Barriers to FDI, investment agreements and foreign lobbying.

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Abstract

Foreign Direct Investment (FDI) has surged but various entry barriers remain. Investment agreements aim at partly removing these restrictions. We develop a new model in which governments regulate the entry of foreign affiliates that want to compete with national producers. National firms and foreign affiliates can form lobbies to lower or reinforce these restrictions. Affiliates can repatriate part of their profits in their country of origin. We show that (i) entry restrictions are chosen to prevent foreign affiliates from decreasing national firms' profits while repatriating their profits abroad, and that (ii) in a coalitional bargaining model, the government might prefer avoiding costly negotiations for an agreement if foreign lobbying sufficiently lowers the restrictions. Agreement negotiations are however more likely when the government might be punished for accepting foreign contributions, except if a sub-coalition between the government and the foreign lobby is formed. Considering the impact of taxes in the repatriation behaviour, we show that foreign entry is more restricted when national revenues rather than domestic profits are taxed. Finally we use two proxies for the repatriation behaviour to provide empirical evidence that profits' repatriation affects the choice of FDI restrictions.

1 Introduction

Foreign Direct Investment (FDI) has surged but various restrictions on FDI flows remain. Investment agreements aim at partly removing these restrictions. In this paper we study the rationales behind FDI restrictions and the need for agreements to lower these barriers. The following quote from the Economist illustrates the problem.

"Given the success some Indian companies are now having on the world stage, India's fear of foreign competition at home seems odd. It is time for the country's politicians to sweep away such protectionism for good, and declare that India is as ready to take on the world in business as its World Cup-winning team is in cricket."[1]

This paper studies the reasons why countries choose high barriers to FDI and considers both the economic and political aspects of FDI barriers and investment agreements. We particularly focus on horizontal FDI that allow multinational firms to open foreign affiliates and reach consumers from other countries. FDI barriers are chosen by governments and restrain the free entry of foreign firms in a domestic market. They mainly aim at protecting the existing national firms' profits. These barriers are subject to intense lobbying from both the national firms and the foreign firms that want to enter and compete with the national firms. However national and foreign lobbying efforts are differently perceived and valued. For example, a few years ago Alibaba hired a very influential lobbying firm when planning for a potential takeover bid for Yahoo. The news was largely covered in the media[2] and the coverage showed a certain suspicion around foreign lobbying especially from Chinese firms.

Compared to the rest of the literature, we highlight two aspects of horizontal FDI: profits might be partly repatriated in the country of origin and there exist an aversion towards foreign influence translated into governments to be punished for accepting foreign contributions. These aspects define the rationales behind FDI restrictions and the need or not for agreements to lower these barriers.

First we show that a positive level of repatriation of profits can explain socially inefficient FDI barriers. Governments play a Nash game in which domestic profits made by foreign affiliates are repatriated. The profits of national firms' affiliates are repatriated home but do not affect the decision of the government when choices are made simultaneously in the two country. The government only value the profits that depend on his policy and stay in the country. The repatriation of foreign affiliates' profits abroad reduces the way the government value their profits when choosing his policy. The benefits of lowering restrictions are then reduced. On the one hand, foreign firms benefit the economy by lowering prices but on the other hand they compete with national firms and lower their profits that are redistributed to domestic consumers. Governments then reduce foreign entry in order to increase the domestic profits of national firms. However this policy is inefficient because the repatriated profits made abroad by national

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[1]from *India and foreign investment, Fling wide the gates* in *The Economist*, Apr 14th 2011.

[2]cf the article in the New York Times, "Alibaba Taps Lobbying Firm" by Ben Protess on December 29th, 2011. In addition the idea of an American media to be controlled by a Chinese firm was expected to face obstacles in Washington.This example is particular given the prominent role of the Chinese government in his economy and the role of a large media company but still shows that foreign firms face difficulties to invest in the US and that their lobbying activity is particularly covered in the media.

firms are not taken into account. Each government unilaterally decides to increase foreign entry barriers whereas less restrictive policies and free-entry would be preferred. In that case an investment agreements solves for the prisoner's dilemma problem and allow countries to lower entry rules. However agreement negotiations are costly and an agreement might become needless when foreign lobbying itself lowers restrictions and mitigates the externality problem. This is an interesting dimension of foreign lobbying, especially when negotiations between governments are long and costly.

However foreign lobbying faces a certain aversion of governments towards foreign influence that mitigates its efficiency. If the aversion towards foreign influence is strong, foreign lobbying becomes inefficient. An agreement might then be preferred to solve for the initial prisoner's dilemma. There exists only poorly documented evidence that foreign lobbying differently affects public policies. First formal factors restrict foreign activities. For example regulations in 1938 and in 1966 were passed by the Congress in the United-States to restrict and ban foreign lobbying are well explained in Corrado et al. (1997) that study the foreign influence in the United States. Limits on foreign political contributions started in 1938 in order to prevent Nazi money from influencing the political debate. Congress passed the Foreign Agent Registration Act that required agents of foreign entities engaged in "political propaganda" to register and disclose their activities. Later on, bans on political contributions in any US election by any foreign government, political party, corporation, or individual were passed. Nowadays all lobbying expenditures have to be registered and the country of origin is to be mentioned according to the Lobbying Disclosure Act. The previous Alibaba example illustrates a certain suspicion surrounding foreign lobbying. This suspicion might be counterproductive. As opposed to national lobbying, foreign lobbying might push the government to lower restrictions. Both the repatriation of profits and the aversion towards foreign lobbying affect the need for an agreement and the positive role of foreign lobbying to solve the prisoner's dilemma due to a positive repatriation of foreign affiliates' profits.

In a last part we add two extensions to the model. The first extension shows that in a coalitional bargaining model, sub-coalitions between the government and one of the two lobbies only might form when there is an aversion towards foreign influence. This differs from the bargaining when there is no such aversion. In that case the bargaining between the three players is always the efficient solution. In this part we show that a sub-coalition between the government and the national lobby might form and lead to high entry restrictions whereas a sub-coalition between the government and the national lobby leads to low entry restrictions. Agreement negotiations are more likely in the first case whereas they might be too costly in the second one.
A second extension adds the possibility for the government to choose tax rates that directly affect the repatriation behaviour of multinationals. We study two types of taxes and their effect on the choice of FDI restrictions. We show that the repatriation of profits increases and foreign entry is more restricted when national revenues rather than domestic profits are taxed .

To conclude empirical evidence are provided to show that the repatriation of profits affects the level of FDI restrictions. We use two proxies for the repatriation behaviour: the difference in corporate tax rates and the difference in growth opportunities. Using a fixed-effect model we show that a higher repatriation of profits increases FDI restrictions. The lack of large databases is a barrier to further study how multinationals' behaviour affects the choices of governments.

The paper is organized in four parts. First I describe the non-cooperative model when gov-

ernments simultaneously choose their polices through a domestic bargaining game with their lobbies. Then governments have the possibility to cooperate and commit to an agreement. The third part adds two extensions: an aversion toward foreign influence and the possibility for governments to choose tax rates to affect the repatriation behaviour. The last part provides evidence that a higher repatriation of profits affects FDI restrictions.

2   Literature

There is a long literature on the rationales why countries negotiate over tariff reductions to explain the successes of GATT/WTO negotiations. The standard theory explains that countries impose tariffs to gain over other countries by manipulating their terms-of-trade (Johnson (1953-54), Grossman and Helpman (1995), Bagwell and Staiger (1999)). These models argue that it is the only trade policy externality these negotiations are about. Another theory of trade agreements has been developed by Maggi and Rodriguez-Clare (1998) and Maggi and Rodriguez-Clare (2007). Agreements allow governments to tie their hands vis-a-vis lobbying pressures that create long-term economic inefficiencies. More recently Ossa (2011) offers an additional explanation to complement the standard terms-of-trade theory by building on the Krugman 'new trade' model. Tariffs are then chosen to host more of the world's manufacturing firms. When governments do not cooperate countries impose inefficiently high tariffs because they want to attract firms to locate in the home country. An agreement solves for this externality. More recently, Mrazova (2009) and Mrazova (2011) use oligopolistic models and show that profit-shifting from the foreign firms towards the domestic firms is a rationale for protectionism. Our paper differs by studying the trade policy defined like the number of foreign firms allowed to enter the country. In addition the profit-shifting emerges between domestic firms between the national firms and the foreign affiliates in the same country. This strand of the literature only focuses on tariffs and GATT/WTO negotiations. Nowadays, most of the tariffs are very low and negotiations focus on other types of trade barriers. In addition it does not explain the GATS negotiations on services. One major difference between trade in goods and services comes from the fact that tariffs mostly do not apply for services which are provided through commercial presence. This paper therefore aims at answering the following question "Are services agreements different because services are provided through affiliates?" from Mavroidis (2011). We offer a new model to understand negotiations for horizontal FDI barriers.

In our model we focus on FDI barriers given that FDI has surged over the last decades whereas various restrictions on FDI flows remain. We offer a new rationale that motivates negotiations over FDI barriers. To our knowledge, no paper has offered such an explanation. In addition we study the interactions between this new externality and the existence of lobbying pressures. Maggi and Rodriguez-Clare (1998) argue that governments do not want to commit because they get positive contributions from playing the lobbying game. In addition we suggest a new role for lobbying. Our model shows that foreign lobbying by indirectly pushing towards less restrictive policies solves for the initial inefficiency an agreement is about. This aspect is new in the literature.

Lobbying has been extensively studied, but few papers have focused on foreign lobbying. Gawande et al. (2006) is one among the few that empirically shows a positive impact of foreign lobbying on trade barriers in the US. Our contribution is first to distinguish between domestic and national lobbies. With horizontal FDI taking place, domestic lobbies represent national firms and foreign

affiliates producing in one country. In this paper we clearly study the particular role of foreign lobbying. Similarly to Gawande et al. (2006), foreign lobbying lowers trade barriers but it might also remove the externality problem that justifies the need for an agreement. Several papers Conconi (2003), Antràs and Padró i Miquel (2011), Aidt and Hwang (2008) and Aidt and Hwang (2014) have highlighted the positive role of foreign influence on trade policies. Compared to the others Antràs and Padró i Miquel (2011) develops a political model with a voting mechanism and considers government to government pressures instead of a foreign lobbying channel. In addition we study the impact of the aversion towards foreign lobbying on the public policies and the formation of lobbying coalitions. We model this aversion or national preference as a probability for governments that value foreign contributions to be punished. In the paper we tackle the issue of lobby formation and the free-rider problem. Bombardini (2008) deals with the lobby formation by having a cost of channeling political contributions and heterogenous firms. Given this fixed costs it is efficient for the least productive firms not to participate. In this paper we do not have a fixed cost of lobbying however some foreign firms free ride in a model with an order of entry. The first affiliates to enter does not participate in the lobby even if they might benefit from the foreign lobbying. Some firms might even lobby for more restrictions in order to lower the domestic competition and behave like another national firm.

Finally International ownership and trade agreement have been studied in Blanchard (2010). She shows that international ownership might mitigate the reasons why countries choose inefficient policies. This is among the first attempts to focus on policies about FDI barriers and multinational firms. International ownership leads governments to take into account the consequences of their policy on the foreign country in which their firms have invested. However this paper still focuses on tariffs rather than FDI barriers as our paper does. In our model the level of repatriation of profits at home covers the different types of international ownership. No repatriation of profit from the affiliates illustrates the multinational case whereas a full repatriation of profits models FDI.

A last contribution of the paper is to model a political bargaining between three players: the government and the national and foreign lobbies. Bargaining with more than two players is more difficult to model. Maggi and Rodriguez-Clare (1998) only models a two-player game between the government and one lobby. We use the concept of "coalition bargaining equilibrium" from Compte and Jehiel (2010) and study the possible outcomes depending on which coalition emerge from the game. This coalitional approach has not been used to study competition between lobbies.

3 Empirical motivation

3.1 FDI restrictions across countries and across sectors.

In a first part It is interesting to document the existence of barriers to FDI. We use the OECD index called "FDI Regulatory Restrictiveness Index" which is built on the following main types of FDI restrictions:

- Foreign equity limitations

- Screening or approval mechanisms

- Restrictions on the employment of foreigners as key personnel

- Operational restrictions, e.g. restrictions on branching and on capital repatriation or on land ownership

When the index is 0, there are no restrictions to foreign entry. The table 1 shows aggregated index for a subsample of OECD and non-OECD countries.

