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Developing Countries in Competition for Foreign Direct Investment

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Why competition?

FDI **may** bring more to host countries than just additional financial capital:

- broader tax base
- increased employment
- enhanced management skills
- new technologies
- higher wages
- access to export markets, etc.

Benefits from FDI depend on types of investment and on host countries' policies.

These effects are especially important in the context of economic development → reason why countries engage in competition for FDI

Question: When can a less developed country win in competition for FDI?

Some implications from empirical research

Intensity of the competition for FDI has increased as a consequence of fallen barriers to international investment, and of reduced importance of market size due to globalization of the world economy.

Tax incentives are one of the main instruments for attracting FDI, but they cannot compensate for all drawbacks of some competing country.

The most important other factors considered by the investors:

- predictable and non-discriminatory regulatory environment and an absence of excessive administration (including transparent public sector and effective system of courts and law enforcement).
- stable macroeconomic environment (including access to international trade).
- sufficient and accessible resources (relevant infrastructure and human capital).

→ Policies to influence investors' decision without giving subsidies.

Fiscal policy tools

Competing countries can influence FDI flows up to a certain level by using fiscal policy instruments as strategic tools.

Tax incentives and/or higher supply of public inputs?

Both of these policies need to be financed by a higher tax burden on (domestic) producers → the use of public resources for tax incentives tends more to compete than to augment the use of public resources for providing additional public inputs.

However, while only foreign company benefits from tax incentives, additional public inputs increase the output of domestic companies as well.

One needs to model the competition for FDI in which governments may choose between these two instruments.

Asymmetric countries I

Most of the models on tax competition, and on competition for FDI are in symmetric settings → the results do not say anything about the allocation of FDI among countries at different stages of development.

Countries are different in respect to many aspects which are important for location decision of foreign investor (FI):

- market size (market access, transportation costs)
- intensity of competition
- wages or other production costs
- available infrastructure (physical and institutional) + human capital

Asymmetric countries II

The attractiveness of a country as an investment location increases, *ceteris paribus*, with:

a) larger market (better market access)
b) lower intensity of competition on local markets
c) lower wages/production costs
d) higher supply of public inputs (infrastructure…)

(a & b – sufficiently explored– this paper concentrates on c & d).

Can it be stated in advance that, according to above criteria, developing countries are more attractive for foreign investors?

Developing countries' markets are usually smaller, but with lower intensity of competition.

Also, the wages in developing countries are lower, but the supply of relevant infrastructure and other public inputs is smaller.

Determinants of optimal policy toward FDI

The situation without FDI can be described as **initial income**.

Income with FDI must be compared with the **initial income** in order to define **net gains from FDI**.

Country can offer e.g. subsidies to foreign investor as long as the **net gain from FDI** is positive, which defines a country's **maximal bid**.

In situation with asymmetric countries, **initial income** as well as the **maximal bid** of individual countries will normally differ.

With a possibility of increasing the supply of public inputs along/instead offering tax subsidies → **maximal bid** is not to be understood as maximal subsidy, but as **best possible conditions for FI** given the **positive net gain from FDI**.

Assumptions of the model

Two countries compete for a single FDI.

FI will invest in the country in which he makes higher profits.

Markets of two countries, as well as of the rest of the world are assumed to be perfectly integrated with tariffs and transportation costs equal to zero.

Domestic companies in two countries produce a homogenous product for which there is an exogenously given demand.

Domestic firms are price takers on the world market, which is separate from the market of foreign investor.

Governments use capital tax to finance their expenditure (public inputs and/or subsidies) and they must run balanced budget.

There is an employment creation effect due to FDI (in both countries) and no spillover effects.

Competing economies and differences I

There are *n* companies in each competing economy, engaged in perfect competition (*n* is normalized to 1).

They produce a single good and their technology is described by the production function with three arguments: capital, labor and public inputs:

$$F(K, L, G) = g(G)\min(K, L)$$

with positive first, and negative second derivative of g(·) and the assumption that capital is the limiting factor in the production of domestic firms.

In addition, the analysis starts with assumption of an administrative minimum wage causing unemployment and an infinite labor supply at minimum wages denoted with *w*.

Competing countries and differences II

Domestic firms are not mobile, i.e. the capital employed in these companies represents an immobile tax base.

The only difference between countries is that local producers in more developed country use more capital in the production, i.e. that:

$$K_H > K_U$$

where *H* stands for high developed country and *U* for underdeveloped country.

