Behavioral Approaches to Optimal FDI Incentives

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Countries attempt to attract foreign investors by offering them a set of incentives. The most common types of foreign direct investment incentives are grants and tax relief. Although the amount of the grant is independent of future situations, the value of a tax relief depends on future profits. Our study used the behavioral approach to test experimentally the preferences of managers regarding the desired types of incentives under various conditions. We found, ‘Regret Effect’, ‘Statues Quo Bias’, and ‘Insurance Effect’ in subjects’ decision making. A country can improve the incentives it offers by considering the various behavioral biases of the companies’ managers. Copyright © 2008 John Wiley & Sons, Ltd.

INTRODUCTION

Investment by a multinational corporation (MNC) is accompanied by various substantial benefits for the host country’s economy. Governments that view the MNC as an engine for growth and development, and may offer various incentives in order to attract the investment of MNCs. Our paper focuses on the process of choosing the optimal set of incentives given by the government of the host country. The novelty of this paper is in the inclusion of a behavioral theory and approach, considering the optimal set of foreign direct investment (FDI) incentives. We hypothesized that an MNC is governed by a CEO and other senior officers, and their considerations for choosing the right location for their investment follows the well-known biases of behavioral economics. We argue that understanding the considerations of the MNC officials may improve the government’s choice of an optimal set of incentives.

The globalization processes that have taken place for the past two decades, as well as the development of MNCs, have led to a search for new sites for investment. The process of choosing a site for this purpose may be divided into two stages. In the first stage, the MNC examines various possible sites, focusing on the conditions of the site by considering its economic stability, the availability of professional labor, the political and security situation, the legal system, modern infrastructures, trade agreements and trade treaties, etc. A short list of suitable sites is created.

In the second stage, the MNC looks for the most profitable site for investment by examining the short list of countries. Usually, the MNC negotiates with the appropriate governments looking for the optimum set of incentives. The countries that are in the short list having similar economic characteristics may compete among themselves.
by improving their offer of incentives for winning the foreign investment. A host country that is competing for the foreign investment may offer the foreign company financial incentives in order to raise its attractiveness as the best site for the investment (UNCTAD, 2000). For example, Intel established a factory in Costa Rica by investing 600M USS. This factory employs about 2000 workers. The Costa Rica government gave Intel a grant of 300M USS. Another example is Canon, which sought a place to establish a factory in Asia. The Vietnamese government offered Canon a tax relief for 10 years, which was a major factor in Canon’s decision to establish its factory in Vietnam (Bjorvatn and Eckel, 2006).

The two most common types of incentives are grants and tax relief. The impact of these incentives on the decision of where the company will be located has increased over time (Taylor, 2000) and, as a result, an incentive competition has emerged. This competition may cause a shift from the host country to the foreign company of the major part of the surplus from the activities of the foreign company (Oman, 2000). Blomstrom and Kokko (2003) suggest avoiding this competition by having agreements between the countries regarding the ‘rules of the game’ of FDI incentives, especially between countries in specific regions in which the competition might be fierce.

A number of models have been developed for examining FDI incentives and their efficiencies. Barros and Cabral (2000) examined the influence of the size of a country and its unemployment rate on the incentives given to an MNC. According to their model, subsidy competition may lead to optimal FDI location, whereas a policy of no subsidy may distort it. Two reasons can support this proposition. First, the competition among countries compels them to commit to improving their respective infrastructure and macroeconomic system and, second, that competition can bring an optimal allocation of FDI to those countries which benefit more from FDI incentives (see Bjorvatn and Eckel, 2006).

Kaplan et al. (2003) studied the influence of information on the optimal mix of fixed grant and tax relief to be offered to an MNC. They showed that in equilibrium, the competing countries tend to use grants as the main tool to attract FDI. The participants in this game are countries that have to offer a set of incentives to attract FDI, and an MNC that has to make a decision regarding its investment location. Both the countries and the MNC base their decision on the present value of flows of future revenues and outlays. Future revenues depend on the productivity in the host country and the efficiency of the entering MNC. Information on the level of productivity may be available to either the host country or the MNC. Asymmetric information plays a major role in the process of choosing the optimal set of incentives. When there is complete information on the reliability of the foreign company as well as on the efficiency of the host country, the specific type of incentive (grant or tax relief) is of little importance to either the country or the MNC. However, under incomplete information on productivity, the mix of grant and tax relief is important and has a major impact on the MNC and the country’s decision. In that case, on the one hand, the country fears that the foreign company will exploit a one-time grant, and may within a short time terminate its investment and leave the country. On the other hand, the country may fear that substantial tax relief will lead to exaggerated benefits for the MNC when profits are high. Conversely, the foreign company that invests in the project may worry that the host country will not fulfill future commitments for the tax relief. In this case, the foreign company is already ‘bound’ to the country by the sunk costs, and switching to another site is not relevant. Therefore, under risk aversion and increasing risk, the MNC prefers a one-time grant whereas the countries prefer tax relief.