Sector / Industry	Primary	Manufacturing	Tertiary	Total FDI Index
OECD countries				
Australia	0.078	0.075	0.178	0.127
Canada	0.198	0.11	0.204	0.173
Chile	0.15	0	0.06	0.057
France	0.155	0	0.033	0.045
Germany	0.069	0	0.022	0.023
Israel	0.06	0.02	0.134	0.118
Italy	0.13	0	0.057	0.052
Japan	0.069	0.002	0.077	0.052
Korea	0.25	0	0.141	0.135
Mexico	0.394	0.103	0.206	0.207
United Kingdom	0.16	0.023	0.05	0.061
United States	0.181	0	0.094	0.089
OECD - Average	0.1	0.02	0.085	0.069
Non-OECD countries				
Argentina	0.075	0	0.049	0.038
Brazil	0.188	0.025	0.118	0.101
China (P. R. of)	0.456	0.236	0.484	0.418
India	0.405	0.046	0.34	0.263
Indonesia	0.426	0.067	0.466	0.34
Russia	0.157	0.095	0.255	0.181
Saudi Arabia	0.585	0.17	0.363	0.342
South Africa	0.01	0.01	0.101	0.055

Table 1: FDI restrictions in 2014 (OECD index)

Observation 1 *Entry rules restrict FDI across countries and across sectors. These entry barriers are often higher in the primary and tertiary sectors.*

In annex the same table for the OECD index in 1997 shows that FDI restrictions have been decreasing since 1997 but remain higher than tariffs that regulate imports and exports of goods.

In this paper we mainly focus on horizontal FDI.

3.2   The case of trade in services

Restrictions in the services sector represent a good example of horizontal FDI barriers. Whereas trade in manufacturing has surged in the last decades, the share of trade in services with respect to the size of the services sector in the GDP remains very low. One reason is that horizontal FDI is the main mode of trade for services. Many services can only be provided in the host country through commercial presence and can't be exported. Their trade is therefore not subject to tariffs but to foreign entry restrictions.

The following quotes illustrate the need to understand FDI restrictions, especially for services, and the extent to which services and FDI restrictions are a major topic of interest.

"A new round of global trade liberalization focused on services could touch off a new wave of globalisation. [...] But trade in services remains highly restricted. A club of mostly rich countries has made efforts to negotiate a Trade in Services Agreement to update an accord reached in 1995. But there has been little progress." *The Economist, 09/2014*

"The [TIPP,TPP] agreements would clear the way for freer trade in services, which account for most of rich countries' GDP but only a small share of trade. Opening up trade in services could help reduce the cost of everything from shipping to banking, education and health care." *The Economist, 02/2014*

In order to quantify FDI restrictions, the OECD developed an FDI index that covers all sectors and the World Bank recently has built another restrictiveness index especially for services, the Services Trade Restrictiveness Index (STRI).

The first figure 1 shows that horizontal FDIs is crucial for services. Commercial presence is the main mode of services exports and imports. In addition commercial presence in services sector has been growing over the last years. Given the share of services in developed economies, barriers on trade in services is a relevant topic for countries in order to boost their trade.
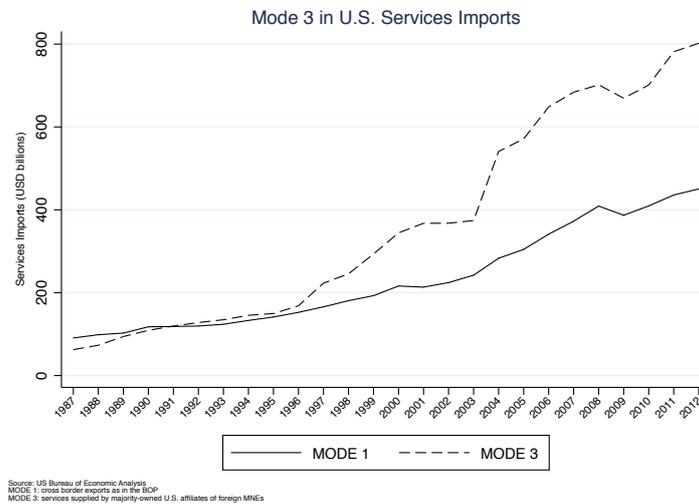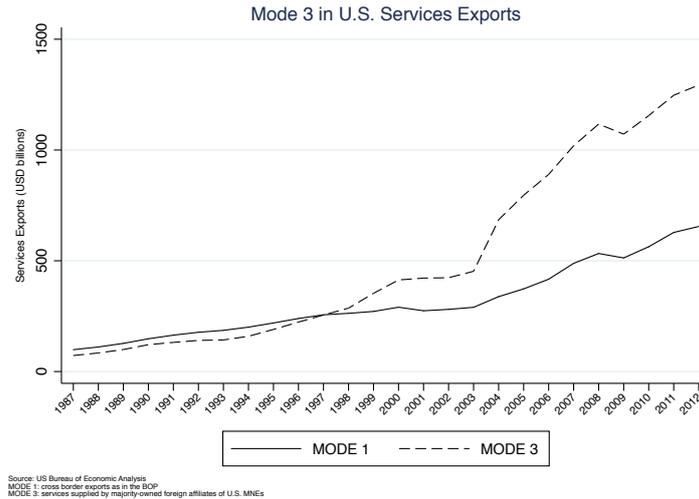
Figure 1: Commercial presence (mode 3) is the major mode of services exports and imports in the US.

The following figure 2 shows the large diversity in barriers to FDI across industries in the services sector and across countries. We can observe that some sectors are very restricted (real estate investment, media, maritime) whereas others are mostly not restricted (hotels and restaurants, wholesale, architectural). In addition restrictions vary across countries. Canada, the USA and Germany have on average low restrictions to foreign entry whereas China, India and Indonesia still have restrictive policies in most of the services sectors.
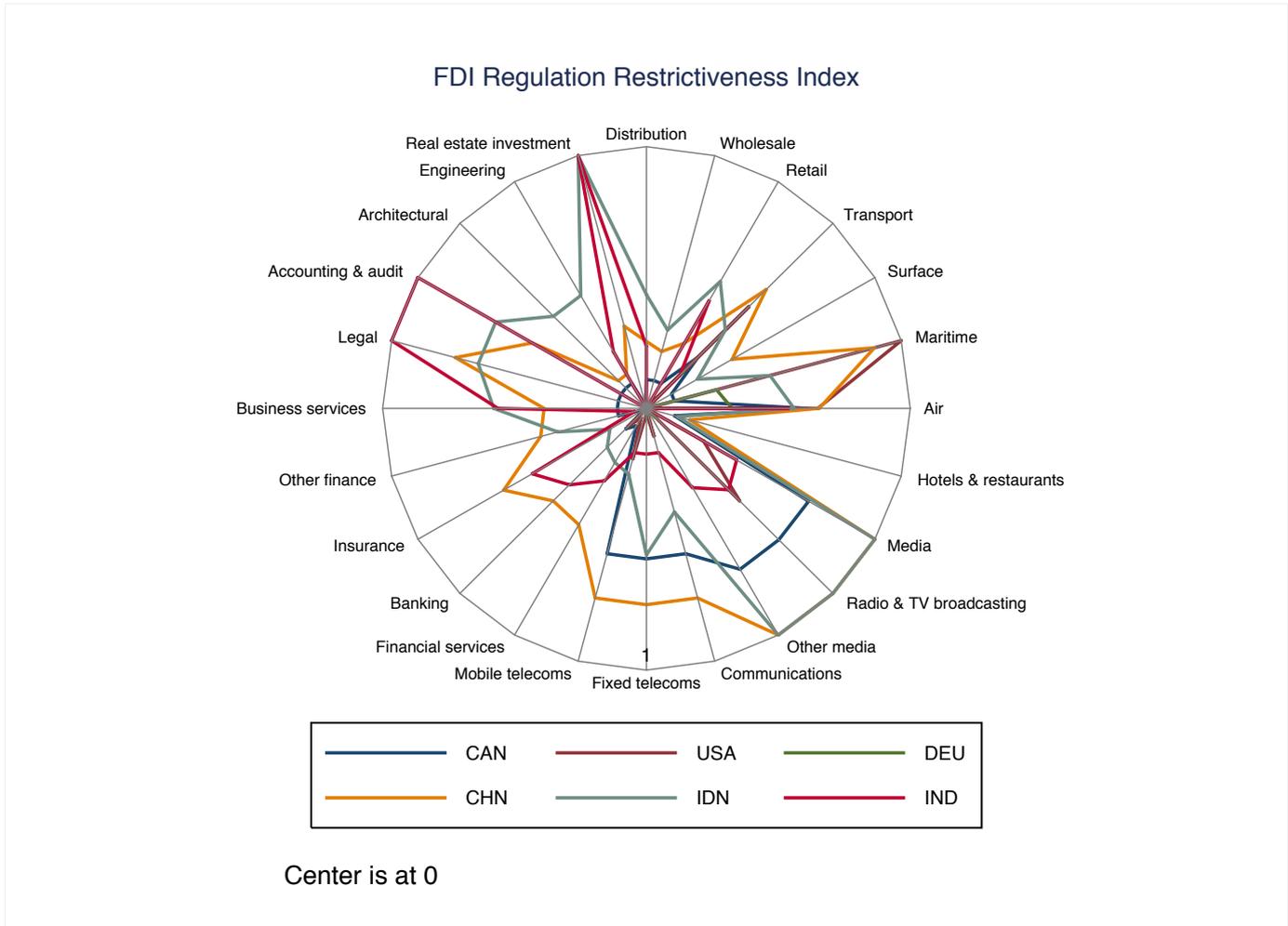
Figure 2: Barriers to FDI per sector and per country for services. Source of the data: OECD

Another source of data for FDI restrictions on services comes form the World Bank. Similar results appear on this figure 3. Restrictions vary a lot across sectors and across geographic zones.
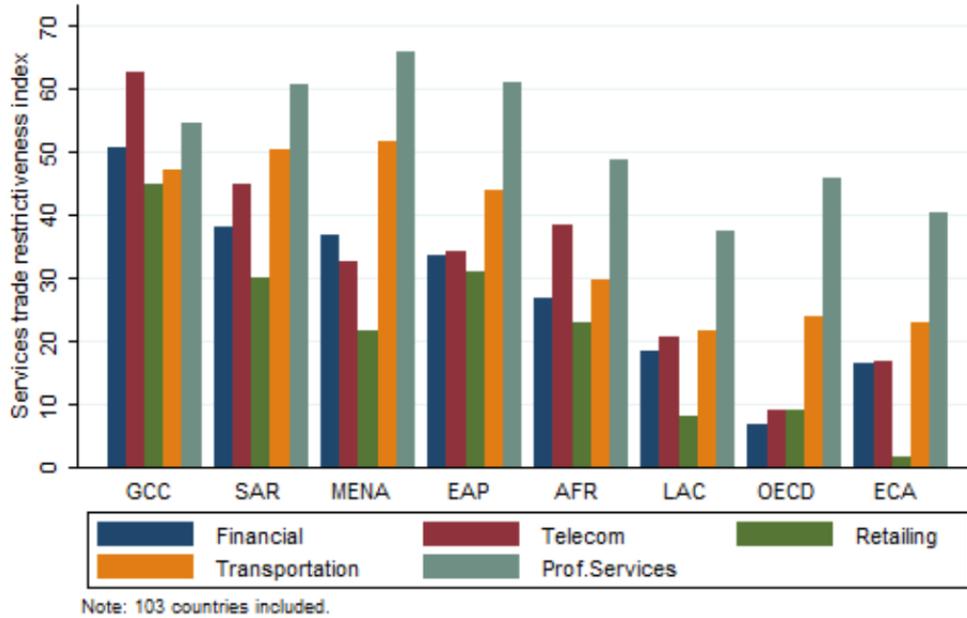
Figure 3: Services trade restrictiveness index by sector and region. Source: Borchert et al. (2012)

Observation 2 *Trade in services is restricted through FDI barriers. Restrictions on foreign entry vary a lot across sectors and across countries.*

The following figure 4 shows the level of restrictions in the two main rounds of negotiations overs services and the current level of restrictiveness. The GATS negotiations process does not seem to be very efficient given that most services liberalization has been undertaken unilaterally. In addition not all services sectors are being negotiated. Services seem to be a sector in which trade negotiations are difficult. One possible explanation is that trade in services is done through commercial presence.
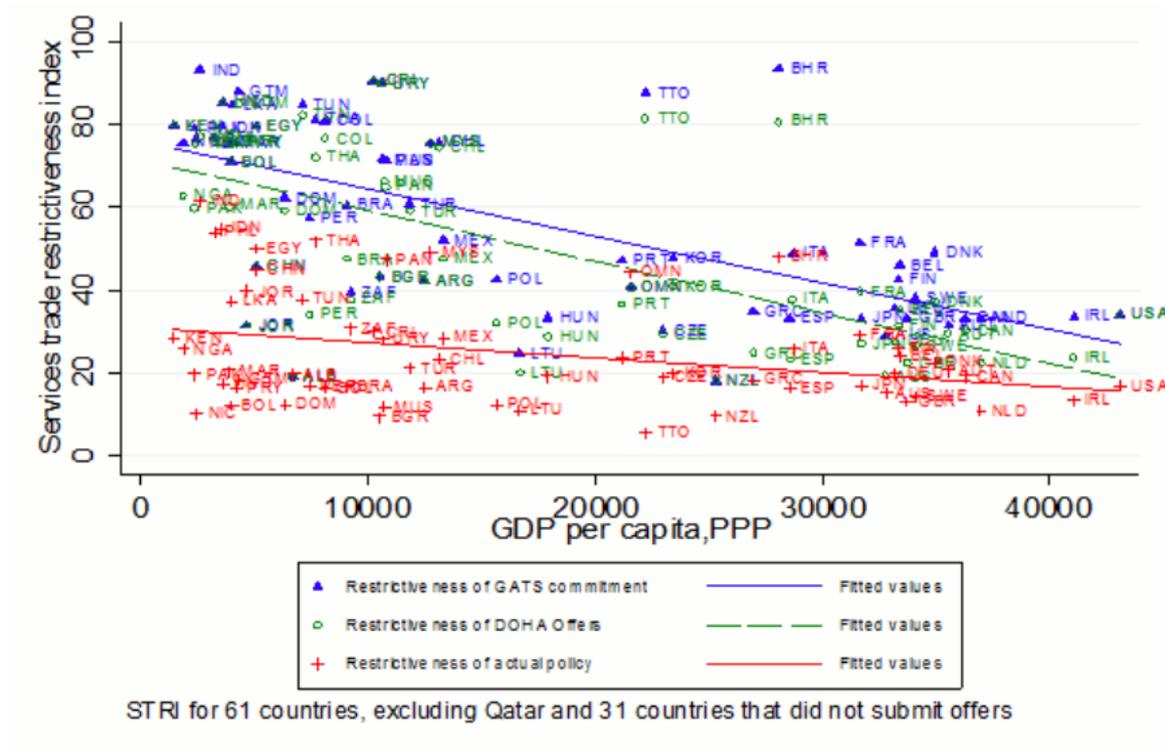
Figure 4: Uruguay round commitments, Doha offers and actual policy. Source: Borchert et al. (2011).

