Lecture 14

Multinational Firms

1. Review of empirical evidence

2. Dunning's OLI, joint inputs, firm versus plant-level scale economies

3. A model with endogenous multinationals

4. Pattern of trade in goods and services

5. Motives for internalization

6. A model of internalization
Firm and Industry Characteristics

(1) Multinationals are associated with high ratios of R&D relative to sales.

(2) Multinationals employ large numbers of scientific, technical, and other "white collar" workers as a percentages of their work forces.

(3) Multinationals tend to have a high value of "intangible assets"; roughly, market value minus the value of tangible assets such as plant and equipment.

(4) Multinationals are associated with new and/or technically complex products.

(5) Evidence suggests that multinationality is negatively associated with plant-level scale economies.

(6) Multinationals are associated with product-differentiation variables, such as advertising to sales ratios.

(7) A minimum or "threshold" level of firm size seems to be important for a firm to be a multinational, but above that level firm size is of minimal importance.
Multinationals tend to be older, more established firms.

**Country Characteristics**

1. The high-income developed countries are not only the major source of direct investment, they are also the major recipients. Most direct investment seems to be horizontal.

2. There has been a major boom of direct investment into the developing countries in the 1990s, but most of it has gone to the more advanced LCDs and to China. Little goes to the least developed countries.

3. Direct investment stocks have grown significantly faster than trade flows over the last two decades, even though trade barriers have fallen dramatically.

4. High volumes of direct investment are associated with similarities among countries in terms of relative factor endowments and per capita incomes, not
(5) A high volume of outward direct investment is positively related to a country's endowment of skilled labor and insignificantly or negatively related to its physical capital endowment.

(6) There is little evidence that direct investment is primarily motivated by tariff avoidance or measurable transport costs,

(7) There is mixed evidence that tax avoidance and/or risk diversification are important motives for direct investment. Some evidence does suggest that political risk discourages inward investment.

(8) Infrastructure, skill levels, and a minimum threshold level of per capita income seem to be very important determinants of direct investment.

(9) There is evidence that agglomeration effects are important in direct investment. But it is admittedly difficult to distinguish agglomeration effects from firms being drawn to the same (unobserved) site-specific resources.
Table 1

Annual growth rate (%), all countries

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>FDI inflows</td>
<td>24.7</td>
<td>20.0</td>
<td>31.9</td>
</tr>
<tr>
<td>FDI stocks</td>
<td>18.2</td>
<td>9.4</td>
<td>16.2</td>
</tr>
<tr>
<td>Sales of foreign affiliates</td>
<td>15.8</td>
<td>10.4</td>
<td>11.5</td>
</tr>
<tr>
<td>Gross product of foreign affiliates</td>
<td>16.4</td>
<td>7.1</td>
<td>15.3</td>
</tr>
<tr>
<td>Royalties and fees receipts</td>
<td>22.0</td>
<td>14.2</td>
<td>3.9</td>
</tr>
<tr>
<td>GDP at factor cost</td>
<td>11.7</td>
<td>6.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Gross fixed capital formation</td>
<td>13.5</td>
<td>5.9</td>
<td>-1.4</td>
</tr>
<tr>
<td>Exports of goods and non-factor services</td>
<td>15.0</td>
<td>9.5</td>
<td>1.5</td>
</tr>
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</table>
Table 2

FDI inflows and outflow, share in total

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed in</th>
<th>Developed out</th>
<th>Developing in</th>
<th>Developing out</th>
<th>CEE in</th>
<th>CEE out</th>
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<tbody>
<tr>
<td>1983-1987</td>
<td>76</td>
<td>95</td>
<td>24</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1988-1992</td>
<td>78</td>
<td>93</td>
<td>21</td>
<td>7</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1993</td>
<td>62</td>
<td>85</td>
<td>35</td>
<td>15</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1994</td>
<td>59</td>
<td>83</td>
<td>39</td>
<td>17</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1995</td>
<td>65</td>
<td>85</td>
<td>32</td>
<td>15</td>
<td>4</td>
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</tr>
<tr>
<td>1996</td>
<td>58</td>
<td>85</td>
<td>38</td>
<td>15</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1997</td>
<td>58</td>
<td>86</td>
<td>38</td>
<td>14</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1998</td>
<td>71</td>
<td>95</td>
<td>26</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1999</td>
<td>74</td>
<td>91</td>
<td>24</td>
<td>8</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: UNCTAD World Investment Report, 2000 and earlier years
Point of Departure for Theory: Firms incur significant costs of doing business abroad relative to domestic firms in those countries.

