Courting FDI: Is Competition Bad?

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I. Introduction

One of the most important features of the trend toward globalization in recent times has been the increased importance of foreign direct investment around the world. Together with this increase in FDI, competition among potential hosts to attract FDI has intensified as well. To the extent that foreign direct investment projects generate positive externalities for the host countries, related to activities such as innovation or labor training, there is a case for countries to offer subsidies in order to lure potential investors to locate within their boundaries. However, the increase in the intensity of competition observed in recent years has raised concerns regarding its effects on the welfare of host countries. In particular, as a result of competition, foreign firms may be able to appropriate all the benefits associated to FDI. This raises a number of important questions: What are the effects of competition for FDI on the welfare of the world as a whole? Are host countries better off by banning incentives for FDI? Should these countries restrict competition in any way? In this paper, we develop a model of competition for FDI in order to answer some of these important questions.

A striking illustration of the increased intensity of competition for FDI is provided in table 1, which is reproduced from Oman (2000a). The table, which is based on unofficial sources, shows the cost of the subsidy per worker for a set of 14 FDI projects in the automobile sector, both in developed and developing countries, during a period spanning from 1980 to 1997. The escalation of costs is remarkable.

<table>
<thead>
<tr>
<th>Date of Package</th>
<th>Country of Project</th>
<th>Investor</th>
<th>Amount per Job* (US dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>United States</td>
<td>Honda</td>
<td>4000</td>
</tr>
<tr>
<td>Early 1980s</td>
<td>United States</td>
<td>Nissan</td>
<td>17000</td>
</tr>
<tr>
<td>1984</td>
<td>United States</td>
<td>Mazda-Ford</td>
<td>14000</td>
</tr>
<tr>
<td>mid-1980s</td>
<td>United States</td>
<td>GM Saturn</td>
<td>27000</td>
</tr>
<tr>
<td>mid-1980s</td>
<td>United States</td>
<td>Mitsubishi-Chrysler</td>
<td>35000</td>
</tr>
<tr>
<td>mid-1980s</td>
<td>United States</td>
<td>Toyota</td>
<td>50000</td>
</tr>
<tr>
<td>mid-1980s</td>
<td>United States</td>
<td>Fuji-Isuzu</td>
<td>51000</td>
</tr>
<tr>
<td>Early 1990s</td>
<td>United States</td>
<td>Mercedes Benz</td>
<td>168000</td>
</tr>
<tr>
<td>1992</td>
<td>Portugal</td>
<td>Ford-Volkswagen</td>
<td>265000</td>
</tr>
<tr>
<td>1995</td>
<td>Brazil</td>
<td>Volkswagen</td>
<td>54000-94000</td>
</tr>
<tr>
<td>1996</td>
<td>Brazil</td>
<td>Renault</td>
<td>133000</td>
</tr>
<tr>
<td>1996</td>
<td>Brazil</td>
<td>Mercedes Benz</td>
<td>340000</td>
</tr>
<tr>
<td>1997</td>
<td>Germany</td>
<td>Volkswagen</td>
<td>180000</td>
</tr>
<tr>
<td>1997</td>
<td>India</td>
<td>Ford</td>
<td>200000-420000</td>
</tr>
</tbody>
</table>

Note*: Estimated value of fiscal and financial incentives supplied by national and sub-national governments to a particular investment project, divided by the number of jobs the project was expected directly to create.

Sources: Unofficial, cited in Donahue (United States), Bachtier et al. (Europe), Da Motta Veiga and Iglesias (Brazil) and Venkatesan et al. (India)

There are several reasons why the intensity of competition for FDI may have increased in recent years. One of them is the spectacular increase in the volume of FDI itself. This increase means that the stakes in the quest to attract FDI are now much higher. Figure 1 shows the evolution of FDI outflows for OECD countries between 1982 and 1997, in constant 1997 dollars. During this time span, these FDI flows have increased by a factor of 11. To put this in proper
context, during the same period, world trade flows increased by a factor of 2. This trend has not slowed down in recent years. For 1997, FDI outflows from OECD countries are nearly twice as high as they were during the early 1990s. FDI flows to the developing world and, in particular, to Latin America, have increased at an even faster rate.  

![Figure 1](image)

Furthermore, while FDI flows to the developing world have increased so spectacularly, other forms of capital flows have remained fairly stagnant. In fact, FDI represents by far the most important source of private external finance to Latin America in recent years, as can be clearly seen in Figure 2. The figure suggests that, when it comes to private external financing for developing countries, FDI has virtually become the “only game in town”.