Observation 3 *Commitments on services trade restrictions through multilateral agreements (GATS, Doha) are weak but the restrictions from actual policies are lower than these commitments. Are multilateral agreements necessary?*

4 The model

We consider two countries, Home and Foreign (*). The countries have symmetric economic and political structures. We first describe in detail the economic and political system in country Home.

4.1 The economic structure

The demand

In each country, we consider a representative consumer, one homogenous good and a numeraire. The demand functions are taken to be identical across countries. We assume a representative consumer that consume the domestically-produced honogenous good and a numeraire [3] that represents the rest of the production. The consumer's utility is given by:

$$\mathbb{U}(x_0, X) = x_0 + u(X) \quad \text{st. } x_0 + PX \leq R$$

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[3]The numeraire is produced with constant returns to scale with a cost per unit of one which implies that its price is equal to one.

with x_0 the consumption of the numeraire, X the consumption of the other good and R the revenue given by the rents from the production sector. The demand is a function of price and is assumed to be strictly decreasing and twice continuously differentiable. We assume that the utility u is quasi-linear. This implies that the demand for the good only depends on the price, not on the revenue.

The demand of the representative consumer for the homogenous good at a price P is

$$D(P) \quad \text{and} \quad D'(P) < 0$$

The demand is assumed to be strictly decreasing and twice continuously differentiable. The consumer surplus is $H(P)$ and $H'(P) \leq 0$.

The production

We focus on the production of the homogenous good. In this paper we study horizontal FDI so national and foreign affiliates can both produce the good at Home. Foreign firms do not export but are allowed to trade through affiliates. All firms are assumed to be born in a certain country and can start horizontal FDI by opening a foreign affiliate in the other country. A foreign affiliate allows the firm to produce in the host country and sell to its consumers only. Therefore Home firms can create affiliates in the Foreign country to sell to Foreign consumers, and Foreign firms can create affiliates in the Home country to sell to Home consumers.

In the Home economy there is a total mass M of firms that produce the homogenous good. All firms are assumed to be identical regarding their production capacity. We now differentiate firms according to their nationality, given by the country in which the firms are born. Among the total mass M of firms in country Home, a mass M_n are national firms and the rest $M_f = M - M_n$ are affiliates from Foreign firms. In the rest of the paper we focus on the short-term equilibrium and assume that the mass M_n of national firms is given at the beginning of the period and is not endogenous.

We assume short-term perfect competition[4], the price P of the homogenous good is taken as given by firms and there is no free-entry. The mass of firms is here only determined by the entry of foreign affiliates in the production process.

Each firm, either a national firm or a foreign affiliate, produces an individual quantity $q(P)$ and the total production is given by $Q(P) = M \times q(P)$. We assume decreasing returns to scale. Given that there is no free-entry, individual profits are not driven to zeros and are therefore positive $\pi \geq 0$. Each individual profit is decreasing in the price P.
The incentives of the firms to open an affiliate are not modelled. For simplicity it is also assumed that the cost of opening an affiliate is null and that the profit of the affiliate will be positive. The mass of affiliates that are open is then only determined by the government's policy in the next subsection.

The repatriation of profits

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[4]In another version of the paper we considered oligopolistic competition with firms behaving strategically to increase their profits. The addition of oligopolistic competition does not change the main ideas of the paper so we decided to simplify the model for short-term perfect competition.

In this model, we assume that part of the profits made by foreign affiliates are repatriated abroad. We denote by ϕ the share of the affiliates' profits which is repatriated ($0 \leq \phi \leq 1$). We have to distinguish between domestic activities and nationality of the firms. Firms born at Home produce at Home and earn domestic profits. In addition some of them create affiliates and earn profits that they partly repatriate at Home.

We then distinguish the following notations:

- The aggregate domestic profits of Home firms: $\Pi(M) = M_n\pi(M)$

- The aggregate profits of Home affiliates in the Foreign country: $\Pi^f(M^*) = (M^* - M_n^*)\pi^*(M^*)$

  The aggregate profit of Home firms:

$$\widetilde{\Pi}(M, M^*) = M_n\pi(M) + \phi(M^* - M_n^*)\pi^*(M^*)$$

  with ϕ the share of the affiliates' profits which is repatriated.

- The aggregate profits of Foreign affiliates in the Home country: $\Pi^{*f}(M) = (M - M_n)\pi(M)$

The trade policy

We assume that the only trade policy instrument of the government is a market access restriction in the production sector. The government chooses the final mass M of firms to restrict the entry of foreign producers that directly compete with national producers. More precisely, the government takes as given the mass of national firms M_n and sets a value for M which directly determines the mass of non-national suppliers allowed to produce in the country.

On this paper we introduce the possibility for lobbies to be formed and influence the choice of the government.

The lobbies

We assume that firms are able to coalesce in a lobby in order to affect the trade policy chosen by the government. For simplicity we assume that there are two lobbies in each country, the lobby of national firms ("the national lobby") and the lobby of foreign affiliates ("the foreign lobby"). Both lobbies can give contributions to the government at the time when the government chooses the trade policy, i.e the restrictions on the mass of foreign affiliates that can start producing in the country and compete with the national firms. The national and foreign lobbies have different objective functions.

National firms value protection again foreign entry at Home. Indeed a higher mass of total firms M producing at Home implies a lower price and therefore a lower profit for national firms at Home ($\frac{d\pi(M)}{dM} < 0$). The national lobby will give contributions in order to increase the restrictions on foreign entry and lower the choice of the final mass M.
The national lobby's objective is given by:

$$L(M, c) = M_n\pi(M) - c$$

On the contrary, foreign affiliates might value both less or more protection. Similarly to national firms' domestic profits, individual Foreign affiliates' profits decrease in the mass of total firms M. However the foreign lobby represents the sum of all foreign affiliates' profit and the aggregate profit might decrease in the mass of firms. The purpose of the foreign lobby is not straightforward and might push towards more or less protection. The foreign lobby's objective is given by:

$$L^f(M, c^f) = (M - M_n)\pi(M) - c^f$$

The government

The government chooses the trade policy, i.e. the mass of total firms, while playing a political game with the two lobbies. Both lobbies can give contributions to the government to affect his choice. The government differently values the domestic social welfare and the political contributions. An additional difference between national and foreign affiliates is introduced here. We assume a national preference, or aversion towards foreign influence, that is expressed by an adverse reaction towards foreign affiliates' expenditures to affect government's policies. We model this aversion by a punishment cost for the government that receives foreign contributions. Foreign contributions are publicized and punished with a probability $1 - \gamma$. For simplicity we assume a punishment cost proportional and equal to the foreign contributions. Given this structure of punishment the government always accepts to receive foreign contributions which only benefits him with a probability γ.[5]

When the government is not influenced by lobbies, his objective is given by:

$$W^\phi(M, M^*) = \underbrace{H(M)}_{\text{CS}} + \underbrace{\widetilde{\Pi}(M, M^*)}_{\text{national PS}} + \underbrace{(1 - \phi)\Pi^{*f}(M)}_{\text{foreign PS}}$$

with $\quad \widetilde{\Pi}(M, M^*) = \Pi(M) + \Pi^f(M^*) = M_n\pi(M) + \phi(M^* - M_n^*)\pi(M^*)$
$\quad\quad \Pi^{f*}(M) = (M - M_n)\pi(M)$

When the government accepts contributions from the lobbies, his objective is a weighted average of his previous social utility and of the contributions:

$$\mathbb{G}(M, M^*, c, c^f) = aW^\phi(M, M^*) + c + \gamma c^f$$

We assume that there is a difference between national and foreign contributions. γ is the probability for foreign contributions not to be punished by Home consumers, otherwise the cost of punishment is $-c^{f}$.[6]

In this model, there are two countries, Home and Foreign(*), that are symmetric. The previous description of the economic and political structures symmetrically applies for the Foreign country. We consider first the non-cooperative game between the two countries in which each country simultaneously decides his policy in a non-cooperative way. Second we consider the cooperative game in which the two countries can initially agree to commit to a policy through an agreement.

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[5]This is similar to the model of Gawande et al. (2006) in which foreign contributions are assumed to be less valued by the government. This undervaluation is empirically showed by Gawande et al. (2006).

[6]The full government's objective is the following: $\mathbb{G} = aW^\phi(M, M^*) + c + c^f + (1 - \gamma)(-c^f)$.

5 The non-cooperative world game

In this section, countries simultaneously decides their policy (M) in a non-cooperative way. This policy is decided through a domestic lobbying game. We describe here the domestic game in country Home. Given that the two countries are symmetric, the same takes place in country Foreign.

The timing There are two periods in this game. At the beginning, the mass of national firms born in each country (M_n) is fixed. At $t = 1$ the government chooses the trade policy, i.e the number of foreign affiliates that can enter the country, when playing the domestic political game with the two lobbies. At $t = 2$, given the total numbers of firms (M), production and consumption happen.

The equilibrium is solved by backward induction starting from the partial production/consumption equilibrium at $t = 2$. The part that needs to be more detailed is the domestic game between the government and the lobbies at the period $t = 1$.

5.1 The production/consumption equilibrium (t=2)

At $t = 2$, the number of producers has been chosen. Each producer maximises his profit.

The production/consumption equilibrium *Given the governments' policy M, the price $P(M)$ and the quantities are determined and verify the optimality conditions of the producers and consumers as well as the good market clearing condition.*

There are no exports between the two countries so the price only depends on the domestic policy. The good market is cleared given the domestic productions only $D(M) = Q(M)$.

5.2 The domestic lobbying game ($t = 1$): the grand coalition

At $t = 1$ the government and the two lobbies have the choice whether to play a bargaining game to determine the policy M or not. The lobbies can influence the choice of the government through contributions. In order to determine the best strategy of the government, we first consider the utilities in the two cases for any foreign policy M^*.

5.2.1 No political game

When there is no lobbying, the government does not receive any contributions and maximises his social welfare W.

Given the policy in the other country M^*, the solution with no lobbying and repatriation of profits M_0^ϕ is given by

$$M_0^\phi = \arg\max_{M} \quad W^\phi(M, M^*)$$

We can notice that M_0^ϕ does not depend on M^* because of the linearity of $W^\phi(M, M^*)$. Finally given the policy in the other country M^*, the utility of the government when not playing the political game is:

$$\mathbb{G}_0 = G(M_0^\phi, M^*) = aW(M_0^\phi, M^*) + 0$$

5.2.2 The bargaining game

In this part the government and the two lobbies can bargain to determine the policy. We assume that there is no cost of punishment for a government to accept foreign contributions such that $\gamma = 1$. Foreign and national contributions are valued in the same way. We relax this assumption in the last section.

Following Maggi and Rodriguez-Clare (1998)[7] we model the political game as a bargaining game between the government and the lobbies. Whereas it is easy to model a bargaining game between two players, a bargaining game between three players is more demanding. We then use the concept of "coalitional bargaining" developed in Compte and Jehiel (2010). This bargaining game can be applied to any number of players and is conceptually close to the bargaining game definition used for two players in the literature. The difference comes from the possibility for any subset of players to quit the grand coalition and form a sub-coalition. This possible outcome is similar to the outside option in a two-player game. The new equilibrium is the solution of the weighted Nash product given the constraints that a subset of players can form a sub-coalition. The additional constraints allow the grand coalition to be stable. We can already notice that the government which chooses the policy has to be in any sub-coalition. In addition we assume that only the government and one lobby can coordinate to form a sub-coalition. This means that the two lobbies cannot coordinate not to participate in the bargaining game. A coordinated deviation to quit the game is not possible. Therefore the outside option of each lobby is the solution of the sub-coalition game without their participation.