Therefore, for a firm to become a multinational, it must have offsetting advantages.

Dunning (OLI): There are three necessary conditions for firms to be willing to undertake investments abroad

Ownership Advantage: the firm must have a product or a production process such that the firm enjoys some market power advantage in foreign markets.

Location Advantage: the firm must have a reason to want to locate production abroad rather than concentrate it in the home country, especially if there are scale economies at the plant level.

Internalization Advantage: the firm must have a reason to want to exploit its ownership advantage internally, rather than license or sell its product/process to a foreign firm.
Ownership Advantages, Firm-Specific Assets, and Knowledge Capital

Multinationality related to R&D, marketing, scientific and technical workers, product newness and complexity, product differentiation.

MNEs intensive in knowledge capital, knowledge-based assets
1. services of knowledge capital easily transported to distant plants
2. joint input or "public goods" nature of knowledge capital.

Physical capital intensity by itself should not give rise to multinationality.

What is being traded? Multinationals are exports of the services of knowledge-based assets: managerial and engineering services, financial services, reputations and trademarks.
Location advantages.

Horizontal multinationals producing the same goods and services in each location: Large markets and high trade costs.

Vertical multinationals geographically fragmenting the production process by stages: factor-price differences across countries are linked to the factor intensities of different stages, low trade costs.

Internalization advantages.

The same joint-input, public-goods property of knowledge that makes it easily transferred to foreign locations makes it easily dissipated. Firms transfer knowledge internally in order to maintain the value of assets and prevent dissipation.
Here are the principal elements of a single-firm model.

There are two countries, i and j.

There are two goods, $X$ and $Y$.

There is one factor of production, $L$.

$Y$ is produced with constant returns by a competitive industry in both countries.

$X$ is produced by a single firm, headquartered in country i. Country j does not produce good $X$.

The $X$ firm can have either
  a single plant in country i: a type-d (domestic or national) firm,
  plants in both countries: a type-h (horizontal multinational) firm, or
  a single plant in country j: a type-v (vertical multinational) firm.

Markets are segmented so that the $X$ firm can price independently in the two markets without threat of arbitrage.
Double subscripts are used for $X$ and $Y$, with the first indicating the country of production and the second the country of consumption. $X_{ii}$ is the amount of $X$ produced and sold in country $i$, positive if the firm is type-d or h.

$X_{ij}$ is the amount produced in country $i$ and sold in $j$, positive only if the firm is type-d.

$X_{jj}$ is the amount produced and sold in country $j$, positive only if the firm is type-h or v.

$X_{ji}$ is the amount produced in country $j$ and sold in $i$, positive only if the firm is type-v.

\[ U_{mi} = \alpha (X_{ii}/L_i) - (\beta/2)(X_{ii}/L_i)^2 + (Y_{ii} + Y_{ji})/L_i \quad (1) \]

Aggregating across individuals, total utility in country $i$ is given by:

\[ U_i = L_i U_{mi} = \alpha X_{ii} - (\beta/2)X_{ii}^2/L_i + (Y_{ii} + Y_{ji}) \quad (2) \]
Production of $Y$ in country $i$ is given by a simple linear function.

$$Y_{ii} + Y_{ij} = \gamma L_{yi} \quad (3)$$

Let $Y$ be numeraire. The national budget constraint requires that the value of the labor endowment plus profits of the national firm ($\Pi_i$) equals consumption.

$$\gamma L_i + \Pi_i = p_i X_{ii} + (Y_{ii} + Y_{ji}) \quad (4)$$

The representative consumer:

$$\text{Max}(X) \quad U_i = \alpha X_{ii} - \left(\beta/2\right)X_{ii}^2/L_i + \gamma L_i + \Pi_i - p_i X_{ii} \quad (5)$$

Optimization yields a linear inverse-demand curve for $X$ with demand independent of income.

