Lecture 10. Foreign Direct Investment and Multinational Firms

Basic concepts

Two concepts of FDI:
- Factor movement - Capital flows/stocks (balance of payments statistics)
- Transfer of Control - Ownership issue, No capital transfer necessary (sales)

For example, Graham (1992) defines FDI in the following way:
“Foreign Direct Investment occurs when citizens of one nation (the home country) acquire managerial control of economic activities in some other nation (the host country”).

IMF (1993)/OECD (1996) definition:
“FDI is an investment in a foreign company where the foreign investor owns at least 10% of ordinary shares, undertaken with the objective of establishing a “lasting interest” in the country, a long-term relationship and significant influence on the management of the firm. FDI includes equity capital, reinvested earnings and other direct investment capital”.
Foreign direct investment can take two basic forms:

- Greenfield investment
- Mergers and acquisitions

A multinational enterprise (MNE) is defined as a firm that owns and controls productive assets located in more than one country.

For example, Caves (2007) defines a multinational enterprise in the following way: “The multinational enterprise (MNE) is defined as an enterprise that controls and manages production establishments – plants – located in at least two countries”.

Problems with defining:
- Production establishments (“minimum plant abroad”)
- Minimum level of control (what constitutes control?)

UNCTAD (2001):
Transnational corporation (TNC) – enterprise that consists of the parent firm that controls units located abroad (At least 10% of ordinary shares):
- branches - 100 % shares.
- Subsidiaries – At least 50 %
- Associates – more than 10 % but less than 50 %
Possible linkages between the parent firm and the foreign subsidiary

Host Country I  Home Country  Host Country II

- Horizontal Integration

- Vertical Integration
- Complex Integration
Stylized facts on FDI

Country characteristics:

- FDI has grown rapidly throughout the world in the late 1980 and 1990s.
- Developed countries not only account for overwhelming proportion of outward FDI but are also the major recipients of FDI.
- Two-way FDI flows are common between pairs of developed countries even at the industry level (similarity with intra-industry trade).
- Most FDI appears to be horizontal as most output of foreign affiliates is sold in the foreign country.
- A significant percentage of world trade (1/3) is now intra-firm trade.
- There is substantial evidence that trade and FDI are complements and not substitutes.
- Little evidence exists that FDI is positively related to differences in relative capital endowments, or alternatively to differences in the general return to capital.
- Skilled-labor endowments are strongly and positively related to outward direct investment.
- Political risk and instability seems to be an important deterrent to inward FDI while taxes appear to be of second-order importance.
Firm and industry characteristics

• Large differences exist cross industries in the degree to which production and sales are accounted for by multinationals
• Multinationals tend to be important in industries and firms that: i) have high levels of R&D relative to sales, ii) employ a large number of professional and technical workers as a percentage of their total workforce, iii) produce new and/or technically complex products, iv) have high levels of product differentiation and advertising.
• Multinationals tend to be firms in which the value of the firm’s intangible assets is large relative to its market value
• Limited evidence suggests that plant-level scale economies are negatively associated with multinationality
• There seems to be a threshold size for multinationals, but above that level corporate size is not important.
• Corporate age is highly correlated with multinationality.
• There is evidence that FDI is positively related to transport costs and trade barriers.
FDI in neoclassical trade models

Neoclassical analysis of FDI is based on the following assumptions:

- Homogenous firms (same technology)
- Homogenous products
- Perfect competition
- Constant returns to scale

MacDougall (1960) 1 sector model of international capital flows

= a part of the portfolio theory of FDI, capital moves between countries until rates of return on capital are equalized.

Basic assumptions:

1 sector producing homogenous good Y (GDP)
2 non-specific (general use) factors: capital K, labor L
2 countries: home H (capital abundant) and foreign F (labor abundant)

Concentrate first on the host country and then study the joint impact of the capital flows.
Figure 1. The effects of capital inflow in the host country
Suppose there is capital inflow to the host country represented by $\Delta K$ so that the amount of capital available in the host country increases by $\Delta K$ to $K_1 = K_0 + \Delta K$.

As a result of the capital inflow GDP in the host country increases. By how much? The area under the MPK curve (sum of areas 1 and 2), i.e.:

$$\Delta Y = \int_{K_0}^{K_1=K_0+\Delta K} F_K(K, L) dK$$

Owners of foreign capital in the host country will receive the reward $r_1 \Delta K$ that will be transferred to the home country (area 2) so the gain to the host country will be equal to the difference between $\Delta Y$ and $r_1 \Delta K$ (area 1), i.e. it is the extra reward that goes to workers in the host country (the increase in their wages as the number of workers $L$ remains unchanged).