The above inequality leads to: $L_H > L_U$

It is also assumed that: $w_H > w_U$

Government

Government levies capital tax in order to finance the supply of public inputs:

$KT = G$ with $G, T \geq 0$

where T denotes tax rate.

Government maximizes its residents' real disposable income denoted by W:

$$W = F(K, L, G) - KT = g(G)K - KT$$

Optimality condition without FDI is: $\partial g / \partial G = 1/K$

The above condition defines: $T = \overline{T}$, $G = \overline{G}$ and $W = \overline{W}$

Without FDI, there is higher supply of public inputs and higher income in high developed country.

Foreign investor

The profit of FI is given by:

$$\Pi = F^m(K^m, L^m, G) - L^m w - K^m(r + T^m)$$

with $F^m(K^m, L^m, G) = h(G)\min[K^m, L^m] = h(g)K^m$

and $\partial h/\partial G > 0, \quad \partial^2 h/\partial G^2 < 0$

where K^m and L^m stand for capital and labor employed by the FI, T^m is the tax rate for FI, and *r* is exogenous cost of capital.

The residents' income with FDI equals:

$$W = g(G)K - KT + L^m w$$

But now there is a possibility of tax discrimination and we have:

$$KT + K^m T^m = G$$

Two regimes will be analyzed: without and with tax discrimination.

Case without tax discrimination

Using only single tax rate, applicable to all companies the government maximizes residents' disposable income, subject to:

- non-negative supply of public inputs
- profit of FI must be higher than in other country
- there is a non-negative net gain from FDI,

Formally: $\max_{T} W = g(G)K - KT + L^m w$

s.t.

$$G = (K + K^m)T \geq 0$$

$$\Pi \geq \tilde{\Pi}$$

$$W \geq \overline{W}$$

cont.

In the situation with FDI there is a new optimal supply of public inputs determined by the following condition:

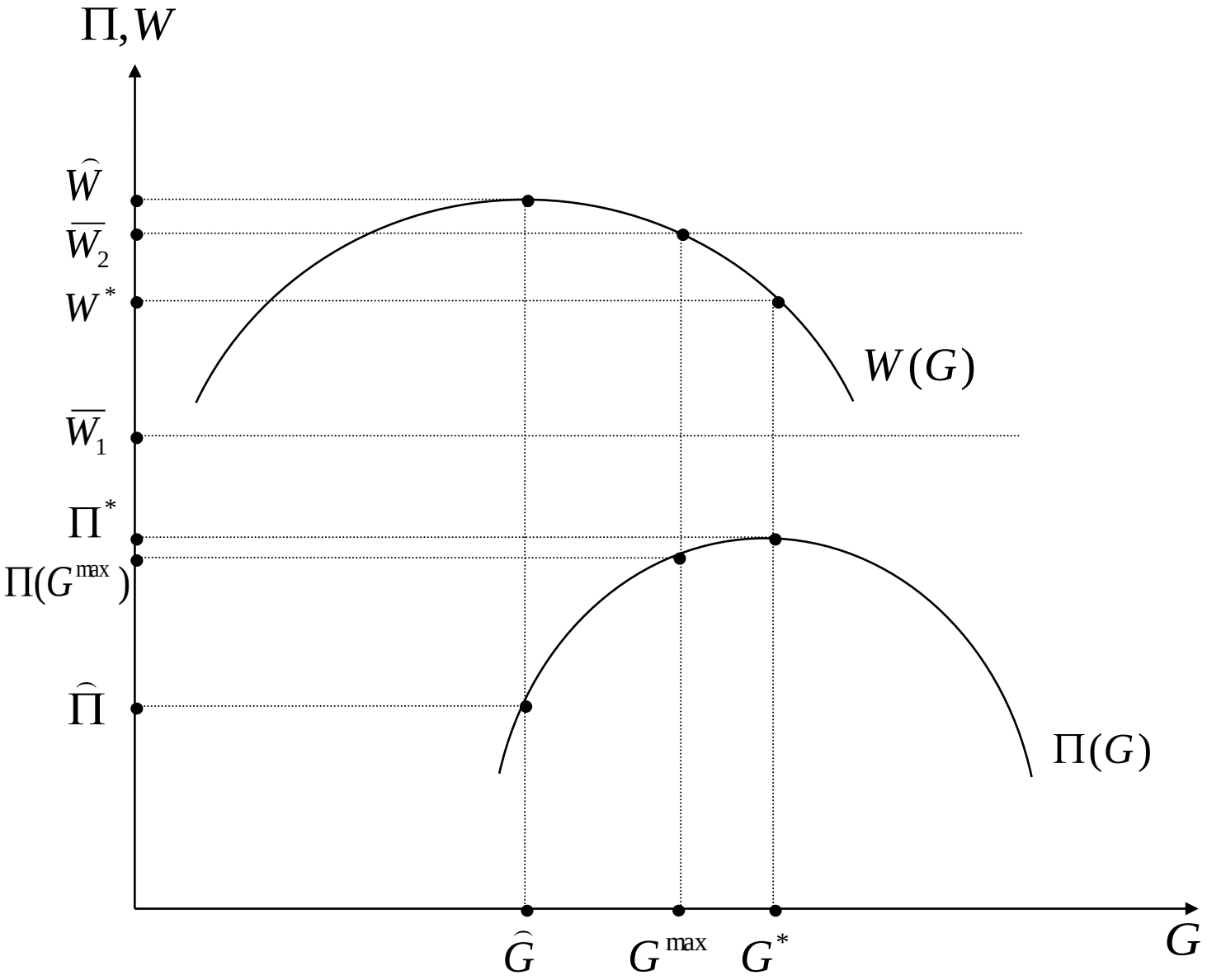
$\partial g/\partial G = 1/(K + K^m)$, which defines $\hat{T}, \hat{G}$ and $\hat{W}$