There are two sub coalitions that can be formed here: the national coalition between the government and the national lobby, and the foreign coalition between the government and the foreign lobby.

The coalitional bargaining solution *Given the policy in the other country M^*, the solutions of the bargaining game between the government and the two lobbies are given by:*

$$
\begin{aligned}
(M^C, c^C, c^{f,C}) &= \underset{(M,c,c^f) \in \mathbb{R}^{+3}}{\arg\max} \quad [G(M, M^*, c, c^f) - G_0]^{\sigma_G}[L(M, c) - \Pi(M^F)]^{\sigma_N}[L^f(M, c^f) - \Pi^{*f}(M^N)]^{\sigma_F} \\
&\quad st. \quad G(.) + L(.) \geq \mathbb{J}^{\mathbb{N}}(M^N, M^*) \quad \textit{(binding national sub-coalition)} \\
&\quad\quad\quad G(.) + L^f(.) \geq \mathbb{J}^{\mathbb{F}}(M^F, M^*) \quad \textit{(binding foreign sub-coalition)}
\end{aligned}
$$

with G_0 the outside option of the government and $\mathbb{J}^{\mathbb{N}}$, resp. $\mathbb{J}^{\mathbb{F}}$, the joint surplus of the national sub-coalition, resp. of the foreign sub-coalition. σ_G is the bargaining power of the government.

---

[7]There are two possibilities to model this political game: the menu-auction game or the bargaining game. They are relatively close and differ only in the way to divide the joint surplus between the different players. In the menu-auction game, the government always gets his outside option, whereas in the bargaining game he gets a share of the joint surplus that depends on his bargaining power.

The policy In the grand coalition with the government and the two lobbies, the solution of the Nash product is efficient and maximises the joint surplus.

$$M^C = \arg\max_M \quad \mathbb{J}^C(M, M^*)$$

with $\mathbb{J}^C(M, M^*)$ the joint surplus of the grand coalition given by

$$\mathbb{J}^C(M, M^*) = aW^\phi(M, M^*) + \Pi(M) + \Pi^{*f}(M)$$

The sub-coalitions The outside options are the games when not all three agents play the political bargaining game. The government and one of the two lobbies can choose not to play in the grand coalition, or one of the lobbies can choose unilaterally not to participate in the political game.

The following graph illustrates the cases for which one of the constraints might be binding. When the joint surplus in the national sub-coalition $\mathbb{J}^N$ is higher than the sum of the allocations of the government $G()$ and of the national lobby $L()$, there is a profitable deviation. The same happens for the foreign sub-coalition with the surplus $\mathbb{J}^F$.
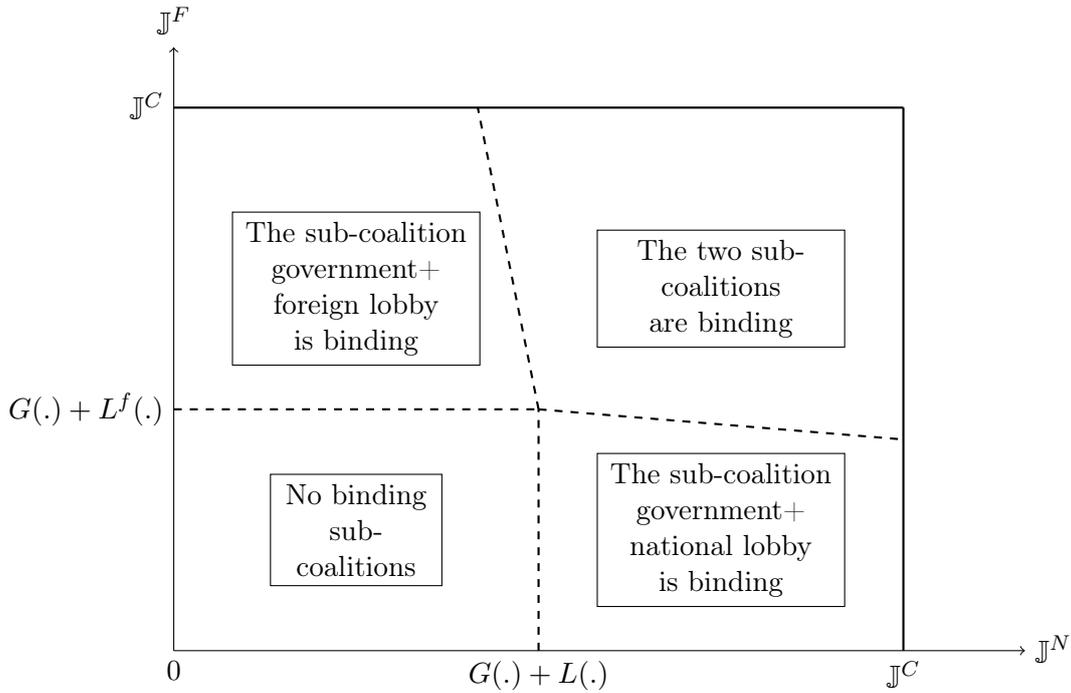

Figure 5: The four different cases depending on which sub-coalitions might be binding.

The outcomes of the two sub-coalitions are given by the following two propositions.

The national sub-coalition *When the government and the national lobby play a two-player bargaining game, the policy and the contribution solve the Nash product given the policy in the other country M^*.*

$$(M^N, c^N) = \arg\max_{(M,c)\in\mathbb{R}^{+2}} \quad [G(M, M^*, c) - G_0]^{\sigma_G}[L(M, c) - L_0]^{1-\sigma_G}$$

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with G_0 the outside option of the government, and L_0 the outside option of the national lobby.

The solution in the national sub-coalition maximises the joint surplus and is given by:

$$M^N = \arg\max_M \quad aW(M, M^*) + M_n\pi(M)$$

The surplus is $\qquad \mathbb{J}^{\mathbb{N}}(M^N, M^*) = aW(M^N, M^*) + M_n\pi(M^N)$

The foreign sub-coalition *When the government and the foreign lobby play a two-player bargaining game, the policy and the contribution solve the Nash product given the policy in the other country M^*.*

$$(M^F, c^{f,F}) = \arg\max_{(M,c^f)\in\mathbb{R}^{+2}} \quad [G(M, M^*, c^f) - G_0]^{\sigma_G}[L^f(M, c^f) - L_0^f]^{1-\sigma_G}$$

with G_0 the outside option of the government, and L_0^f the outside option of the foreign lobby.

The solution in the foreign sub-coalition maximises the joint surplus and is given by:

$$M^F = \arg\max_M \quad aW(M, M^*) + (M - M_n)\pi(M)$$

The surplus is $\qquad \mathbb{J}^{\mathbb{F}}(M^F, M^*) = aW(M^F, M^*) + (M^F - M_n)\pi(M^F).$

We can now compare the two policies chosen in the two sub-coalitions and the policy chosen in the grand coalition.

Remark 1 (Comparative statics) *We can show that (i) the policy chosen in the foreign sub-coalition (M^F) is always less restrictive than the policy chosen in the grand coalition ($M^C < M^F$), and that (ii) the policy chosen in the national sub-coalition (M^N) is more restrictive ($M^N < M^C$) when the extensive margin of the foreign lobby is higher and less restrictive ($M^C < M^N$) when its intensive margin is higher.*

The foreign lobby might either support more entry if he benefits more from an additional entry - the extensive margin is higher- or support less entry if he benefits more from a higher marginal individual profit - the intensive margin is higher-. The foreign lobby benefits from an additional entry if $-(M^C - M_n)\pi'(M^C) \leq \pi(M^C)$ and benefits from a higher marginal individual profit if $-(M^C - M_n)\pi'(M^C) \geq \pi(M^C)$.

5.2.3 The equilibrium of the non-cooperative world game

The previous parts describe the strategic choices in the Home country. The same strategy is chosen by the other country which is symmetric. In the two countries, the strategies of the non-cooperative world game are to play the grand coalition domestic game. The government plays the bargaining game given that he is always compensated by the lobbies for not choosing his outside option. We can now compute the final allocations in the non-cooperative world game given that each government always prefers to play the bargaining game with his lobbies. For the rest of the paper we focus on the particular case of a null government's bargaining power ($\sigma_G = 0$).

Proposition 1 (The non-cooperative world equilibrium) *The equilibrium policies in the non-cooperative world equilibrium are the solutions of the domestic grand coalition bargainings* (M^C, M^{C*}) *defined by*

$$M^C = \arg\max_M \quad aW^\phi(M, M^{C*}) + \Pi(M) + \Pi^{*f}(M)$$

$$M^{C*} = \arg\max_{M^*} \quad aW^{\phi*}(M^*, M^C) + \Pi^*(M^*) + \Pi^f(M^*)$$

The Home government's allocation is given by:

$$G = \begin{cases} aW^\phi(M_0^\phi, M_0^{\phi*}) & \text{if at most one sub-coalition is binding and } M^C < M_0^\phi \\ aW^\phi(M^C, M^{*C}) & \text{if at most one sub-coalition is binding and } M^C \geq M_0^\phi \\ \mathbb{J}^\mathbb{N} + \mathbb{J}^\mathbb{F} - \mathbb{J}^\mathbb{C} & \text{if the two sub-coalitions are binding.} \end{cases}$$

The Foreign government's allocation is symmetric.

This result differs from the literature on commitment that finds that a government always gets his outside option when he has no bargaining power. This is only happening in the first case when at most one sub-coalition is binding and the policy chosen in the grand coalition bargaining is more restrictive than the policy when there is no political game ($M^C < M_0^\phi$).

The interesting case is when the policy chosen in the grand coalition bargaining is less restrictive than the policy when there is no political game ($M^C \geq M_0^\phi$). This means that the foreign lobby pushes towards more entry compared to the no-lobby situation. Given that the government has no bargaining power, he will only be compensated for playing the lobbying game. However in the case of $M^C \geq M_0^\phi$, the final utility of the government without any contributions is higher than the final outside option $aW^\phi(M^C, M^{*C}) > aW^\phi(M_0^\phi, M_0^{\phi*}) = \mathcal{G}_0$. This is due to the fact that M_0^ϕ is chosen without considering the policy of the other country which itself affects the final utility of the government. A less restrictive policy (i.e. a higher number of firms) in the two countries increases the utility of the government which also benefits from the increasing entry for his firms' affiliates in the other country. At the equilibrium the government does not receive any contributions.

The last case of the government's allocation being higher than the outside option is when the two sub-coalitions are binding. The allocation is determined such that the two constraints are verified. It results in the following allocations for the three players:

$$\begin{cases} G(.) + L(.) & = \mathbb{J}^\mathbb{N} \\ G(.) + L^f(.) & = \mathbb{J}^\mathbb{F} \\ G(.) + L(.) + L^f(.) & = \mathbb{J}^\mathbb{C} \end{cases} \Leftrightarrow \begin{cases} G(.) & = \mathbb{J}^\mathbb{N} + \mathbb{J}^\mathbb{F} - \mathbb{J}^\mathbb{C} \\ L(.) & = \mathbb{J}^\mathbb{C} - \mathbb{J}^\mathbb{F} \\ L^f(.) & = \mathbb{J}^\mathbb{C} - \mathbb{J}^\mathbb{N} \end{cases}$$

with $\mathbb{J}^\mathbb{N}$ the joint surplus of the national sub-coalition, $\mathbb{J}^\mathbb{F}$ the joint surplus of the national sub-coalition, and $\mathbb{J}^\mathbb{C}$ the joint surplus of the grand coalition .

5.3 Comparative statics

We now focus on the case when at most one sub-coalition is binding. The government's allocation depends whether the policy chosen in the grand coalition bargaining (M^C) is more or less

restrictive than the policy chosen when there is no domestic bargaining game (M_0^ϕ).

In the previous part we showed that the solutions of the non-cooperative world equilibrium with no lobbying ($M_0^\phi, M_0^{\phi*}$) are given by:

$$M_0^\phi = \arg\max_M \quad W^\phi(M, M_0^{*\phi}) \quad \text{and} \quad M_0^{*\phi} = \arg\max_{M^*} \quad W^{\phi*}(M^*, M_0^\phi)$$

The following proposition highlights a particular case which is interesting regarding the policy when there is no repatriation of profits ($\phi = 0$) by the affiliates.

Proposition 2 (Free entry and no repatriation of profit) *When there is no repatriation of affiliates' profits ($\phi = 0$), the solutions of the non-cooperative equilibrium with no lobbying are given by free-entry in the two countries. The number of firms (M_0, M_0^*) is defined at the equilibrium such that the individual profits are null.*

$$M_0 \quad st. \quad \pi(M_0) = 0 \quad and \quad M_0 = \arg\max_M \quad W^0(M)$$

$$M_0^* \quad st. \quad \pi^*(M_0^*) = 0 \quad and \quad M_0^* = \arg\max_{M^*} \quad W^{0*}(M^*)$$

When there is a positive repatriation of affiliates' profits ($\phi > 0$), there are some restrictions to foreign entry barriers (free-entry is not allowed) even when there is no lobbying: $M_0^\phi \leq M_0$ and $M_0^{\phi*} \leq M_0^*$.