Another reason for the intensification of the competition is the increased number of players in this “game”. Countries that used to discourage FDI, such as China, have become major players. At the same time, several countries have experienced a trend toward decentralization, accompanied by greater political and fiscal autonomy of subnational governments. In some countries, such as Brazil, subnational governments have also recently become major players in this game. In fact, the escalation of subsidies for FDI in the automobile sector shown in table 1 has for the most part resulted from competition among subnational units of government within the same country, rather than competition among countries.

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1 FDI flows to developing countries have increased between 1982 and 1997 by a factor of 12, while flows to Latin America have increased by a factor of 14.
2 Figure 2 is reproduced from Fernandez-Arias (2000)
3 See discussion in Oman (2000a)
The relevant space of competition for FDI is defined not only by the willingness of potential host countries to engage in competition, but also by the nature of the goods produced, and the existence of natural and policy-induced barriers to trade. The more tradable the goods, and the lower the barriers to trade, the greater the scope for competition. The reduction in trade barriers experienced in most of the world has increased the space of competition. Similarly, the appearance of new activities such as e-business, which can provide similar services to the entire world from any location, may potentially increase the intensity of competition as well.

Competing by offering subsidies is not the only way for countries to court potential investors. Oman (2000b) discusses other forms of competition, both benign and potentially harmful. Countries could compete by improving their institutions, the quality of their labor force or the quality of their infrastructure. This competition, which Oman refers to as “beauty contest” would obviously have positive externalities. On the other hand, countries could compete by relaxing labor or environmental standards, which could have obvious adverse effects on the welfare of the population. While these other forms of competition may also be important, in this paper we focus exclusively on the effects of incentive-based competition.

We assume that countries make welfare-maximizing decisions concerning the subsidies they offer to foreign investors. Therefore, the willingness to offer subsidies reflects the existence of social returns in excess of private returns. In this paper we simply assume the existence of positive externalities associated with FDI (or equivalently, the possibility of expropriating private rents), without elaborating on their nature.\(^4\) This is the basis of a vast literature on the virtues of FDI and also the prevalent view among policymakers in host countries. However, there are studies challenging the existence of such externalities.\(^5\) In that case subsidies would reflect

\(^4\) This framework encompasses subsidies designed to benefit from tax revenues, as in Bond and Samuelson (1986).

\(^5\) See for example discussion in Hanson (2000)
II. A simple model of competition for FDI

In this section we consider the returns of FDI, both private and social. To the extent that social returns exceed private returns, i.e., there are positive externalities, welfare-maximizing governments may be willing to provide subsidies to ensure that investment takes place. To make the problem interesting we assume that there are in fact positive externalities associated with FDI. Furthermore, we assume that the social return of investment exceeds the cost of capital, because otherwise there would be no rationale for subsidies either. Throughout this article, we abstract issues of uncertainty, as well as from the well-known agency and fiscal problems that the implementation of subsidies usually entails. To simplify bargaining issues, we assume that countries have all the bargaining power vis a vis firms and can make take-it-or-leave-it transfer offers. The borrowing cost of firms is r, which puts a floor to the offers that are acceptable.

Let \( p \) be the private return of investment appropriated by the investor, \( e > 0 \) the social externality associated with it, and \( t \) the public transfer subsidy provided, all measured per unit of investment. Then the social rate of return of FDI is \( s = p + e \). We note that \( s \) measures the productivity of investment, which brings efficiency gains as long as it exceeds the cost of capital \( (s \geq r) \). The overall social return is then divided between the country and the firm. The corresponding net benefit to the country, per unit of investment, is \( b = e - t \), and the remainder, \( s - b = p + t \), is appropriated by the firm. In what follows, when necessary, we will consider investment project schedules, indexed by \( z \), and subindexes to denote countries in which the projects localize, so that, for example, \( p_c [z] \) refers to the private return of project \( z \) localized in country \( c \).

To simplify notation, in what follows we will not restrict the value of feasible transfers \( t \). Therefore transfers could be negative, in which case they ought to be interpreted as taxes. Nevertheless, conclusions are not altered if they are restricted to be non-negative.

Furthermore, it is worth noting that there are alternative interpretations of these same symbols that would give rise to additional interesting conclusions. First, instead of countries we could consider regions within a country, so that transfers to investors would be extended by subnational governments. Second, the social externality \( e \) could refer to the degree of expropriation that foreign investors expect in the future, which would leave a post-expropriation return of \( p \). In this case the transfer would be an offset of the expropriation risk, and there could be a role for transfers even in the absence of true social externalities.\(^6\) To keep the presentation simple, in what follows we will stick to the initial interpretation.