However, from the perspective of FI, the optimal supply of public inputs must fulfill the following condition:

$\partial h/\partial G = 1/(K + K^m)$, which defines T^*, G^* and W^*

This amount of public inputs is denoted by G^* and it may, or may not be attainable for competing countries.

This depends on whether: $W^* \geq \overline{W}$.


Π,W
$\widehat{W}$
$\overline{W}_2$
W^*
$W(G)$
$\overline{W}_1$
Π^*
$\Pi(G^{max})$
$\widehat{\Pi}$
$\Pi(G)$
$\widehat{G}$
G^{max}
G^*
G

The competition

Strategy spaces are:

$G \in [\widehat{G}, \min(G^{max}, G^*)]$ for $G^* > \widehat{G}$ and

$G \in [\widehat{G}, \max(G^{min}, G^*)]$ for $G^* < \widehat{G}$

Best response functions are:

set $G_U(\Pi_H)$ s.t. $\Pi_U(G_U) = \Pi_H(G_H) + \varepsilon$

set $G_H(\Pi_U)$ s.t. $\Pi_H(G_H) = \Pi_U(G_U) + \varepsilon$

Less developed country wins if: $\Pi_U(G_U) > \Pi_H(G_H^*)$

or, if G^* is not attainable when: $\Pi_U(G_U) > \max(\Pi_H(G_H^{max}), \Pi_H(G_H^{min}))$

Which country wins?

If G^* is attainable for both countries, the difference between foreign investor's profit in two countries equals:

$$\Pi_H^* - \Pi_U^* = [h(G_H^*)K^m - h(G_U^*)K^m] - (T_H^* K^m - T_U^* K^m) - (L^m w_H - L^m w_U)$$

In the case without tax discrimination and with attainable G^*:

- if wages were equal in both countries, the high developed country would always receive the investment;
- the underdeveloped country will receive the investment if the difference in wages between two countries is sufficiently high:

$$L^m w_H - L^m w_U > [h(G_H^*)K^m - h(G_U^*)K^m] - (T_H^* K^m - T_U^* K^m)$$

An implication and the role of public inputs

Less developed country has better chances of winning in the case of labor intensive project → greater difference in labor costs, while other variables are not affected.

In the absence of taxes (with *G* being some exogenous variable that cannot be affected by the policy), less developed country wins if:

$$h(\overline{G}_H)K^m - h(\overline{G}_U)K^m < (L^m w_H - L^m w_U)$$

If following inequality holds:

$$h(\overline{G}_H)K^m - h(\overline{G}_U)K^m > [h(G_H^*)K^m - h(G_U^*)K^m] - (T_H^* K^m - T_U^* K^m)$$

then consideration of public inputs may increase the less developed country's chances of winning the FDI.

Case with tax discrimination

Maximization problem is:

$$\max_{T,T^m} W = g(G)K - KT + L^m w$$

s.t.

$$G = KT + K^m T^m$$

$$\Pi \geq \tilde{\Pi}$$

$$W \geq \overline{W}$$

$$KT + K^m T^m \geq 0$$

Optimal supply of public inputs

In the situation with FDI, the optimal supply of public inputs is **always higher than in a regime without FDI**.