The literature on individual decision making and choice has long ago acknowledged that human agents violate many of the fundamental assumptions of economic theory (see the survey by Camerer, 1995). Empirical evidence accumulated in classroom experiments and economic laboratories has motivated new generalized theories (e.g. Kahneman and Tversky’s 1979 Prospect Theory) that may be utilized to explain the experimental evidence and gain insight into various aspects of economic reality. Behavioral effects have become a significant part of explanations regarding human decision making under uncertain conditions. Studies in the behavioral economics and finance fields use behavioral effects to explain various contradictions to known theories. Results from economic experiments are used to support behavioral effects.

Kahneman and Tversky (1979) developed an alternative model to the expected utility theory,
the Prospect Theory. They suggest that subjects’ value function $V$ should be treated as a function in two arguments: the asset position that serves as a reference point and the magnitude of the change (positive or negative) from that reference point. Kanheman and Tversky proposed that the value function is (1) defined based on deviations from the reference point, (2) generally concave for gains and commonly convex for losses, and (3) steeper for losses than for gains so that $v(x) < -v(-x)$. They also suggest that people overweigh outcomes that are considered certain, relative to outcomes that are merely probable, and named this effect the ‘Certainty Effect’.

Kachelmeier and Shehata (1992) conducted a series of laboratory experiments in China in order to elicit people’s certainty equivalents for a sequence of lotteries. They found that the average ratios of certainty are equivalent to the expected values for the high-prize trials, and were systematically lower than the ratios for the low-prize trials across win percentages. There was a marked trend from risk-loving or risk-neutral preferences to risk-averse as payoffs increased.

Benartzi and Thaler (2004) investigated the value of freedom of choice. In their study, they presented retirement investors with information about the distribution of outcomes that they could expect to obtain from the portfolios they had selected, and from the median portfolio selected by their peers. A majority of participants actually preferred the median portfolio, and this provided some evidence for the fact that investors do not have well-defined preferences.

The purpose of this study is to test the impact of behavioral biases on the decision process of professional managers and financial experts when they consider their preference for the grant or the tax relief under various risky situations. We examined experimentally the influence of behavioral effects on the investors’ decision making regarding incentives. We used a questionnaire to determine the optimal mix of tax relief and grants while taking into consideration various psychological effects. The questionnaire was distributed to a large number of MBA students with prior managing experience, some of them were accountants. Their responses led us to propose an improved mix of incentives that can reduce the country’s cost of incentives such that the attractiveness of the country is not hurt.

The questionnaire included 20 questions that examined the investors’ preferences between the investment grants and the tax relief as dependency in the risk embodied in the expected cash flow. Furthermore, some of the questions considered the possibility of reducing the grant or the tax relief in exchange for receiving insurance in case of loss.

The rest of the paper is organized as follows: First, in the second section we describe the experimental procedure. Next, in the third section, we present the primary results and provide some possible explanations. Finally, we summarize the conclusions and present some policy implications.

EXPERIMENTAL PROCEDURE

The participants in the experiment were 102 MBA students from Ben-Gurion University and the College of Management. However, we used the results of 86 subjects (55 men and 31 women; average age 33.6 years), because 16 subjects either did not answer all the questions or omitted some data, and their results were out of the range of two standard deviations. The experiment took place during a regular lesson, and lasted approximately half an hour.

We presented the subjects with four different cash flow scenarios with equal means but different risks, and confronted them with two initial states as follows: First we asked them for the minimum grant they were willing to accept in order to concede the tax relief.

Second, a similar question was then asked about the minimum tax relief they were willing to get in order to concede the grant.

The fourth scenario (the insurance case) considered the possibility of losses, and the subjects were asked to state the amount they were willing to pay in order to be insured if losses occur.

**Description of the Scenarios**

Table 1 presents the possible cash flow in each scenario.