We will consider two polar cases, those of investments for the production of non-traded and traded goods, respectively.

A. The case of No Competition

Consider the case in which investment produces non-traded goods (either due to natural or policy-driven costs to international trade), so that competition from other countries does not occur. Investment projects only serve the country in which they localize, which rules out competition. An example of such investment could be investment in a supermarket chain such as

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\(^6\) See discussion of this time inconsistency motive for subsidies in Boadway and Shah (1995)
Carrefour. Alternatively, goods may be traded but the productivity of other countries is so low that their competition is effectively irrelevant.

**PROPOSITION 1.** IN THE NO COMPETITION CASE, SUBSIDIES ACHIEVE FULL EFFICIENCY AND MAXIMUM NET BENEFIT TO THE HOST COUNTRY.

**COROLLARY:** THERE IS NO REASON TO RESTRICT SUBSIDIES TO INVESTMENT IN NON-TRADEABLES.

**PROOF.** With no competition, localization is not an international concern. Each host country considers transfers $t$ such that:

$$\max_t (e-t) \text{ subject to } e \geq t \text{ (public incentive to attract FDI)}$$

$$p+t \geq r \text{ (private incentive to invest)}$$

Equivalently, the transfer is minimized. Optimal transfer is $t^*=r-p$, so that investment is made at the minimum return to the investor $p+t^*=r$. Note that since $s=p+e \geq r$, it follows that $e \geq t^*$.

Allocative efficiency is obtained because any efficient investment ($s \geq r$) is realized. The maximum net benefit to the host country is obtained, as investors make zero profit. (Note that if private returns are very high, i.e. $p>r$, the optimal transfer is negative. If negative transfers are ruled out, efficiency is preserved. The benefit to the host country is correspondingly reduced, but it still benefits from positive transfers.)

The model presented here can be easily extended to a continuum of projects. Rather than a full blown extension of the analytical model, here we will present the argument in a graphical way, focusing in particular on a simple example which can provide further intuition for the results, and at the same time offer some additional insights.

Let us assume that there is a continuum of investment projects, which we will index by $z$, and that these projects are ordered according to the private rate of return on the investment in the host country. For the purposes of keeping the examples as simple as possible, we will assume that all projects generate an externality of the same size, $e$. Investors face a flat cost of borrowing, $r$. An investment project $z$ is implemented in the host country when $p(z)+t>r$, i.e. when the private rate of return of the project plus the subsidy exceeds the cost of borrowing funds. The problem is represented in Figure 3. Assuming that negative transfers cannot be imposed, the government provides a transfer of $\max (r-p(z), 0)$ just large enough for the project to be implemented. The total transfer is represented by the area $DEF$. If negative transfers are feasible, as in the analytical model, the transfer in each project is simply $r-p(z)$, which results in a total transfer equal to $DEF-GAD$ which, as is obvious from the figure, can be negative. The total number of projects implemented is given by $q_1$, which is the efficient allocation (as in part 1 of Proposition 1). The net benefits for the host country are given by area $ABCED$, in case negative transfers are not possible, or simply $GBE$, the area between $s(z)$ and $r$, if negative transfers are feasible. In each case, the net benefits for the host country are maximized (this corresponds to the second part of proposition 1).
If subsidies were banned, the quantity of projects implemented would be given by \( q_0 \), that is, the projects that do not require a subsidy, for which \( p(z) > r \). Notice that in this case, some projects whose social rate of return exceeds the interest rate are not implemented, i.e., the outcome is inefficient. This reduction in the number of projects implemented when subsidies are eliminated can be thought of as a negative FDI creation (or FDI destruction) effect, since it is analogous to the concept of trade creation developed by Viner (1950). The net benefits for the host country are, in this case, \( ABCD < ABCED \). Thus, in the case of investment in non-traded goods, it would be harmful for host countries to restrict the use of incentives for FDI. (this corresponds to the corollary to proposition 1)

**B. The case of Open Competition**

From now on, we consider the case in which FDI produces traded goods. We assume that there are strong economies of scale and low trade barriers, so that investments in traded goods localize in only one country, and serve the entire world. Our paradigm in this case is e-business. This opens the possibility and incentives for host countries to engage in subsidy competition, as well as the policy issue of whether to constrain competition and how to do it. In this section we analyze the case of open competition, in which each country is free to offer any level of subsidy to each FDI project.\(^7\) The following sections deal with deviations from this open competition benchmark.