For example, when the aggregate foreign affiliates' profits increase in M ($\Pi^{f*\prime}(M_0^\phi) > 0$) we can show that foreign entry is strictly restricted ($M_0^\phi < M_0$) and free entry is not the solution (proof in annex).

Proposition 3 (Comparative statics) *We can show that the solution of the domestic grand coalition bargaining (M^C) is (i) lower -more restrictive- than the solution of the no-lobbying game (M_0^ϕ) when the marginal loss for all firms from more entry is larger than the gain from one additional firm, and is (ii) higher -less restrictive- than the solution of the no-lobbying game (M_0^ϕ) when the marginal loss for all firms from more entry is smaller than the gain from one additional firm.*

We can rewrite the previous proposition in such a way.

i If $-\Pi'(M^C) \geq \Pi^{f*\prime}(M^C) \Leftrightarrow M^C \pi'(M^C) + \pi(M^C) \leq 0$ then $M^C < M_0^\phi < M_0$

ii If $-\Pi'(M^C) \leq \Pi^{f*\prime}(M^C) \Leftrightarrow M^C \pi'(M^C) + \pi(M^C) \geq 0$ then $M_0^\phi < M^C < M_0$

In the first case, the loss of national profit is bigger than that gain of foreign profit. Or the marginal loss for all firms from more entry is bigger than the gain from one additional firm. Lobbying pushes the government to choose a more restrictive policy. In the second case the loss of national profit is smaller than that gain of foreign profit. Or the marginal loss for all firms from more entry is smaller than the gain from one additional firm. Lobbying pushes the government to choose a less restrictive policy.

6 The cooperative world game: the agreement

In this section, we introduce the possibility for countries to initially ($t = 0$) cooperate to choose their policies and commit through an agreement. An agreement allows the government to choose a policy that he would not choose by playing the non-cooperative game and tie his hands for the rest of the period. Taking into consideration that an agreement might be costly, it is only useful when it creates positive externalities. We assume that this agreement is perfectly enforceable such that there is no domestic political game any more at $t = 1$. In addition we assume that there is no ex-ante lobbying[8].

The timing There are three periods in this game. At the beginning, the mass of national firms born in each country (M_n) is fixed. At $t = 0$ governments can cooperatively choose the trade policies and commit by signing an agreement. At $t = 1$, if an agreement that determine policies is signed, commitment is perfect so there is no domestic political game between the government and the lobbies any more. At $t = 1$, if no agreement is signed, there is the domestic political game between the government and the lobbies as previously described. At $t = 2$, given the total numbers of firms (M), production and consumption happen.

The equilibrium is solved by backward induction starting from the partial production/consumption equilibrium at $t = 2$. The part that needs to be more detailed is the world game between the two governments at $t = 0$.

First the production/consumption equilibrium at $t = 2$ is the same as in the previous part. At $t = 1$ there is no domestic bargaining game when governments commit in the first stage.

6.1 The world cooperative game ($t = 0$)

We assume that the two symmetric countries play a cooperative bargaining game to choose the policies. The solutions are efficient and maximise the joint surplus.

Proposition 4 (The optimal trade agreement) *The optimal trade agreement is given by no restrictions on foreign entry (free-entry) in the two countries. The policies do not depend on the level of repatriation any more and are the same as the policies chosen in the non-cooperative world game when there is no repatriation of profits and no lobbying.*

An agreement allows the two governments to commit to a policy that does not only maximise the domestic activity like in the non-cooperative world game. The policies are chosen taking into consideration that the choice of one policy affects the utility of the other government through the repatriated profits of his affiliates. In the non-cooperative game governments choose their policy without taking these profits made in the other country into account. The two governments play simultaneously and cannot directly affect the choice of the policy abroad.

In addition the policy is the same as in the non-cooperative game when there is no repatriation because the government 's utility only depends on the profits of the foreign firms' affiliates. His firms do not repatriate any profits back so the previous problem disappears.

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[8]cf Maggi and Rodriguez-Clare (2007) for an example of ex-ante lobbying.

Proof

$$\arg\max_{(M,M^*)} \quad W^\phi(M,M^*) + W^{\phi*}(M^*,M)$$

$$= \quad \arg\max_{(M,M^*)} \quad W^0(M) + W^{0*}(M^*)$$

$$= \quad (M_0, M_0^*)$$

6.2   Costly agreement versus foreign lobbying

In this part we determine whether the government prefers to commit to an agreement or play the domestic political game. We keep considering the case of no bargaining power for the government. Other cases will lead to the previous results (Maggi and Rodriguez-Clare (1998) and Maggi and Rodriguez-Clare (2007)) that the government might prefer to play the domestic game when he gets enough contributions. Here we focus on no bargaining power for the rest of the part to be more clear.

We consider now that the agreement is costly. When there is no cost, the government always chooses to commit. The policies (M_0, M_0^*) are never chosen in the non-cooperative world game because individual profits are then driven to zero (free-entry condition).

Assumption : There is a cost K to sign an agreement which is low enough so that the government always wants to sign an agreement if there is no lobbying : $\mathbb{G}(M_0^\phi, M_0^{\phi*}) < \mathbb{G}(M_0, M_0^*) - K$.

The interesting case if when the non-cooperative solution in the grand coalition (M^C) is higher (less restrictive) than the solution with no lobbying (M_0^ϕ). Foreign lobbying decreases the level of restrictions -increases foreign entry- compared to the non-cooperative solution with no lobbying.

Proposition 5 *For two symmetric countries, the governments do not sign an agreement when foreign lobbying leads to higher foreign entry in both countries and makes an agreement too costly.*

$$M^C > M_0^\phi, \quad M^{*C} > M_0^{\phi*} \quad\quad and \quad\quad \mathbb{G}(M^C, M^{C*}, 0, 0) \geq \mathbb{G}(M_0, M_0^*, 0, 0) - K$$
$$M^{*C} > M_0^{\phi*}, \quad M^C > M_0^\phi \quad\quad and \quad\quad \mathbb{G}(M^C, M^{C*}, 0, 0) \geq \mathbb{G}(M_0, M_0^*, 0, 0) - K$$

What is interesting is that the government does not sign an agreement because he gets more contributions by playing the lobbying game. Compared to previous commitment models, the government does not prefer playing the political game because of the positive contributions he gets from the lobbies. Here the government does not receive any contributions (cf. assumption of no bargaining power). Foreign lobbying pushes the government to choose a lower level of restrictions (higher level of entry M) and finally to increase his objective in the world two-player game assuming countries are symmetric.

This proposition shows cases when a costly agreement is not the best solution. An agreement maximises the social welfare W but can waste a certain amount of resources K. In case of foreign

lobbying, playing the domestic bargaining game only might lead to a lower level of restrictions when the foreign lobby supports more entry than the agreement but avoids to waste the resources of the agreement cost.

This shows that foreign lobbying can be welfare-improving and decreases the externality in the world game. However foreign lobbying might not be discriminated compared to national lobbying, and this positive effect might disappear. In that case an agreement might remain the best solution. Thus in the next part we allow for extensions to study how the discrimination towards foreign lobbying and the introduction of taxes that affect the repatriation behaviour of firms might change the results.

7 Extensions

In this part we study two extensions: a cost for accepting foreign contributions and the choice of taxes that affect the repatriation behaviour of the firms. We consider these extensions given our previous results that foreign lobbying might replace a costly agreement. First we study whether differences between national and foreign influence might affect this result. Second we study whether adding for a government the possibility to affect the repatriation behaviour with taxes might also affect this result.

7.1 A positive cost of punishment for foreign lobbying ($\gamma < 1$).

In this section we consider a non-zero probability that foreign contributions are punished. This implies that the objective of the government when playing the domestic political game is:

$$\mathbb{G}(M, M^*, c, c^f) = aW^\phi(M, M^*) + c + \gamma c^f \quad \text{with} \quad \gamma < 1$$

This assumption has been widely used to model foreign lobbying (Gawande et al. (2006)). The parameter γ is the government's valuation of foreign contributions. When $\gamma < 1$ the government differently values national and foreign contributions. The same bargaining process takes place between the government and the two lobbies. We only focus on the domestic bargaining in the non-cooperative world game. Here is the domestic bargaining at $t = 1$ when contributions are differently valued ($\gamma < 1$).

7.1.1 The grand coalition

The coalitional bargaining solution Given the policy in the other country M^*,

$$
\begin{aligned}
(M_\gamma^C, c_\gamma^C, c_\gamma^{f,C}) \;=\; & \operatorname*{arg\,max}_{(M,c,c^f)\in\mathbb{R}^{+3}} \quad [G(M, M^*, c, c^f) - G_0]^{\sigma_G}[L(M,c) - \Pi(M_\gamma^F)]^{\sigma_N}[L^f(M,c^f) - \Pi^{*f}(M_\gamma^N)]^{\sigma_F} \\
& st. \quad G_\gamma(.) + L_\gamma(.) \geq \mathbb{J}^{\mathbb{N}}(M_\gamma^N, M^*) \quad \text{(binding national sub-coalition)} \\
& \qquad G_\gamma(.) + L_\gamma^f(.) \geq \mathbb{J}_\gamma^{\mathbb{F}}(M_\gamma^F, M^*) \quad \text{(binding foreign sub-coalition)} s
\end{aligned}
$$

with G_0 the outside option of the government and $\mathbb{J}^{\mathbb{N}}$, resp. $\mathbb{J}_\gamma^{\mathbb{F}}$, the joint surplus of the national sub-coalition, resp. of the foreign sub-coalition.

The policy In the grand coalition with the government and the two lobbies, the policy M_γ^C maximises $\mathbb{J}_\gamma^C(M)$ the joint surplus of the grand coalition given by

$$\mathbb{J}_\gamma^C(M, M^*) = aW(M, M^*) + (\gamma - 1)c^f + \Pi(M) + \Pi^{*f}(M)$$

Given the expression of the foreign contribution at the equilibrium, we can show that

$$M_\gamma^C = \operatorname*{arg\,max}_M \quad aW(M, M^*) + \Pi(M) + \gamma\Pi^{*f}(M)$$

First we can notice that $M_{\gamma=0}^C = M^N$ and $M_{\gamma=1}^C = M^C$.

Compared to the bargaining with $\gamma = 1$, the surplus that is shared between the three players is decreasing in foreign contributions. Only a percentage γ of what is given by the foreign lobby reaches the government's utility. Therefore there is a loss of surplus due to this difference in valuation. However the policy chosen in the bargaining process remain efficient and maximises the surplus given that this surplus decreases in the equilibrium level of foreign contributions. The main difference with a bargaining in which there is no such loss of surplus is explained in the next part.

Comparative statics When the foreign lobby benefits more from increasing the individual profits of the affiliates than from increasing the number of affiliates, we can show that the solution in the grand coalition bargaining is decreasing in the valuation of foreign contributions. When the government increasingly considers foreign interests, it chooses a more restrictive policy to increase individual profits.

$$-(M_\gamma^C - M_n)\pi'(M_\gamma^C) \geq \pi(M_\gamma^C) \quad \Rightarrow \quad \frac{\partial M_\gamma^C}{\partial \gamma} \leq 0$$

On the contrary when the foreign lobby benefits more from increasing the number of affiliate than from increasing individual profits, the solution in the grand coalition bargaining is decreasing in the valuation of foreign contributions. A governemnt that increasingly values foreign contributions chooses a less restrictive policy to increase foreign entry.

$$-(M_\gamma^C - M_n)\pi'(M_\gamma^C) \leq \pi(M_\gamma^C) \quad \Rightarrow \quad \frac{\partial M_\gamma^C}{\partial \gamma} \geq 0$$

7.1.2 Formation of sub-coalitions as an equilibrium

While sub coalitions never were the equilibrium formations in the previous sections for $\gamma = 1$, we can show that sub coalitions might now form.

Proposition 6 *Sub-coalitions between the government and one lobby only can be the equilibrium bargaining formation instead of the grand coalition with the three players when $\gamma < 1$.*
We can show that (i) the national sub coalition might form when the national sub-coalition constraint is binding in the grand coalition bargaining and the total surplus for the three players larger when only the government and the national lobby bargain:

$$G_\gamma(.) + L_\gamma(.) = \mathbb{J}^\mathbb{N}(M_\gamma^N, M^*) \quad and \quad \mathbb{J}^N(M^N) + \Pi^{*f}(M^N) \geq \mathbb{J}_\gamma^C(N_\gamma^C)$$

and that (ii) the foreign subcoalition might form when the foreign sub-coalition constraint is binding in the grand coalition bargaining and the total surplus for the three players larger when only the government and the foreign lobby bargain:

$$G_\gamma(.) + L_\gamma^f(.) = \mathbb{J}_\gamma^\mathbb{F}(M_\gamma^F, M^*) \quad and \quad \mathbb{J}_\gamma^F(M_\gamma^F) + \Pi(M_\gamma^F) \geq \mathbb{J}_\gamma^C(M_\gamma^C)$$

In order to show that the formation of sub-coalitions can be the equilibrium formations we have to show that the surplus for all three players can be larger in a sub-coalition formation than in the grand coalition. This was not the case in the previous section for $\gamma = 1$. The formation of sub-coalitions is possible given that the total surplus decreases in the foreign contribution with $\gamma < 1$.