In each scenario, subjects were asked to choose between receiving 100 000 NIS grant and having their tax reduced from 35 to 25% (10% tax relief). The subjects were told that in the case of a loss (scenario 4) they would get tax refund.
In scenario D subjects faced the possibility of loss. In this case they were asked for the compensation they are willing to get in the case of a loss in order to reduce the grant or the tax relief. In this case we tested the insurance premium of the subjects.

The questions were presented as follows:

1. The grant of 100 000 NIS is reduced to 50 000 NIS and you are compensated in the case of a loss. What is the minimum compensation required in the case of a loss so that you would accept the reduced grant?

2. The tax relief would be 5% instead of 10% (reduction from 35 to 30% tax rate), and in the case of a loss you can receive compensation. What is the minimum compensation you are willing to receive in case of a loss in order for you to accept the reduced tax relief?

RESULTS

Table 2 presents the following results:

1. The average minimum grant the subjects were willing to accept in order to give up 10% tax relief (expected value is 100 000 NIS for each scenario).

2. The average minimum tax relief the subjects were willing to get in order to give up 100 000 NIS grant.

Table 3 presents the results of a t-test for the comparison between the minimum grant and the tax relief of the different scenarios.

Table 3 shows that increasing the risk of the cash flow raise the minimum grant. According to the expected utility theory, as the risk increases the subjective certainty equivalent of risk-averse subjects decreases, and vice versa for risk seekers. The minimum grant in this case is the subjective certainty equivalent, meaning that the subjects show risk-seeking behavior.

Although scenario D is riskier than scenario C, we found that the minimum grant for scenario D is lower. In scenario D the tax relief also has a negative effect, as in the case of a loss (−100 000 NIS) tax relief reduces the taxation refund. Although the expected value of the tax relief is the same as in the other scenarios, the possibility of a loss has higher effect as losses have higher effect than profits (loss aversion) (Kahneman and Tversky, 1979). Table 2 also shows that the required minimum tax relief increases as the risk of the cash flow is increased (but the difference between scenarios B and C was not found to be significant).

The certain alternative, the grant, is the same in all the scenarios. An increase in the required minimum tax relief between scenarios A and B is typical to risk-averse subjects. The same tax relief in scenarios B and C is typical to risk-neutral subjects. These results are inconsistent with the risk attitude that was found when the question focused on the required minimum grant. The increase in the tax relief between scenarios C and D is consistent with the decrease in the grant between these two scenarios caused by the loss aversion.

It seems that the subjects’ preferences changed when we switched from a grant to tax relief. When
subjects face an initial state in which they have tax relief with an expected value of 100,000 NIS they ask for a grant above 100,000 NIS \((T\text{-test significance }<0.01\) for the hypothesis that the average grant is lower than 100,000 NIS in all scenarios), as we expected from risk-seeking subjects. However, when they faced a state in which they can get a sure grant of 100,000 NIS they asked for tax relief above 10% \((T\text{-test significance }<0.01\) for the hypothesis that the average tax relief is lower than 10% NIS in all scenarios). A tax relief above 10% gives the subjects an expected discount above 100,000 NIS as expected from risk-averse subjects.

A possible explanation for the inconsistent results is that subjects pay more attention to the tax relief if he/she deems the project as having high cash value. In this case the increase in the high-valued cash flow (which is also an increase in the cash flow’s risk) increases the minimum grant. The behavioral bias, which explains this behavior, is the ‘Regret Effect’ (Loomes & Sugden, 1987; Loomes, 1988). According to this effect subjects are motivated by the possible regret that they will experience if they give up the tax relief and the cash flow will be in its higher value.

Next we analyze the insurance case in which subjects can insure their losses (the fourth scenario). In the first case of the insurance, the grant of 100,000 NIS was reduced to 50,000 NIS and in the case of a loss the subjects get a refund. The average refund the subjects were willing to accept in the case of a loss in order to accept the grant reduction was 69,468 NIS. A refund of 69,468 NIS gives the subjects an expected value of 34,734 NIS \((69,468/0.5)\), because the refund is given only in the case of a loss. The expected value of 34,734 NIS is lower than the grant reduction by 50,000 NIS \((T\text{-test significance }<0.01\).