To simplify the analysis we consider only two potential host countries in a position to compete for FDI localization, but results generalize. The notation of the previous section now applies to each country, which will be distinguished by subindices 1 and 2. Without loss of generality, we will assume that country 1 is more productive than country 2, i.e., \( s_1 \geq s_2 \). Country 1 complies with the assumptions of the previous section that ensure incentives to provide subsidies, i.e., \( e_1 > 0 \) and \( s_1 \geq r \).

\(^7\) After a first draft of this paper was prepared, Black and Hoyt (1989) was brought to our attention. In their model they also obtain that US states bidding for firms (to increase tax revenues) contributes to allocative efficiency.
PROPOSITION 2. SUBSIDIES ACHIEVE FULL EFFICIENCY.

COROLLARY. IN A SYMMETRIC WORLD (IN WHICH COUNTRIES ARE BOTH SOURCE AND HOSTS OF FDI), SUBSIDIES MAXIMIZE WELFARE TO EACH COUNTRY AND, THEREFORE, THERE IS NO GROUND TO RESTRICT SUBSIDIES

PROOF. In the case of tradable goods, localization is an international concern because, by virtue of the assumption of strong economies of scale, if FDI localizes in one country no other country gets it. To simplify the proof, let’s assume that there are only two relevant countries, i.e., only two countries can possibly attract the localization of FDI, denoted by 1 and 2. Country 1 and country 2 consider transfers $t_1$ and $t_2$ to compete for the localization of FDI such that:

Max $_{11}$ (e$_1$-$t_1$) subject to $e_1$-$t_1$+P$_1$+t$_1$ $\geq$ r $\geq$ $e_1$ $\geq$ t$_1$ (public incentive to attract FDI)

Max $_{12}$ (e$_2$-$t_2$) subject to $e_2$-$t_2$+P$_2$+t$_2$ $\geq$ r $\geq$ $e_2$ $\geq$ t$_2$ (private incentive to localize in country 1)

The key difference with respect to the non-tradable problem is the third constraint, which encapsulates the competition, or bidding war, between potential host countries.

The solution to the above problem is such that the country with the largest social return gets the localization of FDI. In other words, transfer competition results in a social return equal to Max (s$_1$=p$_1$+e$_1$, s$_2$=p$_2$+e$_2$), that is to say, allocative efficiency. Under our assumption (s$_1$ $\geq$ s$_2$), without loss of generality, FDI will localize in country 1 after it makes a winning transfer offer t$^*$$_1$=Max (r-p$_1$, s$_2$-p$_1$). This offer gives the firm an overall return p$_1$+t$^*$$_1$ that matches its cost of capital r and the social return in country 2, whichever is larger. The simplest case is the one in which the social return in country 2 is insufficient for a productive investment (s$_2$<r), which effectively removes competition. In this case the problem boils down to the non-traded case analyzed in the previous section, in which in fact t$^*$$_1$=r-p$_1$, and the conclusion follows.

The more interesting case is when country 2 is also efficient (s$_2$ $\geq$ r) and competition is relevant. In this case, t$^*$$_1$= s$_2$-p$_1$, larger than under no threat of competition. First we check that this is an incentive-compatible transfer, since under the assumption that s$_1$ $\geq$ s$_2$, e$_1$= s$_1$- p$_1$ $\geq$ s$_2$ - p$_1$= t$^*$$_1$ (the public incentive to attract FDI holds) and in this case p$_1$+ t$^*$$_1$=s$_2$-r (private incentive to invest holds). Second we check that country 2 has no incentive-compatible transfer that beats this offer (the private incentive to localize in country 1 holds). In fact, with this offer the investor gets an overall return of p$_1$+ t$^*$$_1$=s$_2$. It is easy to check that this can be matched by country 2 if it offers t$_2$=e$_2$, so that p$_2$+t$_2$=s$_2$. However, country 2 could better this offer granting all of its social return to the investor only by offering a transfer in excess of its externality, which is a losing proposition. Finally, it is also clear that any lower offer by country 1 would be bettered by country 2.

Therefore, subsidies ensure that FDI localizes where it is most productive. This efficiency result may or may not translate into welfare gains for each individual participant, an issue which is not analyzed in this proposition. Nevertheless, an important corollary of this proposition is that
within a symmetric set of countries in which all of them are both source and hosts of FDI in such a way that net subsidies are null in each individual country, this full efficiency result also means maximum welfare for each one.