$$p_i = \alpha - \left(\beta/L_i\right)X_{ii} \quad (6)$$

Let $\Pi_{ii}$ denote profits for a domestic firm on domestic sales minus fixed costs. $c_i$
is the marginal cost of production, \( G \) is a plant-specific fixed cost, and \( F \) is a firm-specific fixed cost.

\[
\Pi_{ii} = p_t X_{ii} - c_t X_{ii} - G - F = [\alpha - (\beta/L_i)X_{ii}]X_{ii} - c_t X_{ii} - G - F (7)
\]

The first-order condition with respect to \( X_{ii} \) is:

\[
\frac{d\Pi_i}{dX_{ii}} = \alpha - 2(\beta/L_i)X_{ii} - c_i = 0 \tag{8}
\]

This gives equilibrium supply of \( X \) to the local market.

\[
X_{ii} = \frac{\alpha - c_i}{2\beta} L_i \tag{9}
\]

If the firm exports to country \( j \), its profit equation for export sales \( \Pi_{ij} \) (arbitrarily imputing fixed costs to the domestic profit equation (7)) is as follows.

\[
\Pi_{ij} = p_j X_{ij} - (c_i + t)X_{ij} = [\alpha - (\beta/L_j)X_{ij}]X_{ij} - (c_i + t)X_{ij} \tag{13}
\]
Maximization of (13) yields the equilibrium export supply.

\[ X_{ij} = \frac{\alpha - c_i - t}{2\beta} L_j \]  (14)

We can now summarize the total profits the firm would obtain from each of its three alternative modes of serving market j. Superscripts refer to types d, h, and v.

\[ \Pi_i^d = \Pi_{ii} + \Pi_{ij} = \beta \left[ \frac{\alpha - c_i}{2\beta} \right]^2 L_i + \beta \left[ \frac{\alpha - c_i - t}{2\beta} \right]^2 L_j - G - F \]  (16)

\[ \Pi_i^h = \Pi_{ii} + \Pi_{ij} = \beta \left[ \frac{\alpha - c_i}{2\beta} \right]^2 L_i + \beta \left[ \frac{\alpha - c_j}{2\beta} \right]^2 L_j - 2G - F \]  (17)

\[ \Pi_i^v = \Pi_{ji} + \Pi_{jj} = \beta \left[ \frac{\alpha - c_j - t}{2\beta} \right]^2 L_i + \beta \left[ \frac{\alpha - c_j}{2\beta} \right]^2 L_j - G - F \]  (18)
Figure 1: Relative Size Differences and Choice of Regime, the Base Case

- Type-d
- Type-h
- Type-v
Figure 11: Welfare Effect of a Production Tax in Country i (country i four times the size of country j)

Type-d firm  Type-h firm  Type-v firm

Production Tax in Country i

Welfare of Country i

Welfare of Country j

UI  UJ
Version 2:

There are two identical countries with one (potential) firm in each country. Each firm can choose between serving the foreign market by exports or by a branch plant.

Let $c = 0$ and $b = 1$ for simplicity.

$\Pi_i(a, b)$ equal the profits of firm $i$ when firm $i$ has $a$ plants and firm $j$ has $b$ plants.

\[
\Pi_i(2, 2) = 2 \left[ \frac{\alpha}{3} \right]^2 - 2G - F = \Pi_j(2, 2)
\]  

(23)

\[
\Pi_i(1, 1) = \left[ \frac{\alpha + t}{3} \right]^2 + \left[ \frac{\alpha - 2t}{3} \right]^2 - G - F = \Pi_j(1, 1)
\]  

(24)

\[
\Pi_i(2, 1) = \left[ \frac{\alpha}{3} \right]^2 + \left[ \frac{\alpha + t}{3} \right]^2 - 2G - F = \Pi_j(1, 2)
\]  

(25)
In the first stage of the game, each firm selects its number of plants: 0, 1, 2

In the second stage, the firms play a Cournot output game in each (segmented) market