The national bargaining solution Given the policy in the other country M^*,

$$(M_\gamma^N, c_\gamma^N) = \underset{(M,c)\in\mathbb{R}^{+2}}{\arg\max} \quad [G(M, M^*, c) - G_0]^{\sigma_G}[L^f(M, c) - L_0]^{1-\sigma_G}$$

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with G_0 the outside option of the government, and L_0 the outside option of the foreign lobby.

In the national sub-coalition with the government and the national lobby, the solution of the Nash product maximisation is efficient and maximises the joint surplus of the government and the national lobby given by $\mathbb{J}_\gamma^N(M) = aW^\phi(M, M^*) + M_n\pi(M)$. We can notice that $M_\gamma^N = M^N$ the foreign entry level in the sub-coalition when $\gamma = 1$.

Finally we can show that the total surplus for the three players when only the government and the foreign lobby play a political bargaining game is:

$$\mathbb{J}^N(M^N, M^*) + \Pi^{*f}(M^N) = aW(M^N, M^*) + \Pi(M^N) + \Pi^{*f}(M^N)$$

The parameter γ does not enter the joint suplus of the three players because there is no foreign contributions when only the government and the national lobby bargain.

$$\gamma < 1 \quad \Rightarrow \quad \mathbb{J}^N(M, M^*) + \Pi^{*f}(M) \neq \mathbb{J}_\gamma^C(M)$$

The foreign sub-coalition Given the policy in the other country M^*,

$$(M_\gamma^F, c_\gamma^{f,F}) \quad = \quad \underset{(M, c^f) \in \mathbb{R}^{+2}}{\arg\max} \quad [G(M, M^*, c^f) - G_0]^{\sigma_G}[L^f(M, c^f) - L_0^f]^{1-\sigma_G}$$

with G_0 the outside option of the government, and L_0^f the outside option of the foreign lobby.

In the foreign sub-coalition with the government and the foreign lobby, the solution of the Nash product maximisation is efficient and maximises the joint surplus of the government and the foreign lobby given by $\mathbb{J}_\gamma^F(M) = aW^\phi(M, M^*) + (\gamma - 1)c^f + (M - M_n)\pi(M)$. At the equilibrium, given the expression of the foreign contribution, we have

$$M_\gamma^F \quad \text{st.} \quad aW^{\phi'}(M_\gamma^F, M^*) + \gamma(M_\gamma^F - M_n)\pi'(M_\gamma^F) = 0$$

Finally we can show in annex that the total surplus for the three players when the government and the foreign lobby play the political bargaining game is:

$$\mathbb{J}_\gamma^F(M_\gamma^F, M^*) + \Pi(M_\gamma^F) = \frac{1}{\gamma(1 - \sigma_G) + \sigma_G}[aW(M_\gamma^F, M^*) + \gamma\Pi^{*f}(M_\gamma^F)] + \Pi(M_\gamma^F) + cte$$

The formation of the foreign sub-coalition is possible because the surplus that is negotiated in the two games is not the same when $\gamma < 1$. The size of the surplus to be shared depends on the contribution that is defined to maximize the Nash product.

$$\gamma < 1 \quad \Rightarrow \quad \mathbb{J}_\gamma^F(M) + \Pi(M) \neq \mathbb{J}_\gamma^C(M)$$

Proposition 7 (Agreements versus foreign lobbying with $\gamma < 1$) *When foreign contributions are punished ($\gamma < 1$), we can show that (i) the government is more likely to sign an agreement as foreign interests are less valued in the grand coalition and that (ii) it is however more likely that the government does not sign an agreement when the foreign sub-coalition is formed as only foreign interests are valued by the government.*

We can summarize the previous results by the following:

$$M = \begin{cases} M_\gamma^C & \text{if the grand coalition is formed,} \\ M^N & \text{if the national sub-coalition is formed,} \quad \text{and } M^N <> M_\gamma^C \\ M^F & \text{if the foreign sub-coalition is formed,} \quad \text{and } M_\gamma^F > M_\gamma^C \end{cases}$$

The comparison of the three possible outcomes is the same as in the case of $\gamma = 1$.

7.2   Taxation and entry restrictions

In a last section we consider the possibility that the repatriation of profits parameter is endogenous and depends on the tax rate applied on profits. We now allow the government to choose a tax rate that affects the behaviour of firms that repatriate their profits. In the previous part we proved that in case of no foreign lobbying the policy chosen by the government is not the efficient one when there exists a strictly positive repatriation of profits. In this section we study whether introducing a tax choice might change the following result and how it affects the need for governments to commit to an investment agreement versus a tax agreement. In this part we do not model any political game and the government does not receive any contributions.

The repatriation of profits is now endogenous. Firms choose how much of their profits made by their affiliates is brought back in their country of origin. In this paper we do not model in details the behaviour of the firms.
We assume that firms would prefer to repatriate all their profits in their home country but if the tax rate on profits is too high, they prefer to reinvest their profits abroad. Therefore even when the tax rate is the same in the two countries, firms choose not to repatriate all their profits and reinvest the rest of the non-repatriated profits in the foreign country.

We now have:
$$\phi(\tau, \tau^*) \text{ such that } \phi_\tau < 0 \text{ and } \phi_{\tau^*} > 0$$
$$\phi^*(\tau^*, \tau) \text{ such that } \phi^*_{\tau^*} < 0 \text{ and } \phi^*_\tau > 0$$

To simplify the part, we focus on the world non-cooperative game between the two countries. There is no domestic bargaining game. The government decides the policy by maximizing the social welfare only.

The new timing is the following. First the government can choose a tax rate on profits before choosing his trade policy. The choice of the tax rate determines the repatriation behaviour of the firms. Given the repatriation of profits the government then chooses his trade policy which is the number of foreign affiliates that are allowed to enter the country.

We assume that the non-cooperative world game is a two-stage game. At each stage governments choose simultaneously their policy. After the first stage, all agents know the tax rates that were chosen. Given these two tax rates, the second stage can happen when governments simultaneously choose their trade policies.

We study here two different taxes. The first tax is a tax on national revenues. All revenues from the firms that are received by national individuals are taxed. The second tax is a tax on domestic activities. All profits made in the country from national or foreign firms are taxed.

7.2.1   Taxation of national revenues

First we study a tax on national revenues which are the domestic profits of national firms, the repatriated profits of national firms' affiliates abroad, and of the non-repatriated profits of foreign affiliates. The profits differ here from the national revenues due to the repatriation behavior.

National firms' affiliates do not fully repatriate their profits home and foreign affiliates do not send all their domestic profits abroad.

The objective of the government is

$$
\begin{aligned}
\mathcal{G}(M, M^*, \tau, \tau^*) &= W(M, M^*, \tau, \tau^*) + \tau[\Pi(M) + \phi(\tau, \tau^*)\Pi^f(M^*) + (1 - \phi^*(\tau^*, \tau))\Pi^{*f}(M^*)] \\
&= H(M) + \Pi(M) + (1 - \phi^*(\tau^*, \tau))\Pi^{f*}(M) + \phi(\tau, \tau^*)\Pi^f(M^*)
\end{aligned}
$$

We solve the equilibrium by backward induction in the two-stage game. The second stage which is the choice of the policy has already been solved in the previous sections. We can now solve the first stage when governments the tax rates. In the first stage the government chooses the tax rate τ on profits such that

$$
-\phi_\tau^*(\tau^*, \tau)\Pi^{f*}(M) + \phi_\tau(\tau, \tau^*)\Pi^f(M^*) + \phi(\tau, \tau^*)\Pi^{f'}(M^*)\frac{\partial M^*}{\partial \tau} = 0
$$

Given our assumptions on the repatriation behaviour and results of the second stage when M and M^* are chosen,

$$
\frac{\partial M^*}{\partial \tau} = \underbrace{\frac{\partial M^*}{\partial \phi^*}\frac{\partial \phi^*}{\partial \tau}}_{=0} + \underbrace{\frac{\partial M^*}{\partial \phi}}_{\leq 0}\underbrace{\frac{\partial \phi}{\partial \tau}}_{\leq 0} \geq 0
$$

The taxes on national revenues are assumed to be perfectly redistributed to consumers. The government can choose to affect the repatriation behaviour. The first part of the equation implies that the government wants to decrease the tax rate in order to increase the repatriated profits of his affiliates that are abroad and decrease the repatriation of the foreign affiliates that are at home. This creates a race to the bottom for governments that lower their tax rates in order to keep more affiliates' profits. However given that the tax rate is chosen in the first stage, the government also takes into account that choosing a low tax rate to attract more of his affiliates' profits abroad will incentivize the other government to lower foreign entry. This directly affects the profits of his affiliates. Therefore if his firms want to enter more in the other country the government might choose not to lower too much his tax rate.

7.2.2 Taxation on domestic activity

In this second part we study a tax on all domestic profits which are the profits made by national firms and the profits made by the foreign affiliates. This tax does not consider the repatriation of profits. The tax applies to all profits made in a country.

The objective of the government is

$$
\begin{aligned}
\mathcal{G}(M, M^*, \tau, \tau^*) &= W(M, M^*, \tau, \tau^*) + \tau[\Pi(M) + \Pi^{*f}(M)] \\
&= H(M) + \Pi(M) + [\tau + (1 - \tau)(1 - \phi^*(\tau^*, \tau))]\Pi^{f*}(M) + \phi(\tau, \tau^*)(1 - \tau^*)\Pi^f(M^*)
\end{aligned}
$$

In the first stage the government chooses the tax rate τ on profits such that

$$
\begin{aligned}
&- (1 - \tau)\phi_\tau^*(\tau^*, \tau)\Pi^{*f}(M) + \phi_\tau(\tau, \tau^*)(1 - \tau^*)\Pi^f(M^*) \\
&+ \phi^*(\tau^*, \tau)\Pi^{*f}(M) + \phi(\tau, \tau^*)(1 - \tau^*)\Pi^{f'}(M^*)\frac{\partial M^*}{\partial \tau} = 0
\end{aligned}
$$

The reasoning is similar except that what is taxed is not what is received by the consumers. Therefore the government might value a tax rate especially when most of foreign affiliates' profit is repatriated abroad. Taxing activities whose profits benefit foreign consumers benefit the consumers. In this case the government will choose a higher tax rate than in the previous case.

Remark 2 *The two equilibrium tax rates are equal given that the two countries are symmetric and have the same strategy. However assuming that affiliates favour repatriation of their profits home for a same tax rate in the two countries, the repatriation of profits us higher and foreign entry is more restricted when national revenues rather than domestic profits are taxed.*

The tax rates when national revenues are taxed rather than domestic profits are lower. Given our assumption, profits will be more repatriated and foreign entry more restricted. When domestic profits are taxed, the government also benefits from taxing profits that will be repatriated abroad after taxation and do not benefit his consumers.

8 Empirical part

In this part we want to test whether the repatriation of profits from foreign affiliates might affect the choice of foreign entry restrictions. The main problem to give empirical evidence of the mechanism in the paper is the lack of data.

The dependent variable is the level of restrictions in a country for a particular sector in a particular year. We use the FDI Regulatory Restrictiveness Index (FDI Index) from the OECD. This index measures restrictions on FDI in 58 countries, covers 22 sectors and is available for 8 years: 1997, 2003, 2006-2014. The OECD lists the main types of restrictions that the index covers: foreign equity limitations, screening or approval mechanisms, restrictions on the employment of foreigners and operational restrictions. We observe some variance across sectors and across countries. The index is between 0 and 1, with high values for high restrictions.
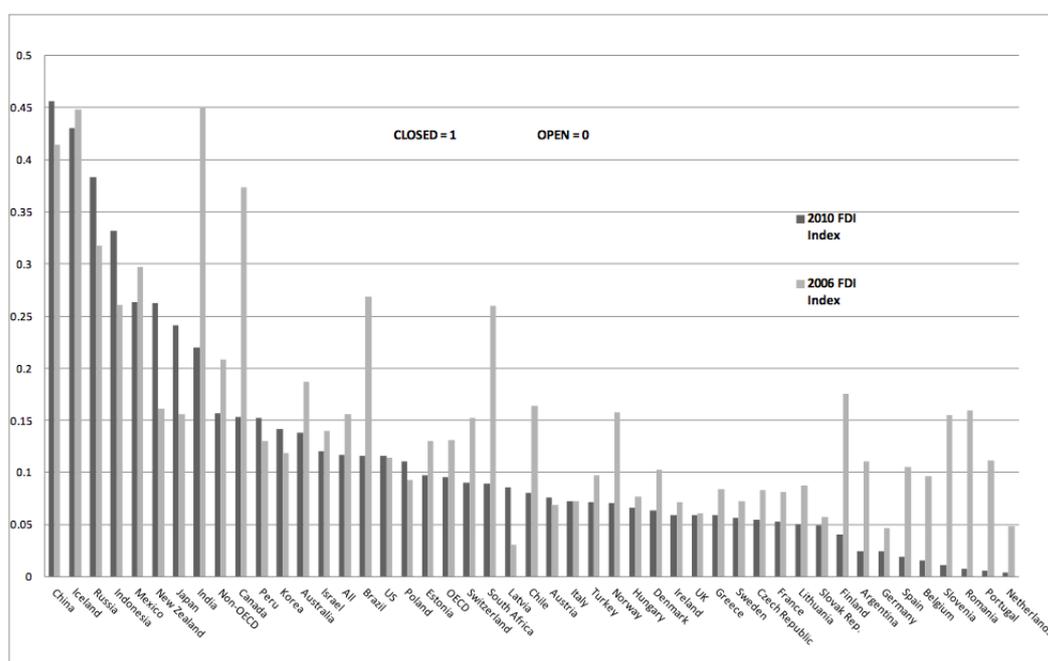

Figure 6: FDI restrictions vary a lot across countries and years (Source: OECD).