The optimal supply of public inputs (denoted by $\hat{G}$) is defined by the following condition:

$$(\partial g/\partial G)K + (\partial h/\partial G)K^m = 1$$

However, the above condition does not define individual tax rates for domestic and foreign companies. Rearranging the first order conditions of the maximization problem yields:

$$\hat{T}^m = (h(\hat{G})K^m - K^m r - L^m w - \tilde{\Pi}) / K^m$$

$$\hat{T} = (\hat{G} - h(\hat{G})K^m + K^m r + L^m w + \tilde{\Pi}) / K$$

$$\hat{W} = g(\hat{G})K - \hat{G} + h(\hat{G})K^m - K^m r - \tilde{\Pi}$$

Implications and the competition

From above equations it can be seen that residents income with FDI, as well as the tax rate on foreign capital, is negatively related to profit that foreign investor can make in the other country.

The opposite holds for tax rate on domestic capital.

The strategy spaces are $T, T^m \in R$ and $G \in R^+$ such that government's budget is balanced.

The best response functions are:

set $G_U = \hat{G}_U$ and set $T_U^m(\Pi_H) = \hat{T}_U^m$ s.t. $\Pi_U(\hat{G}_U, \hat{T}_U^m) = \Pi_H(G_H, T_H^m) + \varepsilon$

set $G_H = \hat{G}_H$ and set $T_H^m(\Pi_U) = \hat{T}_H^m$ s.t. $\Pi_H(\hat{G}_H, \hat{T}_H^m) = \Pi_U(G_U, T_U^m) + \varepsilon$

Which country wins?

From the condition of non-negative net gains from FDI, it is possible to find expression for maximal subsidy, which can be plugged into FI s profit function to express the maximal profit that FI can make:

$$\Pi^{\max} = h(\overline{G})K^m + \Delta F^m + \Delta F - \Delta G - K^m r$$

with:

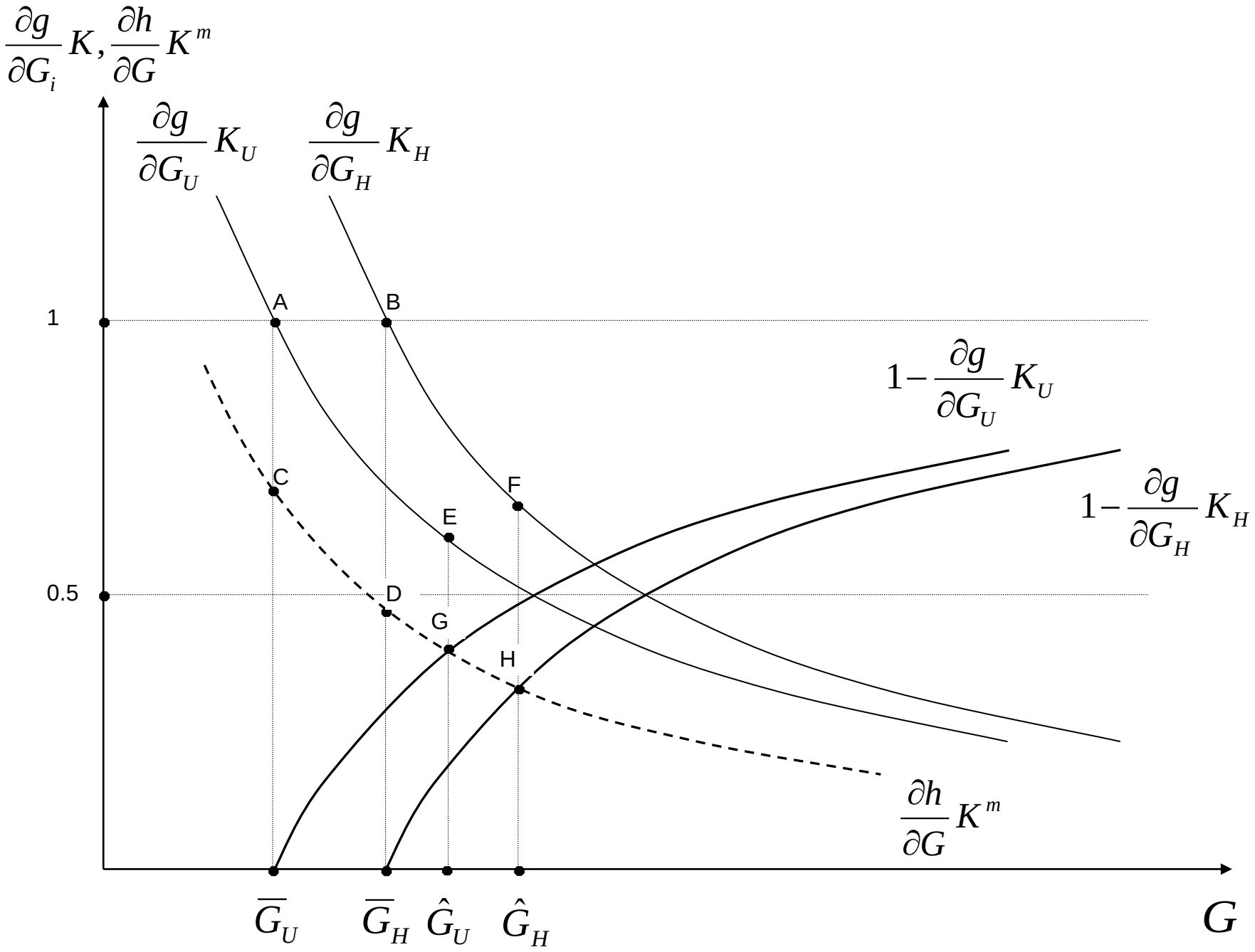
$$\Delta F^m = h(\hat{G})K^m - h(\overline{G})K^m$$