In the second case of insurance, the tax relief of 10% was reduced to 5% and in the case of a loss the subjects get a refund. The average refund the subjects were willing to accept in the case of a loss in order to reduce the tax relief was 68,829 NIS. A refund of 68,829 NIS gives the subjects an expected value of 34,415 NIS \((68,829/0.5)\), because the refund is given only in the case of loss. The expected value of 34,415 NIS is lower than the expected value of the tax relief reduction by 50,000 NIS \((T\text{-test significance }<0.01\). It turns out that the difference in the average expected value of these two cases is not significant \((T\text{-statistics is }0.042\text{ and significance is }0.967)\).

The effect of the insurance on the expected value of the project is significant, and subjects were willing to reduce their expected value in order to avoid the possibility of loss. This behavior is consistent with the loss-aversion behavior we saw in scenario D.

As mentioned earlier, some of the subjects were accountants who were studying for their MBA, and their decisions were not the result of misunderstanding the meaning of tax relief. Table 4 presents a comparison between accountants and non-accountants.

<table>
<thead>
<tr>
<th>Table 4. Minimum Grant and Minimum Tax Relief</th>
<th>Minimum grant</th>
<th>Minimum tax relief (%)</th>
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<tbody>
<tr>
<td>Scenario Accountants Others Accountants Others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 109 118</td>
<td>11.57 11.86</td>
<td></td>
</tr>
<tr>
<td>B 116 130</td>
<td>11.91 13.73</td>
<td></td>
</tr>
<tr>
<td>C 125* 176</td>
<td>13.12 12.87</td>
<td></td>
</tr>
<tr>
<td>D 129* 151</td>
<td>13.55 14.44</td>
<td></td>
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\*\(T\text{-test significant }<0.05\) for the hypothesis that the average minimum grant (or minimum tax relief) for accountants is not different than that of others.

Although accountants are more experienced in tax calculations and decision making concerning incentives, overall we did not find significant differences between them and the other subjects (except for grant in scenarios C and D). This result is consistent with the evidence that people with experience or expertise are not immune to framing effects (e.g. Roszkowski & Snelbecker, 1990; Loke & Tan, 1992).

**DISCUSSION AND CONCLUSIONS**

Our results show that investors tend to make decisions in a way that sometimes contradicts the expected utility theory. First, it was found that an increase in the risk of the expected cash flow enlarges the minimal grant required by investors in order to waive tax relief, a finding that contradicts the expected utility theory. This result can be explained by the ‘Regret Effect’ (Loomes & Sugden, 1987; Loomes, 1988), which states that an individual tends to over value tax relief when...
the cash flow is uncertain, as there is fear of regretting the possibility of lower tax relief in case the investment brings in a high cash flow.

Second, it was found that investors demand compensation for changing tax relief into a grant. This result also contradicts the expected utility theory, because the grant is certain and is supposed to improve the investors’ utility when a tax benefit is replaced by a grant. This result can be explained by the ‘Status Quo Bias’ (Kahneman et al., 1991), which claims that individuals tend to remain in existing situations to postpone better alternatives.

Third, it was found that decision makers in firms are influenced by the way the incentives are presented. Sometimes similar incentive baskets are presented in a different manner, and this might lead to different decisions. Hence, countries that compete for the arrival of foreign investors and offer sets of incentives in order to draw in the investors must take into consideration the ways in which possible incentive baskets are presented. A country can raise its level of attractiveness for foreign investment by changing the structure of the incentives basket, without changing the basket’s cost. This behavior can be found with ordinary subjects as well as with experienced subjects (such as accountants).

We also considered the possibility that a specific incentive will be activated only in specific cases. For example, an investor receives a grant only if he/she suffers losses. We examined what is the required amount of compensation to be deducted from the grant and be received only in the case of loss. This incentive method serves as a kind of an ‘abandon option’ for the investor, in case the investment does not live up to its expectations (insurance of losses). We found that the expected amount of insurance required by investors is lower than the value of the offered incentive. These results are explained by the ‘Insurance Effect’ (Slovic et al., 1982), which states that as losses are more intimidating than costs, the individuals are willing to pay a higher premium than the expected damage in order to avoid the possibility of loss. A government that wishes to reduce the cost of incentives can achieve this by offering an incentive with insurance characteristics. However, we must caution that this type of incentive may raise the chances of moral hazards and adverse selection. Our results can be used to improve the utilization of government budgets by helping to plan a set of incentives that raise the attractiveness of a country to foreign investors. We suggest that by considering behavioral biases of decision makers, a government can save costs and raise its attractiveness.

REFERENCES