To see this let us discuss distribution of income within the host country as a result of the capital inflow from abroad. Domestic capitalists in the host country lose as a result of capital inflow from abroad. Their loss is equal to $(r_0 - r_1)K_0$ (area 3). This loss can be interpreted as a transfer to workers. (Remember that the inflow of capital from abroad raises the marginal product of labor and wages in the host country!)
The total increase in the wage bill in the host country equals the area 1+3. How do we know this?

\[
\Delta Y = Y_1 - Y_0 = w_1 L_0 + r_i (K_0 + \Delta K) - w_0 L_0 - r_0 K_0 = (w_1 - w_0) L_0 + \frac{r_i}{1} K_0 + \frac{r_0}{2} \Delta K = 1 + 2
\]

\[
\Delta Y = 1 + 2 = (w_1 - w_0) L_0 - 3 + 2
\]

\[
(w_1 - w_0) L_0 = 1 + 3
\]

Now, we need to determine how much capital will move from the home to the foreign country. In MacDougall model capital moves between countries until rates of return on capital are equalized.

The international equilibrium can be represented graphically.
Figure 2. International equilibrium in the MacDougall model.
The effects of capital inflow to the host (foreign) country:

Increase in GDP by amount: $\Delta Y^F = \int_{K_G}^{K_G+\Delta K} F_K(K,L)dK \text{ (area } A+B+C+D)\text{)

Owners of foreign capital receive: } r_1dK \text{ (area } B+C+D) \text{ (which is transferred to the home country).

Workers employed in “multinational firms” receive: } \Delta Y^F - r_1dK \text{ (area } A) \text{ = net gain for the host country.

Income redistribution effect (area E).

The reward to capital in the host country falls by $(r_o^F - r_1)K_F$ as a result of capital inflow from abroad = loss of local owners of capital (area E), however this loss is compensated by an increase in wages of workers employed in local firms by the same amount (transfer of income from capitalists to workers)

$\Delta Y^F = \text{ area } (A+B+C+D) = (w_1^F - w_0^F)L_0^F - \text{ area } (E) + \text{ area } (B+C+D)$

hence $(w_1^F - w_0^F)L_0^F = \text{ area } (A+E)$

Net Effect: positive = area (A)
The effects of capital outflow from the home country:

GDP falls, but GNP increases (area B)

Owners of capital receive extra income: area (C + B + F)
Workers receive lower wage bill: area (C + F)
Net Effect: positive = area (B)

Transfer of income from workers to capitalists in the home country as a result of FDI.

Although FDI is beneficial for both countries, however, there are income redistribution effects as a result of capital flows.
Mundell (1957) 2 sector model of international capital flows

Heckscher-Ohlin model with international capital mobility. Capital flows are viewed as a substitute to international trade leading to factor price equalization between countries.

Basic assumptions:
2 sectors producing homogenous goods: X (capital-intensive) i Y (labor-intensive)
2 non-specific factors: capital K, labor L
2 countries: home H (capital abundant) and foreign F (labor abundant)

Trading equilibrium
Assume that differences in relative factor endowments are not very large so that there is incomplete specialization in production and factor price equalization through international trade (start inside the factor price equalization cone). In this case the unit factor requirements are fixed and the same in both countries (equivalent to the Leontief production function).

The full employment conditions in the host country can be written as follows:

\[ a_{KX}X + a_{KY}Y = K \]
\[ a_{LX}X + a_{LY}Y = L \]

\( a_{ij} \) – unit factor requirement i in sector j, i = K, L; j = X, Y; and \( a_{KX}/a_{LX} > a_{KY}/a_{LY} \).
**FDI equilibrium**

Now, assume that the host country imposes a prohibitive tariff on the imports of capital intensive product X to promote its domestic production. This raises the relative price of the capital-intensive good, hence the reward to capital in the host country increases which encourages the capital inflow from abroad. Eventually, the rates of return to capital will be equalized.

In the capital importing country the Rybczyński effect will take place, production of X will increase and production of Y will decrease. Eventually, the country will reach self-sufficiency in X and imports of X will be eliminated. The tariff on X will lose its importance (although still in place).

