of domestic trade freeness is increasing in the domestic expenditure effect and the preference for variety in consumption.

Competition facing domestic firms affect the optimal domestic level of trade freeness negatively. Specifically, the domestic firm share leads to a fiercer local competition while a larger number of global varieties and a higher global capital to labour endowment ratio increases the international competition of domestic firms. A larger domestic expenditure share also leads the home country to be less open to trade by reducing the domestic gains from trade. Since the expenditure effect is negative (positive) when the home country is relatively small (large) and/or it has a policy advantage (disadvantage), rents on investments in domestic production are raised by domestic protection (trade liberalisation) in this case. Due to the symmetry of the model, rents on domestic and foreign investments are adversely affected by domestic policy. This implies that the domestic policy partly benefits foreign producers if domestic inhabitants make foreign investments. In the realistic case when domestic policy affects the domestic rent and the domestic expenditure in the same direction, larger countries will favour a liberalising policy stand and smaller countries will favour protection in the sample of large, industrialised countries considered in this paper. The largest and richest countries in the world appears to lead the trade liberalising process, at least insofar as determining the agenda.<sup>21</sup> In retrospective, the global trade liberalisation that has been taking place over the last decades have clearly occurred with these countries consent. Furthermore, the fact that these countries constitute large markets implies that they are attractive trading partners and therefore have a relatively larger bargaining power compared to other countries. Whether a country's protection level is decreasing in its market size amongst large, industrialised countries however remains an empirical issue to be explored by future researchers.

The lobbying group may find it worthwhile to influence the domestic policy position, if the domestic expenditure effect is not sufficiently small or large for domestic special interests to coincide with the general voter interest. In addition, lobbying activity occurs only when domestic capital ownership is concentrated in the population. As in Grossman and Helpman (1994), the intensity of lobbying group activity is increasing in its member share of the population. And, as naturally follows from the fact that government preferences are equivalent with a weighted average of total lobbying member welfare and aggregate voter welfare, the lobbying influence on policy is decreasing in the government preference for aggregate welfare. In the economic geography framework, the special interest of capital owners can differ from the general interest of domestic voters only if the home country is relatively large and/or it has a

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<sup>21</sup>This controversial issue is f.ex. taken up in Stiglitz (2002).

policy disadvantage. Since the lobbying group is active only if capital interests are concentrated, and investors in domestic production benefits from trade liberalisation in the case when the lobbying group's policy position differ from the optimal policy stand, the lobbying group always imposes a trade liberalising influence on policy when it is active. Though the lobbying group acts in the exclusive interest of its members, the effect of lobbying activity on policy in fact increases the domestic long-run welfare by making the home country a more attractive location for manufacturing production. Lobbying activity thereby leads to a policy position which is more open to trade and creates larger long-run gains for the population compared to a political setup in which policy makers cannot be influenced by lobbying contributions.

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