The main problem of this exercice was to find data on profits' repatriation at a country level for different sector at different years. Given the lack of data, the best solution is to build an instrument or a proxy that could be correlated to the repatriation of profits without causing FDI restrictions.[9] The literature suggests three determinants to explain the repatriation of profits by multinationals. First the difference in corporate taxes and the existence of bilateral treaties on double taxation is the fiscal determinant of repatriation of profits. The second determinant are the growth opportunities in the host country that could explain why profits is not repatriated but rather reinvested in the host country. A last determinant is the existence of tax heavens whose consequences are well described by G. Zucman in Zucman (2014).

---

[9] Overesch and DreÃler (2011), Hanlon et al. (2014), Zucman (2014)

In this empirical exercice we only consider the first two determinants as being instruments for the repatriation of profits.

The proxy for the repatriation of profits There is no good large database about decisions of multinational firms to repatriate their profits across countries and years.

I use here two proxy that I theoretically assume to be correlated with the repatriation of profits but that do not cause the dependent variable.

1. The tax proxy: the difference between the corporate tax rate in a country and a world corporate tax index. The world index is built as a weighted average of all countries' corporate tax rates with the outward FDI position of each country.

$$\mathbb{I}_{\tau,i} = \tau_i - \tau^W \quad \text{with} \quad \tau^W = \frac{\sum_{j \in W} \tau_j FDI_j^{out}}{\sum_{j \in W} FDI_j^{out}}$$

   Repatriation of profits is assumed to be increasing in the tax proxy. The higher the corporate tax compared to a world average, the more profits are repatriated home.

$$\text{Corr}(\phi, \mathbb{I}_{\tau,i}) \geq 0$$

2. The opportunity growth proxy: the difference between the growth rate of a country and a world growth rate index. The world index is built as a weighted average of all countries' annual growth rate with the GDP of each country.

$$\mathbb{I}_{g,i} = g_i - g^W \quad \text{with} \quad g^W = \frac{\sum_{j \in W} g_j GDP_j}{\sum_{j \in W} GDP_j}$$

   Repatriation of profits is assumed to be decreasing in the opportunity growth index. The higher the growth rate compared to a world average, the more profits remain in the country to be reinvested.

$$\text{Corr}(\phi, \mathbb{I}_{g,i}) \leq 0$$

We argue that this two proxy are good instruments. Their correlation with the independent variable cannot be checked but we use the economics literature to assume it. In addition we use lagged values for each proxy in order to reduce the problem of causality between the instrument and the dependent variable.

The regression Given the large number of other variables that can explain FDI restrictions, we use a fixed-effect models with fixed effects for countries, for years and for sectors. This aims at controlling all the possible unobserved factors that could explain FDI restrictions. We regress the FDI index using the two proxy and have significant results.

The data seem to support the mechanism that is at stake in this paper. Indeed the coefficient for the tax index is significant and positive. Given that the tax index is assumed to be positively correlated to the repatriation of profits, a higher repatriation of profits increases the level of restrictions. The second proxy is the growth index. The coefficient is significant and negative. Given that the tax index is assumed to be negatively correlated to the repatriation of profits, a

Table 2: Impact of repatriation on FDI restrictions

	OLS with FE	OLS with FE
TaxIndex	0.00381**	
	[0.00158]	
GrowthIndex		-0.0795*
		[0.0439]
Observations	945	951
Country FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
R-sq	0.395	0.392

Standard errors in brackets

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

higher repatriation of profits also increases the level of restrictions.

This is a first exercice to find empirical evidence to explain the determinants of FDI restrictions. The lack of large databases is a barrier to go further in this analysis.

9 Conclusion

In this paper we develop a new model in which governments regulate the entry of foreign affiliates that want to compete with national producers. National firms and foreign affiliates can form lobbies to lower or reinforce these restrictions. Affiliates can repatriate part of their profits in their country of origin. First we show that entry restrictions are chosen to prevent foreign affiliates from decreasing national firms' profits while repatriating their profits abroad. Second we show that in a coalitional bargaining model, the government might prefer avoiding costly negotiations for an agreement if foreign lobbying sufficiently lowers the restrictions. Agreement negotiations are however more likely when the government might be punished for accepting foreign contributions, except if a sub-coalition between the government and the foreign lobby is formed. Considering the impact of taxes in the repatriation behaviour, we show that foreign entry is more restricted when national revenues rather than domestic profits are taxed. Finally we use two proxies for the repatriation behaviour to provide empirical evidence that profits' repatriation affects the choice of FDI restrictions.

A lot of additional work is needed to understand the motives of FDI restrictions and the role of multilateral agreements in lowering these restrictions. More work should be done on the role of the repatriation of profits by multinationals and the impact of tax heavens on trade and domestic policies that regulate FDI.

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10 Proofs

10.1 Grand coalition

10.1.1 Proposition 5.2.2 : The coalitional bargaining solution:

Proof The combination of the FOCs of the Nash product to find M, c and c^f gives:

$$M^C \text{ st. } aW^{\phi'}(M^C, M^*) + \Pi'(M^C) + \Pi^{*f'}(M^C) = 0$$

Proof Existence and stability of such an equilibrium in the grand coalition.
A sub coalition is never the equilibrium formation because the solution of the Nash product M^C is efficient and maximises the joint surplus. The joint surplus in the grand coalition is always higher than with any other possible sub-coalitions. There exists some allocations not to deviate to the national sub-coalition or to the foreign sub-coalition. By definition of the joint surplus and its efficient redistribution:

$$\forall M^*, \quad \mathbb{J}^C(M^C, M^*) = G(.) + L(.) + L^f(.)$$

By definition of M^C:

$$
\begin{aligned}
aW(M^N, M^*) + \Pi(M^N) + \Pi^{*f}(M^N) &\leq aW(M^C, M^*) + \Pi(M^C) + \Pi^{*f}(M^C) \\
\Rightarrow \quad \mathbb{J}^{\mathbb{N}}(M^N, M^*) + \Pi^{*f}(M^N) &\leq \mathbb{J}^C(M^C, M^*)
\end{aligned}
$$

$$
\begin{aligned}
aW(M^F, M^*) + \Pi(M^F) + \Pi^{*f}(M^F) &\leq aW(M^C, M^*) + \Pi(M^C) + \Pi^{*f}(M^C) \\
\Rightarrow \quad \mathbb{J}^{\mathbb{F}}(M^F, M^*) + \Pi(M^F) &\leq \mathbb{J}^C(M^C, M^*)
\end{aligned}
$$

10.1.2 Proof of remark 1

Proof $M^N <> M^C$

$$aW^{\phi'}(M^N, M^*) + M_n \pi'(M^N) = 0$$
$$\text{and} \quad aW^{\phi'}(M^C, M^*) + M_n \pi'(M^C) = -(M^C - M_n)\pi'(M^C) - \pi(M^C)$$

case 1 If the intensive margin of the foreign lobby is higher : $-(M^C - M_n)\pi'(M^C) \geq \pi(M^C)$
$$\Rightarrow \quad aW^{\phi'}(M^F, M^*) + M_n \pi'(M^C) \geq aW^{\phi'}(M^C, M^*) + M_n \pi'(M^N)$$
$$\Rightarrow \quad M^N \geq M^C \quad M^C \text{ is more restrictive}$$

case 2 If the extensive margin of the foreign lobby is higher : $-(M^C - M_n)\pi'(M^C) \leq \pi(M^C)$
$$\text{then} \quad aW^{\phi'}(M^F, M^*) + M_n \pi'(M^C) \leq aW^{\phi'}(M^C, M^*) + M_n \pi'(M^N)$$
$$\Rightarrow \quad M^N \leq M^C \quad M^C \text{ is less restrictive}$$

Proof $M^F > M^C$

$$aW^{\phi'}(M^C, M^*) + (M^C - M_n)\pi'(M^C) + \pi(M^C) = -M_n\pi'(M^C) \geq 0$$

$$\text{and} \quad aW^{\phi'}(M^F, M^*) + (M^F - M_n)\pi'(M^F) + \pi(M^F) = 0$$

$$\Rightarrow \quad aW^{\phi'}(M^C, M^*) + (M^C - M_n)\pi'(M^C) + \pi(M^C) \geq aW^{\phi'}(M^F, M^*) + (M^F - M_n)\pi'(M^F) + \pi(M^F)$$

$$\Rightarrow \quad M^C \leq M^F$$

10.1.3 The benchmark equilibrium with repatriation of profits

The solutions of the world equilibrium with no lobbying and repatriation of profits $(M_0^\phi, M_0^{\phi*})$ are given by:

$$M_0^\phi \;=\; \arg\max_M \quad W^\phi(M, M^*)$$

$$M_0^{*\phi} \;=\; \arg\max_{M^*} \quad W^{\phi*}(M^*, M)$$

FDI barriers are restrictive (free-entry is not allowed) with positive repatriation of profit even when there is no lobbying: $M_0^\phi \leq M_0$.

Examples of restrictions $M_0^\phi < M_0$: assuming that the aggregate foreign domestic profits increase in M in the neighbourhood of M_0^ϕ.
By definition of M_0^ϕ, for all M^*, $W^{\phi'}(M_0^\phi, M^*) = 0$. We now assume that the aggregate foreign domestic profits increase in M: $\Pi^{f*'}(M_0^\phi) > 0$.
Then we have

$$W^{\phi'}(M_0^\phi, M^*) = H'(M_0^\phi, M^*) + \Pi'(M_0^\phi, M^*) + (1 - \phi)\Pi^{f*'}(M_0^\phi) = 0$$

$$\Rightarrow \quad W^{\phi'}(M_0^\phi, M^*) + \phi\Pi^{f*'}(M_0^\phi) > 0$$

$$\Rightarrow \quad W^{0'}(M_0^\phi, M^*) > 0$$

$$\Rightarrow \quad W^{0'}(M_0^\phi) > W^{0'}(M_0)$$

$$\Rightarrow \quad M_0^\phi < M_0$$

given that $W^{0'}$ is concave and reaches its maximum in M_0.

10.1.4 When is the grand coalition solution (M^C) higher (less restrictive) than the solution without lobbying (M_0^ϕ)?

We can show that:

1. If $-\Pi'(M^C) \geq \Pi^{f*'}(M^C) \Leftrightarrow M^C\pi'(M^C) + \pi(M^C) \leq 0$ then $\underline{M^C < M_0^\phi < M_0}$

   The loss of national profit is bigger than that gain of foreign profit. Or the marginal loss for all firms from more entry is bigger than the gain from one additional firm. Lobbying pushes the government to choose a more restrictive policy.

2. If $-\Pi'(M^C) \leq \Pi^{f*'}(M^C) \Leftrightarrow M^C \pi'(M^C) + \pi(M^C) \geq 0$ then $\underline{M_0 > M^C > M_0^\phi}$

The loss of national profit is smaller than that gain of foreign profit. Or the marginal loss for all firms from more entry is smaller than the gain from one additional firm. Lobbying pushes the government to choose a less restrictive policy.

Proof

$$aW^{\phi'}(M^C, M^*) + \Pi'(M^C) + \Pi^{f*'}(M^C) = 0$$
$$\Rightarrow \quad aW^{\phi'}(M^C, M^*) = -\Pi'(M^C) - \Pi^{f*'}(M^C)$$

If national lobbying dominates foreign lobbying

$$-\Pi'(M^C) \geq \Pi^{f*'}(M^C)$$
$$\Rightarrow \quad -\Pi'(M^C) - \Pi^{f*'}(M^C) \geq 0$$
$$\Rightarrow \quad aW^{\phi'}(M^C, M^*) \geq aW^{\phi'}(M_0^\phi, M^*)$$
$$\Rightarrow \quad M^C \leq M_0^\phi$$

10.2   Extension

10.2.1   Efficiency of the Nash solution when $\gamma < 1$

Proof   1. The subcoalitions are not binding: the solution is efficient.

The combination of the FOCs of the Nash product to find M, c and c^f gives:

$$aW'(M, M^*) + \Pi'(M) + \gamma\Pi^{f*'}(M) = 0$$

We can show that this is equivalent to maximising the joint surplus given the equilibrium expression of the foreign contribution c^f.