The effects of capital inflow to the host country can be illustrated graphically. Recall, that an increase in the capital stock changes the PPF (a shift in the Rybczyński line).

Rybczyński lines for capital and labor can be obtained from the full employment conditions:

\[
Y = \frac{K}{a_{KY}} - a_{KX} \frac{X}{a_{KY}}
\]

\[
Y = \frac{L}{a_{LY}} - a_{LY} \frac{X}{a_{LY}}
\]
Figure 3. The effects of capital inflow to the host country in the Mundell model
Figure 4. The international capital flows in the Mundell model.
Caves (1971) 2 sector factor specific model of international knowledge flows

Allows differentiation between the FDI and portfolio investment. A stepping stone in modeling FDI which until then were identified with international capital flows. Although still based mostly on neoclassical assumptions the model shows that for FDI no foreign capital inflow is necessary. What really matters is the international transfer of productive knowledge that may but does not have to be accompanied by the capital inflow.

**Basic assumptions:**
2 sectors producing homogenous goods: X (capital-intensive) i Y (labor-intensive)
3 factors of production: 2 non-specific factors: capital K, labor L, one specific factor: knowledge capital S
2 countries: home H (capital abundant) and foreign F (labor abundant)

The effects of FDI in this model are ambiguous and depend on:

- The differences in capital intensity between sectors
- The amount of capital transfer from abroad
- The extent of foreign knowledge diffusion among the indigenous firms in the host country
Production functions are represented by:

\[
X = F(K_X, L_X, S) \quad \text{the foreign sector}
\]

\[
Y = g(S)G(K_Y, L_Y) \quad \text{the local sector}
\]

FOCs:

\[
\Pi_X = p_X X - w_X L_X - r_X K_X - F
\]

\[
\hat{\Pi} = p_X X S - F
\]

FOCs:

\[
\Pi_Y = p_Y Y - w_Y L_Y - r_Y K_Y
\]

Normalize: \( p_X = p_Y = 1 \)
Perfect capital and labor mobility conditions:

\[ w_X = w_Y = w = X_L(K_X, L_X, S) = Y_L(K_Y, L_Y) \]
\[ r_X = r_Y = r = X_K(K_X, L_X, S) = Y_K(K_Y, L_Y) \]

Full employment conditions:

\[ K_X + K_Y = \bar{K} \]
\[ L_X + L_Y = \bar{L} \]
\[ S = \bar{S} \]

Differentiate totally the full employment conditions and write them in the matrix form:

\[
\begin{bmatrix}
[F_{KK} + g(S)G_{KK}] & [F_{KL} + g(S)G_{KL}] \\
[F_{LK} + g(S)G_{LK}] & [F_{LL} + g(S)G_{LL}]
\end{bmatrix}
\begin{bmatrix}
dK_X \\
dL_X
\end{bmatrix} =
\begin{bmatrix}
\lambda g(S)G_{KK} + g'(S)G_K - F_{KS} \\
\lambda g(S)G_{LK} + g'(S)G_L - F_{LS}
\end{bmatrix}
dS
\]

Assume that the transfer of specific capital can be accompanied by the inflow of physical capital, i.e. \( dK/dS = \lambda > 0 \).
Now look at the changes in the allocation of factor of production between sectors and wages:

\[
\frac{dK_X}{dS} = \frac{g'(S)\{G_K [F_{LL} + g(S)G_{LL}] - G_L [F_{KL} + g(S)G_{KL}]\}}{\Delta} > 0
\]

\[
\frac{dL_X}{dS} = \frac{g'(S)\{G_L [F_{KK} + g(S)G_{KK}] - G_K [F_{KL} + g(S)G_{KL}]\}}{\Delta} < 0
\]

\[
\frac{dw}{dS} = \frac{A(k_Y - k_X)}{\Delta} < 0 + \frac{\lambda g(S)G_{KL} (F_{KK} F_{LL} - F_{KL}^2)}{\Delta} > 0
\]

\[
g'(S)\{G_L (F_{KK} F_{LL} - F_{KL}^2) + B[F_{KL} (k_X - k_Y) + F_{LS} S / L_X]\} \Delta < 0
\]
The impact of FDI on national income in the host country

\[
\frac{dI}{dS} = g'(S)G(\cdot) - \frac{dr}{dS} K_{\text{foreign}} - \frac{dF_s}{dS} = 0 \quad S > 0
\]