We have just solved the second-stage problem, now the first stage: The normal form is:

\[
\Pi_i(1, 2) = \left[\frac{\alpha}{3}\right]^2 + \left[\frac{\alpha - 2t}{3}\right]^2 - G - F = \Pi_j(2, 1)
\]

\[
\Pi_i(2, 0) = 2\left[\frac{\alpha}{2}\right]^2 - 2G - F = \Pi_j(0, 2)
\]

\[
\Pi_i(1, 0) = \left[\frac{\alpha}{2}\right]^2 + \left[\frac{\alpha - t}{2}\right]^2 - G - F = \Pi_j(0, 1)
\]
<table>
<thead>
<tr>
<th>Firm i number of plants</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0, 0</td>
<td>0, $\Pi_j(0,1)$</td>
<td>0, $\Pi_j(0,2)$</td>
</tr>
<tr>
<td>1</td>
<td>$\Pi_i(1,0), 0$</td>
<td>$\Pi_i(1,1), \Pi_j(1,1)$</td>
<td>$\Pi_i(1,2), \Pi_j(1,2)$</td>
</tr>
<tr>
<td>2</td>
<td>$\Pi_i(2,0), 0$</td>
<td>$\Pi_i(2,1), \Pi_j(2,1)$</td>
<td>$\Pi_i(2,2), \Pi_j(2,2)$</td>
</tr>
</tbody>
</table>

Note that with full symmetry, if an off diagonal element $ij$ is a Nash equilibrium, then element $ji$ must be as well.

Here are some examples of how the equilibrium depends on key parameters.
Figure 3.1: Regime as a function of F and G (t = 3)

Region A: (1, 1), (2, 0), (0, 2)
Figure 3.3: Regime as a function of $F$ and $t$ ($G = 12$)

Region $A$: $(1, 1), (2, 0), (0, 2)$
Figure 3.6: Regime shift induced by an increase in country j's trade cost $t_{cj}$ ($t_{ci} = 1$), (1,1) to (2,1)
Figure 3.8: Regime shift induced by an increase in country j's trade cost $tc_j$ ($tc_i = 1$), (1,1) to (0,1)
The Knowledge-Capital Model:

A general-equilibrium approach that incorporates both horizontal and vertical motives for multinationals

Two goods, X and Y
Two factors, skilled and unskilled labor, S and L
Two countries i and j.

Y is produced with constant returns by a competitive industry and unskilled-labor intensive.

X is produced with increasing returns by imperfectly competitive firms. There are both firm-level and plant-level fixed costs and trade costs.

Firm level fixed costs result in the creation of “knowledge-based assets”. There are three defining assumptions for the knowledge-capital model.
(A) **Fragmentation**: the location of knowledge-based assets may be fragmented from production. Any incremental cost of supplying services of the asset to a single foreign plant versus the cost to a single domestic plant is small.

(B) **Skilled-labor intensity**: knowledge-based assets are skilled-labor intensive relative to final production.

(C) **Jointness**: the services of knowledge-based assets are (at least partially) joint ("public") inputs into multiple production facilities. The added cost of a second plant is small compared to the cost of establishing a firm with a local plant.

There are six possible firm “types” that can exist in equilibrium, and there is free entry an exist into and out of firm types.
Type $h_i$ - horizontal multinationals which maintain plants in both countries, headquarters is located in country i.

Type $h_j$ - horizontal multinationals which maintain plants in both countries, headquarters is located in country j.

Type $d_i$ - national firms that maintain a single plant and headquarters in country i. Type $d_i$ firms may or may not export to country j.

Type $d_j$ - national firms that maintain a single plant and headquarters in country j. Type $d_j$ firms may or may not export to country i.

Type $v_i$ - vertical multinationals that maintain a single plant in country j, headquarters in country i. Type $v_i$ firms may or may not export to country i.

Type $v_j$ - vertical multinationals that maintain a single plant in country i, headquarters in country j. Type $v_j$ firms may or may not export to country j.
Assumptions on the skilled-labor intensity of activities are:

\[
\text{Activities} \\
\text{[headquarters only]} > \text{[integrated X]} > \text{[plant only]} > \text{[Y]}
\]

When countries are similar in size and in relative endowments, horizontal firms will have the advantage over type-d or type-v.

When countries differ substantially in relative endowments, vertical firms will have an advantage over type-n firms, because they can locate the headquarters and plant independently on the basis of factor prices.

The greatest advantage occurs when the skilled-labor-abundant country is also small. The headquarters is placed in the skilled-labor-abundant country and the single plant is placed in the large unskilled-labor abundant country, serving the small country by exports.
I do not construct this type of model as a game, but as a complementarity problem due to the free entry and continuum of firms assumptions. We looked at this type of model earlier when we did a Cournot model with free entry.