$$\Delta F = g(\hat{G})K - g(\overline{G})K$$

$$\Delta G = \hat{G} - \overline{G}$$

FI's decision is determined by the sign of the following expression:

$$\Pi_H^{\max} - \Pi_U^{\max} = h(\overline{G}_H)K - h(\overline{G}_U)K + \Delta F_H^m - \Delta F_U^m + \Delta F_H - \Delta F_U - (\Delta G_H - \Delta G_U)$$


$\frac{\partial g}{\partial G_i}K, \frac{\partial h}{\partial G}K^m$
$\frac{\partial g}{\partial G_U}K_U$
$\frac{\partial g}{\partial G_H}K_H$
1
0.5
A
B
C
D
E
F
G
H
$1-\frac{\partial g}{\partial G_U}K_U$
$1-\frac{\partial g}{\partial G_H}K_H$
$\frac{\partial h}{\partial G}K^m$
$\overline{G}_U$
$\overline{G}_H$
$\hat{G}_U$
$\hat{G}_H$
G

Solution

It turns out that high developed country always wins the investment with tax discrimination.

The reason is that wage rates do not play any role here, since additional labor cost for the FI is equal to additional gains from FDI for the government, so that high developed country can compensate this difference in labor costs to FI.

This is not changed even in the set up with labor markets clearing wages, i.e. without administrative minimum wages creating unemployment.

If labor supply curve is upward sloping, the assumption of cleared labor markets increases the chance of less developed country winning the investment, in the case without tax discrimination.

Conclusions

Without tax discrimination, less developed country can win the FDI if wage differential is sufficiently high and depending on the responsiveness of foreign and domestic companies (affecting attainability) to changes in the supply of public inputs.

Including public inputs in the model may increase the chances of less developed country, as compared to considering another location determinant that cannot be affected by policy.

In each case, without tax discrimination, the chances of less developed country are better with labor intensive FDI.

If tax discrimination is permitted, both countries optimally raise the supply of public inputs, but high developed country always wins the investment.

Qualitatively, the results do not change if cleared labor markets are assumed instead of administrative minimal wages causing unemployment (unless some domestic companies are forced to exit the market).

Implications

Governments of less developed countries may have an incentive to work on an international agreement to disallow tax discrimination, i.e. subsidies, unless they are convinced that the gain from FDI in their countries is sufficiently higher than in high developed countries and that this difference is not reflected in different costs for foreign investor.

Such measure is not identical to abolishing tax competition for FDI in general. Even if governments are not allowed to discriminate, they may still deviate from their optimal taxation and supply of public inputs in order to attract FDI as long as the residents' income with FDI exceeds their income without FDI.

Theory on competition for FDI and related empirical research shows that public policy matters for the location decision of investors .

Fiscal policy could have "kept" more capital in the developed world by using subsidies, than the neoclassical theory would predict if fiscal policy were neglected.

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