OWNERSHIP STRUCTURE, AGENCY COSTS, AND DISCOUNT RATES

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Abstract

In this paper, we explore the effects of agency costs on discount rates for public sector enterprises as well as private sector enterprises. Ownership structure has a direct impact on agency costs, and discount rates. We show this through an application of the Capital Asset Pricing Model (CAPM) framework. With the addition of agency costs, the discount rate, under uncertainty, for public sector enterprises (PSEs) as well as private sector enterprises (PVTSEs) becomes a variation of the CAPM risk adjusted discount rate plus a premium for agency costs. In some circumstances the impact of agency costs "cancels out," otherwise it remains a relevant input to the calculation of required rates of return. For PSEs, under risk neutrality, the discount rate is the risk-free rate plus a premium for agency costs.

Keywords: ownership structure, agency costs

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Introduction

In capital budgeting project decisions, using the appropriate discount rate to estimate the present value of cash flows is very critical. There has been considerable debate in the finance literature about the appropriate discount rate for public sector projects. According to Lintner(1980), cash flows of public sector enterprises should be discounted at the risk-free rate in the absence of uncertainty(under risk-neutrality). On the other hand, the Capital Asset Pricing Model developed by Sharpe has been used extensively to estimate discount rates for private sector enterprises. In the CAPM framework, the discount rate depends on the risk-free rate plus a risk premium that is consistent with the systematic risk of the cash flows attributable to the project. Lintner(1980), Hirshleifer (1966), and Baumol(1968) argue that regardless of public or private ownership, risks involved in any particular project's cash flows should be viewed the same way and, therefore, one should use the CAPM framework to estimate the discount rates in both cases. Arrow and Lind(1970), Bailey and Jensen(1972), and Rubinstein1973) all argue that since the risks of the public sector enterprises are ultimately borne by private individuals rather than the government per se, public sector investments should require the same rate as private sector enterprises. In this paper, we consider only these two types of ownership structures: Private sector enterprises and public sector enterprises.

Observations made by Ayub and Hegstadt (1986), Boardman and Vining (1989), Ezekeil (1984), Ramanadham (1984), Rudolph and Rudolph(1987), and Shleifer(1998), among others, indicate that the performance of public sector enterprises around the world is far inferior to that of private sector enterprises. The reasons for this inferior performance can be attributed to higher agency costs associated with public sector enterprises as explained later in this paper. Failure to include the impact of agency costs in PSE discount rates can lead to the use of inappropriate discount rates to evaluate projects. This, in turn, would lead to the possibly frequent rejection of projects whose true NPVs are positive, and/or the acceptance of projects whose true NPVs are negative. This unfortunate process could be an important reason for such observed poor performance by the PSEs.

Separation of ownership and control in any business organization creates an agency problem. While agency problems exist in PVTSEs, PSEs are an

extreme example of separation of ownership and control (Zeckhauser and Horn, 1989), hence would have even greater agency problems. In PVTSEs, the ability of the shareholders to sell the stock in secondary financial markets or vote out management can force the managers to act in the interests of the shareholders.

On the other hand, the non-transferability of and the diffused and indirect nature of ownership of PSEs, and the absence of a market structure in which the "shares" of such an enterprise are regularly priced severely weaken the mechanisms that help align the actions of management with the interests of the 'tax payer-shareholder' constituents. Fama (1980), Gupta (2005), Laffont and Martimort(2002), Megginson 2005), Shleifer and Vishney(1997), and others have indicated that politicians, consumers, suppliers, labor, and management can impose a claim on the functioning of the enterprise through rent-seeking behavior. Each obtains a "piece of the pie," and thus, the position of the ultimate owners, the tax payer-shareholders, is diluted considerably. PSEs are also hindered by their inability to link management compensation to the enterprise's financial performance. Since the shares of PSEs are nebulously defined and non-transferable, the potential for takeovers is non-existent. Additionally, in the absence of market-based share prices, it is very difficult to find a measure that provides a basis for structuring managerial incentives such that they are tied to managerial performance. As a consequence of these factors, the agency costs in PSEs are likely to be higher. These costs should be taken into account in the discount rates for PSEs. Not doing so would result in accepting projects that do not meet the correct hurdle rate, which diminishes the value and performance of the enterprise.

Recent advances in agency cost theory, as first expounded by Jensen and Meckling(1976), and subsequently developed by authors including Barnea, Haugen and Senbet(1985), Copeland, Weston and Shastri(2005), Cornell and Shapiro(1987), Fama (1980), Fama and Jensen(1983),Gupta (2005), Shleifer (1998), and Shleifer and Vishney(1997), provide an excellent framework for the analysis of the poor performance of PSEs. Previous studies by Aharoni (1986), Boardman and Vining (1989), Jones(1982), Vernon and Aharoni(1980), using the agency cost theory framework, show that the main reason for the inferior performance of public sector enterprises can be attributed to higher agency costs associated with PSEs. But they do not provide any specific mathematical model to incorporate those agency costs into decision-making processes. In this paper, we examine the implications of ownership structure and agency costs on discount rates and offer a way to functionally incorporate agency costs into the Capital Asset Pricing Model.