**PROPOSITION 3. THE WINNING HOST COUNTRY CAPTURES A NET BENEFIT NOT LARGER THAN ITS EXCESS OF SOCIAL RETURN \((S_1 - S_2)\).**

**COROLLARY:** IF HOST COUNTRIES HAVE THE SAME SOCIAL RETURN, UNRESTRICTED SUBSIDIES LEAD TO INVESTORS APPROPRIATING THE FULL COMMON SOCIAL RETURN LEAVING NO NET BENEFIT FROM FDI TO COUNTRIES.

**PROOF.** From Proposition 2, without loss of generality, winning host country 1 provides a transfer \(t^* = \text{Max} \left( r - p_1, s_2 - p_1 \right) \). Its net benefit is therefore \(c_1 - t^* = \text{Min} \left( s_1 - r, s_1 - s_2 \right) \), so that with effective competition from country 2 \((s_2 \geq r)\) the net benefit to country 1 only amounts to the excess of social return over country 2. At the same time, the investor obtains an overall return of \(\text{Max} \left( r, s_2 \right)\), so that, to the extent that there is effective competition, it gets the full amount of the social return in the losing country, a positive profit. Therefore if both countries have the same social return \((s_1 = s_2)\), then the net benefit of the winning country is null and the investor appropriates the entire common social return \(s\) \((p_1 + t^* = s)\).

**III. Should subsidies for FDI be banned?**

If subsidy competition to attract FDI leads to bidding wars to the benefit of foreign investors, it may be expected that a ban on subsidies, if enforceable, would work to the advantage of host countries. In this section we ask ourselves what would be the efficiency and distributional implications of such a ban, in particular concerning the welfare of host countries. To simplify the analysis, like in the previous section we consider a world in which the North (the source of FDI) considers whether to locate in the South, and if so, in which of the two Southern countries, 1 and 2. It is clear that any restriction to subsidies by Southern countries tends to reduce incentives for FDI location in the South, so that in analyzing the effects of restrictions to subsidies the interesting case is one in which under unrestricted subsidies FDI would locate in the South, which we assume. Therefore we keep the assumptions made in the previous section, which as we saw imply that FDI localizes in country 1 and that the South obtains a net benefit of \(\text{Min} \left( s_1 - r, s_1 - s_2 \right)\), captured by winning country 1.

**PROPOSITION 4. A BAN ON SUBSIDIES IS INEFFICIENT AND HAS AN AMBIGUOUS WELFARE EFFECT ON HOST COUNTRIES.**

**PROOF.** We first determine FDI localization under a ban on subsidies. In the absence of subsidies, the relevant returns to investors are private returns \(p\), which are not a measure of overall productivity in the presence of externalities. The loss of efficiency springs from two sources. The first case is FDI creation, or destruction in this case. FDI may fail to come to any host country because private returns are below the cost of capital \((p_1 < r\) and \(p_2 < r\)). Relative to unrestricted subsidies, this implies a loss of efficiency equal to \(s_1 - r \geq 0\) and a loss of host country welfare equal to \(\text{Min} \left( s_1 - r, s_1 - s_2 \right) \geq 0\). If social returns are different between countries, the destruction of efficient projects leads to welfare losses.

The second case is FDI diversion. FDI may come because there is a private return that is higher than the cost of capital but end up locating in the wrong host country. This would occur as
long as the country with the highest productivity as measured by social returns (which gets FDI under competition in Proposition 2) is not the one with the highest private return (which would get FDI under a ban). In our case, FDI diversion takes place when $p_2 > p_1$ (provided that $p_2 \geq r$ so that FDI is not destroyed). In this case a ban leads to an allocative efficiency loss of $s_1 - s_2 \geq 0$. This switching between private and social returns is possible only if the externality in country 1 is sufficiently larger than that in country 2. The net benefit for the winning country, now country 2, is the amount of the externality $e_2$. Whether this benefit exceeds that obtained under subsidies by country 1, $s_1 - s_2$, is ambiguous. However if the externality in country 1 is sufficiently larger than that in country 2, then unrestricted competition is better than a ban under FDI diversion. It is easy to check that that is the case if $e_1 > 2e_2 + (p_2 - p_1)$.

Finally, when there is no FDI destruction or diversion, then there is no allocative change and no inefficiency. This is the most favorable case for a ban on subsidies, because the elimination of transfer $t^*_1 \geq 0$ translates into additional welfare to host countries. This is certainly the case if countries are identical.

As in the case of investment in the non-traded sector, it is useful to complement the model with a graphical example for the case of a continuum of projects. The problem of the convenience of a ban in transfers is depicted in Figures 4 and 5. Figure 4 presents a simple example in which country 1 has higher private and social returns to each one of the projects, and in which the externality is constant across projects.