There are:

MR = MC inequalities with complementary variables output, and

p = AC (or profits = zero) inequalities with complementary variables the number of firms of that type active in equilibrium.

The full model is thus a set of non-linear inequalities with associated non-negative complementary variables.
<table>
<thead>
<tr>
<th>Inequalities</th>
<th>Complementary Variable</th>
<th>Number of Inequalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>pricing inequalities</td>
<td>activity level</td>
<td>number</td>
</tr>
<tr>
<td>$q_i \leq c_{iy}$</td>
<td>$y_i$</td>
<td>2</td>
</tr>
<tr>
<td>$p_{ui} \leq c_{iu}$</td>
<td>$U_i$</td>
<td>2</td>
</tr>
<tr>
<td>$p_i(1 - m_{ii}^d) \leq c_i(w_i, z_i)$</td>
<td>$X_{ii}^d$</td>
<td>2</td>
</tr>
<tr>
<td>$p_j(1 - m_{ij}^d) \leq c_i(w_i, z_i)(1 + \tau)$</td>
<td>$X_{ii}^d$</td>
<td>2</td>
</tr>
<tr>
<td>$p_i(1 - m_{ii}^h) \leq c_i(w_i, z_i, w_j, z_j)$</td>
<td>$X_{ii}^h$</td>
<td>2</td>
</tr>
<tr>
<td>$p_j(1 - m_{ij}^h) \leq c_j(w_j, z_j, w_j, z_j)$</td>
<td>$X_{ij}^h$</td>
<td>2</td>
</tr>
<tr>
<td>$p_i(1 - m_{ii}^\nu) \leq c_j(z_i, w_j, z_j)(1 + \tau)$</td>
<td>$X_{ii}^\nu$</td>
<td>2</td>
</tr>
<tr>
<td>$p_j(1 - m_{ij}^\nu) \leq c_j(z_i, w_j, z_j)$</td>
<td>$X_{ij}^\nu$</td>
<td>2</td>
</tr>
</tbody>
</table>
\[ p_{jci}^k \leq f_{ci}^k \quad N_i^k \quad 6 \]

market clearing inequalities

\[ \sum_i \text{demand } Y_{ic} \leq \sum_i \text{supply } Y_i \quad q \quad 1 \]

\[ \text{demand } U_i \leq \text{supply } U_i \quad p_{ui} \quad 2 \]

\[ \text{demand } X_{jc} \leq \sum_{k,i} \text{supply } X_{ij}^k \quad p_j \quad 2 \]

\[ \text{demand } N_i^k \leq \text{supply } N_i^k \quad p_{jci}^k \quad 6 \]

\[ \text{demand } L_i \leq \text{supply } L_i \quad w_i \quad 2 \]

\[ \text{demand } S_i \leq \text{supply } S_i \quad z_i \quad 2 \]
The general-equilibrium model is thus solving 57 equations and inequalities for 57 unknowns.
Figure 8.1: Volume of affiliate production, investment liberalized, high trade costs (IL)
Figure 8.2: Volume of affiliate production, investment liberalized, low trade costs (FL)
Figure 8.3: Change in affiliate production when trade costs are reduced (IL to FL)
Internalization

General Idea: some of the same properties of knowledge capital that create ownership advantages create internalization advantages. These arise from the jointness property of knowledge along with moral hazard, asymmetric information, and the infeasibility of complete and/or enforceable contracts.

Some internalization models involving the stylized facts on knowledge capital, product newness and complexity.

(1) A firm is reluctant to reveal its product or process to a licensee, who may reject the proposal, but now has the knowledge. But the potential licensee is not going to sign an agreement without knowing what it is buying.

(2) The licensee knows that the firm may not have an incentive to truthfully reveal the product's quality.

(3) The newness of the product may create an informational asymmetry in the opposite direction: the potential licensee may have a much better idea of how the product will sell in its local market, while the MNE does not. The licensee
extracts rent to reveal the information.

(4) Bi-lateral uncertainty over stat-up problems, worker productivity and learning rates.

(5) Knowledge is easily learned by new employees. The licensee may be able to defect, starting a new firm in competition with the MNE.

(6) Product quality is an intangible asset. A licensee may have an incentive to reduce quality, capturing a short-run gain at the expense of losing the contract.