Agency cost theory

Agency costs arise from the conflicting interest among parties to a corporate or other enterprise, such as management, suppliers of capital, employees, customers, and various levels of government, including officials and staff persons. The term "agency" derives from the fact that decision making powers are delegated to agents who perform on behalf of other parties usually referred to as principals. For example, shareholders delegate the day-to-day decision-making function in a corporation to managers. In this situation, shareholders are the principals and corporate managers are the agents. The managers are expected to act in the interest of the shareholders while making decisions on a continuous basis. There is no reason to believe that the managers always act in the best interests of the shareholders.

In the principal-agent relationship, the agent may not always act in the best interest of the principal because of the nature of the contract arrangement. Essentially, these are incompletely specified contracts, as the actions to be performed by the managers cannot be fully enumerated and described in a contract. Hence, the problem of agency costs arises and manifests in many ways. These ways include:(a) Excessive perquisite consumption; (b) Informational asymmetry; (c) The time horizon problem; (d) The risk aversion problem; and (e) The wealth transfer problem. These can be, to some extent, limited by incentive structures and contracts, implicit or explicit (but incomplete), designed to induce the managers (agents) to act in the best interests of the shareholders (principals). The divergence of interests of the agents and the principal result in costs and hence the name agency costs. These costs are borne by the shareholders (principals) in the form of reduced value of the firm.

The shareholders have to provide incentives or put constraints on the managers and monitor their performance, to ensure that they act in the shareholders' best interest. These actions have costs associated with them. An alternative to these monitoring costs is the use of managerial compensation as a control tool, including incentives that will induce the managers to act in the best interests of the shareholders.

In most principal - agent relationships, the principal will incur monitoring costs directly or indirectly as a part of an agent's compensation package in order to ensure that the agent will act in the best interest of the principal. These costs can also

be thought of as the costs involved in resolving the conflicting claims on the enterprise coming from the shareholders and the managers. Similarly, there would be costs involved in resolving the conflicting claims of other groups affected by the firm, called stakeholders, like bondholders, employees, customers, suppliers, and the government. All these costs are incurred as part of the total agency costs. Cornell and Shapiro(1987) have examined the issue of agency costs incurred by private sector enterprises in the resolution of conflicting claims on the firm by various stakeholders and conclude that these costs are substantial and do affect the performance, hence the value, of a firm.

Typical agency problems

Consideration of the nature of the agency problems usually encountered in organizations can shed some light on the mechanisms at play and how they influence total agency costs.

Excessive Perquisite Consumption Problem: Managers do not work in the shareholders' interest out of pure altruism. They expect to be compensated for their effort. Although the pecuniary benefits like salary, bonuses, etc., that the managers receive are stipulated in their employment contracts, there are many non-pecuniary benefits that the managers can give themselves because of the discretionary power vested in them. As agents of the shareholders, who make the day-to-day decisions of the firm, managers can also give themselves extra perquisites (perks) that are not stipulated in their employment contracts. As a result of such activities, there is a transfer of wealth from the firm to the managers. When the manager is only a partial owner or an employee of the firm, the agency costs arising out of the "excessive perquisite consumption problem" can be substantial.

Informational Asymmetry: Managers make day-to-day decisions that may not be in the best interest of the principals, so the principals must carefully monitor the managers' activities. This may be easier said than done. It is difficult for the principal to monitor the agent because in most cases the agent, that is the manager, as an insider to the firm has more information on a day-to-day basis about the details of the firm's operations and future plans than do the principals(shareholders). This "divergence" between the agent and the principal, in the quantity and quality of information available to each, is called "informational asymmetry." It gives the managers a certain degree of protection, veils or obscures their actions, when they make day-to-day decisions which may not be in the best interests of the shareholders.

Time Horizon Problem. Although firms may have indefinite lives, the managers' tenure with a firm is limited to a relatively short time period. Managers prefer investing in projects that tend to have near-term profit, even though they may not be as good for the firm as other projects would be with more distant pay off on which they would have no claims. The problem becomes even more significant when the firm offers managers incentives to increase short term profits, which could lower the value of the firm in the long run.

Risk Aversion Problem. Managers with a fixed salary or a fixed benefits package are hesitant to undertake profitable but risky projects. That is, if the project is unsuccessful the managers may lose their jobs, but if the project succeeds, the managers' fixed salary will not allow them to participate in the profits generated by the successful project. Risk averse managers do not have incentives to increase the value of the firm for the shareholders by investing in risky projects. This lowers the firm's value.