**Figure 4: The effects of a ban on subsidies under competition**

The case of no switching between private and social returns

Unrestricted competition, as always, leads to the efficient outcome. The efficient number of projects $q_1$ get done, and they are all located in country 1, where the social rate of return is higher (this corresponds to proposition 2 in the previous section). Country 1 sets the optimal transfer $t^*_1(z) = \min \left[ e_1, \max (r - p_1, s_2 - p_1) \right]$, that is, a transfer that provides enough resources for the returns to the foreign firm to reach $r$, or to match the highest offer of country 2, provided it does not exceed the externality $e_1$. The total amount of the transfer (for the case of no negative
transfers) is given by the area AGIEF, and country 1 appropriates net benefits given by the area GBEIH.

Under a ban on subsidies, the outcome is inefficient (proposition 4). The number of projects implemented in country 1 is $q_1$. In this case, net benefits for this country are given by the area ABCD. The two shaded areas in the figure represent the gains and losses associated with the ban. The area AGHD represents the gain from imposing the ban, while the area HCEI represents the loss of such a policy. The net result is ambiguous (second part of proposition 4) and depends among other things on the excess of social return, on the size of the externality in country 2, and on the interest rate $r$.\(^8\) It is easy to see from Figure 4 that if social returns across countries were similar ($s_1(z)=s_2(z)$) any gains for the host country from competition in subsidies would dissipate, leaving host countries with no gains from FDI (corollary to proposition 3). Obviously, in this special case a ban on subsidies is convenient.

**Figure 5: The effects of a ban on subsidies under competition**

The case of reswitching between private and social returns

Figure 5 presents the case in which there is “reswitching” between private and social returns, i.e., when the country with the highest social returns is not that with the highest private returns. It clearly shows the effects of the ban on subsidies through FDI destruction and FDI diversion. FDI destruction is represented by $q_1 - q_0$. These are the projects that will not be implemented in either country, even when the social rate of return is high enough. The two shaded areas to the right of $q_0$ represent the losses for the host countries (in this case, country 1) and the foreign firms due to the FDI destruction effect. The number of projects that get diverted is represented by $q_0$. These are projects that would be more productive in country 1, but that under a

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\(^8\) For the example shown in the figure, with linear private and social return functions, it is easy to show that increases in $r$ reduces the net gains from the imposition of a ban.
ban on subsidies are undertaken in country 2 instead. The loss, represented by the shaded area to the left of $q_0$ is incurred by country 1. Meanwhile, the area between $p_2$ and $s_2$, to the left of $q_0$, represents a loss for the foreign firm, and a gain for country 2. The total loss in efficiency is given by the sum of all three shaded areas.

The bottom line of this section is that it is not clear whether a ban on subsidies improves upon unrestricted subsidy competition. Even if it does for the potential host countries as a whole, if there is FDI diversion the gains would be unevenly distributed. In fact, with the ban on subsidies FDI would switch from country 1 to country 2, which implies a loss to country 1. At the same time, if FDI continues to be localized in country 1, then country 1 wins from the ban. The net welfare impact on country 1 of adopting a comprehensive ban over all FDI projects depends on the distribution of projects. If this impact is negative, then such agreement would require side payments from country 2 to country 1 to make it incentive-compatible.

IV. Agreements to restrict subsidy competition

As we saw in the previous section, a ban on subsidies is bad for the world and may fail to benefit host countries. While competition certainly bids up subsidies and in that way conspires against the welfare of host countries, it is also an efficient mechanism to allocate investment in countries with high (social) productivity. In that sense, a ban on subsidies appears to be a brutal method to restrict competition. In this section we examine alternative agreements that restrict competition while preserving some of its efficiency features, for which the ability to offer subsidies needs to be retained. To simplify we abstract from ex-post enforcement problems.

The first class of agreements we consider is one in which there is no restriction on the subsidy schedules that can be agreed upon and enforced among host countries. We refer to this class as unrestricted agreements. We then consider a class of agreements in which countries cannot be discriminated, and therefore the agreed upon subsidy schedules are common across countries. Subsidy agreements are to be interpreted as ceilings, so that countries retain the ability to determine their own transfers as long as they do not exceed the agreed upon caps.

**Lemma.** An unrestricted agreement on country subsidies achieves full efficiency and the first best for host countries.