(7) Difficulties in choosing between costly monitoring and suffering the costs of moral hazard when employing licensees.

(8) Parties must make relation-specific investments (implies investments are sunk and cannot be used for other uses).

(9) Differences in objectives and goals between the firm and the licensee.
Elements of the Model (Markusen, JIE 2001)

(1) The MNE introduces (or attempts to introduce) a new product every second time periods. Two periods are referred to as a "product cycle". A product is economically obsolete at the end of the second period (end of the product cycle).

(2) The probability of the MNE successfully developing a new product in the next cycle is $1/(1+r)$ if there is a product in the current cycle, zero otherwise (i.e., once the firm fails to develop a new product, it is out of the game). The probability of having a product in the third cycle is $1/(1+r)^2$ etc. Ignore discounting.

(3) The MNE can serve a foreign market by exporting, or by creating a subsidiary to produce in the foreign market.

(4) Because of the costs of exporting, producing in the foreign country generates the most potential rents.

(5) But any local manager learns the technology in the first period of a cycle
and can quit (defect) to start a rival firm in the second period. Similarly, the MNE can defect, dismissing the manager and hiring a new one in the second period. The (defecting) manager can only imitate, not innovate and compete in the next product cycle.

(6) Initially, no binding contracts can be written to prevent either partner from undertaking such a defection.

(7) Initially, I will assume that the MNE either offers a self-enforcing contract or exports. The possibility that defection occurs as an equilibrium is allowed later in the paper.

(8) Notation is as follows.

R- Total per period licensing rents from the foreign country.

E- Total per period exporting rents ($E < R$).

F- Fixed cost of transferring the technology to a foreign partner. These include
physical capital costs, training of the local manager, etc.

T- Training costs of a new manager that the MNE incurs if it dismisses the first one (i.e., if the MNE defects).

G- Fixed cost that the manager must incur if he/she defects. This could include costs of physical capital, etc.

L_i- Licensing or royalty fee charged to the subsidiary in period i (i = 1, 2).

(a) Rents earned by the manager in one product cycle: \( V = (R - L_1) + (R - L_2) \).

\( V/r \)- Present value of rents to the manager of maintaining the relationship.

The manager ("a" for agent) has an "individual rationality" constraint (IR): the manager must earn non-negative rents. The manager also has an incentive-compatibility constraint: the manager must not want to defect in the second period.
Where

\[ V = (R - L_1) + (R - L_2) \]

\( V/r \) is the present value to the manager of the future rents, if there are any. \((R - G)\) is the payoff to unilaterally defecting.

The MNE similarly has an "individual rationality" constraint (IR): the MNE must earn non-negative rents. The MNE also has an "incentive-compatibility" constraint: the MNE must not want to defect (fire the manager) in the second period.

\[ L_1 + L_2 - F \geq 2E \] \hspace{1cm} \text{IR}_m

\[ L_2 \geq R - T \] \hspace{1cm} \text{IC}_m
Combine the IC constraints.

\[(5) \quad R - T \leq L_2 \leq G + V/r\]

Firm's objective is to minimize V subject to this incentive compatibility. Solving this problem yields:

\[(6) \quad 2R - L_1 - L_2 = V = r(R - T - G) > 0 \quad \text{(rent share to the manager)}\]

Result 1:

If \( R \leq G + T \), the MNE captures all rents in a product cycle, henceforth referred to as a rent-capture (RC) contract. This situation occurs when

(1) The market is relatively small.
(2) Defection costs for the MNE (T) are high.
(3) Defection costs for the manager (G) are high.
If $R > T + G$, there is no single-product fee schedule that will not cause one party to defect.

Now consider the case where the manager's IR constraint does not hold; that is, the MNE shares rents with the manager.

**Result 2:**

If $R > G + T$, the MNE can credibly offer a long-term commitment, but must share rents with the subsidiary. This is henceforth referred to as a rent-sharing (RS) contract. The one-period rents earned by the subsidiary are smaller as

1. $r$ is small (future rents are more valuable)
2. $G$ is large (the incentive to defect is smaller)
3. $T$ is larger (the MNEs incentive to defect is smaller).
4. $R$ is larger (the subsidiary's share increase faster than $R$).
Figure 14.1: Values of F and G supporting alternative Modes