At the equilibrium we have:

$$
\begin{aligned}
aW(M, M^*) + c + \gamma c^f - G_0 &= \sigma^G[\mathbb{J} - G_0 - L_0 - L_0^f] \\
\Pi(M) - c - L_0 &= \sigma^N[\mathbb{J} - G_0 - L_0 - L_0^f] \\
\Pi^{*f}(M) - c^f - L_0^f &= \sigma^F[\mathbb{J} - G_0 - L_0 - L_0^f]
\end{aligned}
$$

This implies

$$\Pi(M) - c - L_0 = \frac{\sigma^N}{\sigma^F}[\Pi^{*f}(M) - c^f - L_0^f]$$

$$aW(M, M^*) + c + \gamma c^f - G_0 = \frac{\sigma^G}{\sigma^N}[\Pi(M) - c - L_0]$$

$$\Rightarrow \quad \Pi(M) - c - L_0 - \frac{\sigma^N}{\sigma^F}[\Pi^{*f}(M) - c^f - L_0^f] = 0$$

$$aW(M, M^*) - G_0 + [1 + \frac{\sigma^G}{\sigma^N}]c + \gamma c^f - \frac{\sigma^G}{\sigma^N}[\Pi(M) - L_0] = 0$$

$$\Rightarrow \quad [1 + \frac{\sigma^G}{\sigma^N}]\Big[\Pi(M) - L_0 - \frac{\sigma^N}{\sigma^F}[\Pi^{*f}(M) - c^f - L_0^f]\Big] + aW(M, M^*) - G_0 + \gamma c^f - \frac{\sigma^G}{\sigma^N}[\Pi(M) - L_0] = 0$$

$$\Rightarrow \quad \Big[(1 + \frac{\sigma^G}{\sigma^N})\frac{\sigma^N}{\sigma^F} + \gamma\Big]c^f + aW(M, M^*) - G_0 + \Pi(M) - L_0 - (1 + \frac{\sigma^G}{\sigma^N})\frac{\sigma^N}{\sigma^F}(\Pi^{*f} - L_0^f) = 0$$

We denote $\Omega = \Big[(1 + \frac{\sigma^G}{\sigma^N})\frac{\sigma^N}{\sigma^F} + \gamma\Big]$.

We replace the expression of c^f at the equilibrium in the joint surplus:

$$\mathbb{J}^C(M) = aW(M, M^*) + (\gamma - 1)c^f + \Pi(M) + \Pi^{*f}(M) + cte$$

$$\Rightarrow \quad = [1 - \frac{\gamma - 1}{\Omega}](aW(M, M^*) + \Pi(M)) + [\frac{\gamma - 1}{\Omega}](1 + \frac{\sigma^G}{\sigma^N})\frac{\sigma^N}{\sigma^F}\Pi^{*f} + cte$$

$$\Rightarrow \quad = \frac{1}{1 + \sigma^F(\gamma - 1)}(aW(M, M^*) + \Pi(M)) + \frac{\gamma}{1 + \sigma^F(\gamma - 1)}\Pi^{*f} + cte$$

$$\Rightarrow \quad = \frac{1}{1 + \sigma^F(\gamma - 1)}[aW(M, M^*) + \Pi(M) + \gamma\Pi^{*f}] + cte$$

Therefore the maximisation of the joint surplus given the equilibrium solution of the foreign contribution gives the following FOC:

$$aW'(M, M^*) + \Pi'(M) + \gamma\Pi'(M) = 0$$

This is the same as in the FOC found by maximising the Nash surplus.

The joint surplus in the grand coalition game is given by:

$$\mathbb{J}^C(M, M^*) = \frac{1}{1 + \sigma^F(\gamma - 1)}[aW(M, M^*) + \Pi(M) + \gamma\Pi^{*f}] + \frac{(\gamma - 1)}{1 + \sigma^F(\gamma - 1)}[-\sigma^F(G_0 + L_0) + (1 - \sigma^F)L_0^f]$$

2. The national subcoalition is binding: what is the solution that maximises the joint surplus when the national subcoalition is binding?
   We have

$$aW(M, M^*) + \gamma c^f + \Pi(M) = \mathbb{J}^N(M^N)$$

$$\Rightarrow \quad \gamma c^f = \mathbb{J}^N(M^N) - aW(M, M^*) - \Pi(M)$$

$$\mathbb{J}^C(M) = aW(M, M^*) + (\gamma - 1)c^f + \Pi(M) + \Pi^{*f}(M)$$

$$\Rightarrow \quad \mathbb{J}^C(M) = aW(M, M^*) + \frac{(\gamma - 1)}{\gamma}[\mathbb{J}^N(M^N) - aW(M, M^*) - \Pi(M)] + \Pi(M) + \Pi^{*f}(M)$$

$$\Rightarrow \quad \gamma\mathbb{J}^C(M) = aW(M, M^*) + \Pi(M) + \gamma\Pi^{*f}(M) + (\gamma - 1)\mathbb{J}^N(M^N)$$

Therefore the maximisation of the joint surplus given the equilibrium solution of the foreign contribution gives the following FOC:

$$aW'(M, M^*) + \Pi'(M) + \gamma\Pi'(M) = 0$$

This is the same as in the FOC found by maximising the Nash surplus.

3. The foreign subcoalition is binding.

10.2.2   Foreign sub-coalition when $\gamma < 1$

Finally we can show that the total surplus for the three players when the government and the foreign lobby play the political bargaining game is:

$$\mathbb{J}_\gamma(M_\gamma^F) = \frac{1}{\gamma(1 - \sigma_G) + \sigma_G}[aW(M_\gamma^F, M^*) + \gamma\Pi^{*f}(M_\gamma^F)] + \Pi(M_\gamma^F) + \frac{(\gamma - 1)[(1 - \sigma_G)G_0 + \sigma_G L_0^f]}{\gamma(1 - \sigma_G) + \sigma_G}$$

Proof We define the surplus of the two players $\mathbb{J}_\gamma^F(M) = aW^\phi(M, M^*) + (\gamma - 1)c^f + \Pi^{*f}(M)$.

$$aW^\phi(M, M^*) + \gamma c^f - G_0 = \sigma_G[\mathbb{J}_\gamma^F(M) - G_0 - L_0^f]$$
$$\Pi^{*f}(M) - c^f - L_0^f = (1 - \sigma_G)[\mathbb{J}_\gamma^F(M) - G_0 - L_0^f]$$

$$\mathbb{J}_\gamma(M) = aW^\phi(M, M^*) + (\gamma - 1)c^f + \Pi^{*f}(M)$$

$$\text{and} \quad aW^\phi(M, M^*) + \gamma c^f - G_0 = \frac{\sigma_G}{1 - \sigma_G}[\Pi^{*f}(M) - c^f - L_0^f]$$

$$\Rightarrow \quad \mathbb{J}_\gamma(M) = aW^\phi(M, M^*) + (\gamma - 1)\frac{-aW^\phi(M, M^*) + \frac{\sigma_G}{1 - \sigma_G}\Pi^{*f}(M)}{\gamma + \frac{\sigma_G}{1 - \sigma_G}} + \Pi^{*f}(M) + \Pi(M)$$

$$+ \quad \frac{(\gamma - 1)[(1 - \sigma_G)G_0 + \sigma_G L_0^f]}{\gamma(1 - \sigma_G) + \sigma_G}$$

$$\Rightarrow \quad \mathbb{J}_\gamma(M) = \frac{aW(M_\gamma^F, M^*) + \gamma\Pi^{*f}(M_\gamma^F)}{\gamma(1 - \sigma_G) + \sigma_G} + \Pi(_\gamma^F) + \frac{(\gamma - 1)[(1 - \sigma_G)G_0 + \sigma_G L_0^f]}{\gamma(1 - \sigma_G) + \sigma_G}$$

10.2.3   Comparative statics: M^N, M_γ^F and M_γ^C when $\gamma < 1$

(same as before)

Proof $M_\gamma^F > M_\gamma^C$

$$aW^{\phi'}(M_\gamma^C, M^*) + \gamma(M_\gamma^C - M_n)\pi'(M_\gamma^C) + \gamma\pi(M_\gamma^C) = -M_n\pi'(M_\gamma^C) \geq 0$$

$$\text{and} \quad aW^{\phi'}(M_\gamma^F, M^*) + \gamma(M^F - M_n)\pi'(M_\gamma^F) + \gamma\pi(M_\gamma^F) = 0$$

$$\Rightarrow \quad aW^{\phi'}(M_\gamma^C, M^*) + \gamma(M^C - M_n)\pi'(M_\gamma^C) + \gamma\pi(M_\gamma^C)$$

$$\geq aW^{\phi'}(M_\gamma^F, M^*) + \gamma(M_\gamma^F - M_n)\pi'(M^F) + \gamma\pi(M_\gamma^F)$$

$$\Rightarrow \quad M_\gamma^C \leq M_\gamma^F$$

because $\mathbb{J}_\gamma^F$ is an inversed U-shaped function that has a maximum in M_γ^F.

Proof $M^N <> M_\gamma^C$

$$aW^{\phi'}(M^N, M^*) + M_n\pi'(M^N) = 0$$

$$\text{and} \quad aW^{\phi'}(M_\gamma^C, M^*) + M_n\pi'(M^C) = -\gamma(M_\gamma^C - M_n)\pi'(M_\gamma^C) - \gamma\pi(M_\gamma^C)$$

case 1 If the intensive margin of the foreign lobby is higher : $\quad -(M_\gamma^C - M_n)\pi'(M_\gamma^C) \geq \pi(M_\gamma^C)$

$$\Rightarrow \quad aW^{\phi'}(M_\gamma^C, M^*) + M_n\pi'(M_\gamma^C) \geq 0 = aW^{\phi'}(M^N, M^*) + M_n\pi'(M^N)$$

$$\Rightarrow \quad M^N \geq M_\gamma^C \quad : \quad M_\gamma^C \text{ is more restrictive}$$

case 2 If the extensive margin of the foreign lobby is higher : $\quad -(M_\gamma^C - M_n)\pi'(M^C) \leq \pi(M_\gamma^C)$

$$\text{then} \quad aW^{\phi'}(M_\gamma^C, M^*) + M_n\pi'(M_\gamma^C) \leq aW^{\phi'}(M^N, M^*) + M_n\pi'(M^N)$$

$$\Rightarrow \quad M^N \leq M_\gamma^C \quad : \quad M_\gamma^C \text{ is less restrictive}$$

10.2.4 Taxation

Taxation on national revenues In the first stage the government chooses the tax rate τ on profits such that

$$\left[H'(M) + \Pi'(M) + (1 - \phi^*(\tau^*, \tau))\Pi^{f*'}(M)\right]\frac{\partial M}{\partial \tau} + \phi(\tau, \tau^*)\Pi^{f'}(M^*)\frac{\partial M^*}{\partial \tau}$$
$$-\phi_\tau^*(\tau^*, \tau)\Pi^{f*}(M) + \phi_\tau(\tau, \tau^*)\Pi^f(M^*) \quad = 0$$

In the second stage we have $\left[H'(M) + \Pi'(M) + (1 - \phi^*(\tau^*, \tau))\Pi^{f*'}(M)\right] = 0$.

Taxation on domestic profits The objective of the government is

$$\begin{aligned}
\mathcal{G}(M, M^*, \tau, \tau^*) &= W(M, M^*, \tau, \tau^*) + \tau[\Pi(M) + \Pi^{*f}(M)] \\
&= H(M) + (1 - \tau)[\Pi(M) + (1 - \phi^*(\tau^*, \tau))\Pi^{f*}(M)] + \phi(\tau, \tau^*)(1 - \tau^*)\Pi^f(M^*) \\
&\quad + \tau[\Pi(M) + \Pi^{*f}(M)] \\
&= H(M) + \Pi(M) + [\tau + (1 - \tau)(1 - \phi^*(\tau^*, \tau))]\Pi^{f*}(M) + \phi(\tau, \tau^*)(1 - \tau^*)\Pi^f(M^*)
\end{aligned}$$

In the first stage the government chooses the tax rate τ on profits such that

$$\left[H'(M) + \Pi'(M) + [\tau + (1 - \tau)(1 - \phi^*(\tau^*, \tau))]\Pi^{f*'}(M)\right]\frac{\partial M}{\partial \tau}$$

$$+ \quad \phi^*(\tau^*, \tau)\Pi^{*f}(M) + \phi(\tau, \tau^*)(1 - \tau^*)\Pi^{f'}(M^*)\frac{\partial M^*}{\partial \tau}$$

$$- \quad (1 - \tau)\phi_\tau^*(\tau^*, \tau)\Pi^{*f}(M) + \phi_\tau(\tau, \tau^*)(1 - \tau^*)\Pi^f(M^*) = 0$$

In the second stage we have $\left[H'(M) + \Pi'(M) + [\tau + (1-\tau)(1 - \phi^*(\tau^*, \tau))]\Pi^{f*'}(M)]\right] = 0.$