**Proof.** It is clear that an unrestricted agreement to collude to limit competition achieves the first best. The first best consists in attracting all efficient FDI projects to the most productive country in such a way that investors obtain zero profit. Under our assumptions, that means to have country 1 succeed in doing what it would be able to do in the case of non-traded goods. According to Proposition 1 this would be achieved by offering $t^*_1 = r - p_1$. The only problem is that if other countries better this offer trade would be diverted. To ensure that this does not happen it is necessary to impose conditions on other countries to remove them as effective competitors. Short of a prohibition, in terms of transfers, the agreement could stipulate any transfer offer by country 2 ($t^*_2$) be less than $r - p_2$. (If this transfer is negative and negative transfers are ruled out, then country 2 would be assigned a zero transfer offer and country 1 would be assigned the minimum transfer consistent with being selected, that is $\max(p_2 - p_1, 0)$).

Would this agreement be in the interest of the signatory countries? Obviously this is always the case in an efficient arrangement provided that side payments are allowed. In this case, however, side payments are not needed for ex-ante incentive compatibility. In fact, the agreement delivers a welfare improvement to country 1 and no welfare reduction to country 2.
Nevertheless, it is to be expected that country 2 would like to also benefit from the agreement, which would require the stipulation of side payments payable to countries not receiving FDI.

In what follows, we restrict the agreements to the imposition of caps on subsidies, common across countries. Think of these agreements as a delegation of the power to set caps on transfers to a supra-national authority. In this case, we have:

PROPOSITION 5. AN AGREEMENT ON COMMON COUNTRY SUBSIDIES IS BETTER FOR HOST COUNTRIES THAN BOTH OPEN COMPETITION AND A BAN ON SUBSIDIES.

PROOF. The weak dominance of an agreement subject to non discrimination across countries is easily established by showing that it can always replicate the outcome obtained under both unrestricted competition and a ban on subsidies. First, a ban on subsidies is a particular case of a common subsidy agreement in which the subsidy is set equal to 0. Second, an agreement stipulating subsidy ceilings at very high levels, beyond those obtaining under unrestricted competition, would not be binding and therefore would allow unfettered competition.

However, dominance is strong. If there is no country reswitching between social and private returns, i.e., if \( p_1 \geq p_3 \), then an agreement on common subsidy caps, i.e., \( t^* \geq t^*_1 \) and \( t^* \geq t^*_2 \), replicates the optimal agreement in the previous Lemma and attains the first best. In fact, with no reswitching, with a common transfer \( t \) the private incentive to localize in country 1 holds (\( p_1 + t \geq p_2 + t \)). Setting \( t^* = r - p_1 \), which replicates the previous first best assignment for country 1, the first best is achieved. This subsidy ceiling corresponds to the non-traded case of Proposition 1, in which competition is not relevant. In fact, in this case country 1 would choose to offer such ceiling (\( t^*_1 = t^* \)) and country 2 would not be able to improve upon it. (If this transfer is negative and negative transfers are ruled out, then zero transfer is optimal.)

In case of reswitching, the problem gets more complicated. There are two cases, depending on the relative size of \( e_2 \) and \( s_1 - s_2 \), which are depicted in Figures 6 and 7. Figure 6 presents the case in which \( e_2 < s_1 - s_2 \). In this case, a supra-national authority representing the interests of the host countries would allow them to engage in unrestricted competition. To see this, consider the three regions depicted in Figure 6. In region 1, there is no competition from country 2, since \( s_2 < r \). Thus, there is no reason to restrict competition. Country 1 will provide a transfer equal to \( r - p_1 \), and will receive the investment, with net benefits equal to \( s_1 - r \), as in the case of no competition. In region 2, unrestricted competition will also result in maximum net benefits for the host countries, as \( s_1 - s_2 \) is larger than \( s_2 - r \). Country 1 gets the projects in this region by paying transfers equal to \( s_2 - p_1 \). Finally, in region 3, unfettered competition also maximizes net benefits for the host countries, since \( s_1 - s_2 \geq e_2 \). As in region 2, here country 1 supplies transfers equal to \( s_2 - p_1 \). Therefore, under conditions of reswitching, when \( e_2 < s_1 - s_2 \), the supra-national authority would place no restrictions on subsidy competition. The result is efficient, but the net benefits for host countries are lower than under the case of no reswitching, which coincides with the case of no competition.
The case of reswitching when $e_2 < s_1 - s_2$

Figure 7 presents the case in which $e_2 > s_1 - s_2$. In this case, there are four regions to consider. The first is the region in which the social return is greater than $r$ in country 1, but not in country 2. In this region, the supra-national authority will allow unrestricted competition, since there is no actual competition. Country 1 will provide a subsidy equal to $r - p_1$, and will win the project. Region 2 represents the projects for which both countries have social returns higher than $r$, but where $s_1 - s_2 > s_2 - r$. This inequality means that the net benefits if country 1 wins the project are larger than the net benefits if country 2 wins it instead. In this region, again the supra-national authority would allow unrestricted subsidy competition, and country 1 will win the projects with a subsidy equal to $s_2 - r$, and with net benefits of $s_1 - s_2$. The third region differs from the second one in that now, $s_2 - r < s_1 - s_2$. In this region, total net benefits for the host countries are maximized with a ceiling on subsidies equal to $s_2 - r$. Notice that in this case, country 2 wins the projects, so the outcome is not efficient. A ban on subsidies in this region would not work, since private returns are not high enough, so projects would not come. In contrast, in region 4 the supra-national authority sets a ban on transfers. Again, in this case foreign firms come to country 2, so the outcome is not efficient. As in the case of FDI diversion under a ban on subsidies, country 1 loses from the agreement for the case of projects in regions 3 and 4, and may require side payments in case these losses are not compensated by gains in other projects (in which there is no reswitching, or in which there is reswitching but the roles of country 1 and country 2 are reversed)
IV. Summary and conclusions

In this paper, we have examined the consequences of competition among host countries to attract foreign direct investment, as well as the convenience of limiting this competition in different ways. Unfettered competition in subsidies achieves the efficient allocation of investment projects, but under some conditions may cause harm to the host countries, as the foreign firms may end up appropriating most of the net benefits of foreign direct investment.

The first policy measure we considered was a ban on subsidies. Eliminating subsidies reduces the welfare of the world as a whole, since the efficient allocation of investment projects is no longer achieved. As in the classic contributions of Viner (1950) to the theory of customs unions, there are two different effects of banning competition: FDI destruction (or negative FDI creation) and FDI diversion. By FDI destruction we refer to the case of investment projects for which the social return (but not the private return) exceeds the interest rate, which will not be implemented. By FDI diversion we refer to the case of investments that will be allocated to “the wrong country”, one that does not have the highest social rate of return. In contrast to the case of customs unions, however, in the case of FDI both effects, destruction and diversion, go in the same direction. This means that, abstracting from distributional considerations, from the perspective of the welfare of the world it would make no sense to ban subsidies for FDI.

Whether such a measure makes sense for the host countries is ambiguous. If the host countries are identical, the foreign firm appropriates all the net benefits under unrestricted competition, and the ban is convenient provided there is some investment which generates positive externalities that takes place. More generally, the convenience of a ban for the host countries will depend negatively on the difference in social returns among the host countries, and positively on the number of projects for which private returns exceed the interest rate, as well as...
on the size of the externalities associated with those projects in the countries with the highest private returns.

Regardless of the merits of a ban for the host countries *vis a vis* unfettered subsidy competition, it is possible for host countries to do better by delegating the power to set the transfer schedule (or more precisely, a ceiling on transfers for each project) to a supra national authority. In the case in which the country with the highest social rate of return for each project is also the one with the highest private rate of return for that project (i.e. the case of non reswitching), the supra-national authority would set a ceiling on subsidies equivalent to the subsidies chosen by a country in the case of non-traded goods, i.e, transfers which cover the difference between the interest rate and the private returns, without exceeding the size of the externality. This policy achieves the efficient allocation of investment and at the same time maximizes the welfare of the host countries. In fact, if negative transfers are not ruled out, this solution diverts all the net benefits of FDI to the host countries, leaving the foreign companies without profits.

In the case of “reswitching”, i.e, when the country with the highest social return is not always that with the highest private return, delegation to a supra-national authority does not achieve efficiency, unless the supra-national authority, in addition to defining a transfer ceiling per project that does not discriminate across countries, is also allowed to allocate investment. Barring this, the efficient quantity of investment gets implemented (i.e., there is no FDI destruction), but investments are not always allocated to the country with the highest social returns (i.e., there is some FDI diversion). In addition, while they do better than they would under a ban on subsidies or under unrestricted competition, host countries cannot appropriate in this case the full benefits of FDI. In this case of reswitching, side payments among to host countries may be required in order to get every country to participate.

In the above discussion, we focused on the consequences of restricting competition between countries that compete to attract FDI. However, the same conclusions would apply for the case of competition among subnational governments of a given country. As long as there is no reswitching, delegation of power on these matters to the federal government achieves the first best outcome for the subnational units.
References