Agency costs of public sector firms

The agency costs of public sector firms are generally very high as the relationship between principal and agents are, to a certain extent, abstract in nature. Also, public sector firms have multiple goals and social responsibilities with which the private sector firms are not burdened. The relationship between the managers and the owners of the enterprise, which in the case of PSEs would be the general, tax-paying public, is convoluted, hence managers cannot be held easily accountable for their activities. The stakeholders of a public sector firm have conflicting claims on the firm which cannot be easily resolved through explicit or implicit contracts. Consequently, public sector firms would encounter a severe "excessive perquisite consumption problem." Similarly, the problem of "informational asymmetry" would lead to rent-seeking behaviors by the agents of the public sector firms and thus exacerbate the problem. Generally, public sector firms have much higher agency costs than private sector firms.

Most public sector enterprises are "owned" directly or indirectly by the government with the ownership funds coming from "taxpayer-shareholders," so those persons are viewed as the true owners. The goals of these firms are often difficult to identify precisely. They usually have several goals, often of similar priority, which range from providing employment to promoting rapid industrialization, providing a product or service to the public, or improving infrastructure. The government that controls these firms will almost certainly be under pressure to satisfy many constituencies. The PSEs are managed by a team of professionals whose interests

may be distinctly separate from those of the government that funds them and different yet again from the interests of the "tax-payer" shareholders. Compares to a PVTSE, which would typically have one main level of separation between ownership and control (principals--stockholders, agents--managers), a PSE would typically have two main levels of separation (principals—tax-payers, agents—government executive and legislative branch officials, then principals—government executive and legislative branch officials, agents—bureaucrats and managers). Thus the PSEs would incur more agency costs for this reason.

The PSEs are controlled through a variety of agents like ministers, legislators, commissioners, agency directors, and other bureaucrats, who can be thought of as agents of the general public. The governance of PSEs generally takes the form of a corporate board or a department or agency of the government with varying degrees of autonomy, but still controlled by the government. Various examples from the United States come to mind, such as the Tennessee Valley Authority (TVA), Ginnie Mae (Government National Mortgage Association), Sallie Mae (Student Loan Marketing Association), the Department of Defense, and the Social Security Administration. Since the management and ownership of the PSE is much more complicated than for a private sector enterprise, substantially higher agency costs will result for a public sector enterprise. As an example of the conflicts that are likely to arise consider the possibility that, while making policy decisions for a particular PSE, the minister of labor might be interested in providing more employment opportunities through the use of labor-intensive processes rather than more capital-intensive ones. The minister of finance might want the public sector firm to generate more income and maximize the spread between revenue and cost so that he can raise tax rates less, whether or not this results in the use of a more labor-intensive process. Similar conflicting claims may be made by employees, managers, consumers, and other kinds of agents or constituents. These inherently conflicting claims on public sector enterprises have to be resolved, which results in higher cost to the firm as each stakeholder gets a "piece of the pie." Also, the conflicting claims are ongoing phenomena which must be resolved continuously. This increases the agency costs of a public sector enterprise even more.

Another facet of the agency costs arises out of the risk-shifting behavior of the managers of public sector enterprises. Private sector firms are believed to demonstrate risk averse behavior. That is, private sector firms invest in high risk projects only if they have higher expected rates of return as required by the Capital Asset Pricing Model. However, a public sector enterprise is relatively risk neutral in that public sector enterprises do not generally require higher rates of return to accept high risk projects. In the simple case f pure risk neutrality, higher returns are preferred to lower returns but the risk level associated with return is irrelevant. Thus the presumption is that agents who are making decisions in public sector enterprises will act in a risk neutral fashion. However, the agents who are running the public sector enterprises might not be risk neutral when making decisions, instead might be biased towards risk aversion and choosing less risky projects. For example, the careers of high level and middle level managers and decision makers in public sector enterprises are related to the successful performance of the projects they undertake, so they would like to choose less risky projects over more risky projects, thus would exhibit more of a "satisficing" approach. Similarly, in day-to-day decision-making they would like to make less risky decisions or defer decisions which involve more risks. Over time, public sector enterprises would be saddled with more and lower risk projects which inherently have low returns. Thus the performance of these enterprises would be reduced to a great extent because of such distortions in the decision-making process. Therefore, the presence of agency costs would be an important factor in the explanation of the poor performance of the public sector enterprises.

Agency costs of private sector firms

The goal of a private sector firm is to maximize the wealth of the shareholders, i.e., the owners of the firm. In this context agency costs are ultimately borne by the shareholders and may constitute a significant cost in many situations, as noted by Albuquerque and Wang (2004). Thus, it is in the interest of the shareholders to minimize those agency costs. Large private corporations are owned by individuals who can buy or sell shares of the firm. The price of those shares ownership claims in the financial markets provides a direct signal to the owners about the performance of the firm.

In this context the Capital Asset Pricing Model provides a norm for the required rate of return on any firm.

$$E(K_i) = K_{RF} + b_i[E(K_M) - K_{RF})] \quad \text{-----(1)}$$

Where,

$E(K_i)$ = Expected rate of return for firm I,

$E(K_M)$ = Expected rate of return on the market portfolio,

K_{RF} = Risk-free rate, and

b_i = Beta of firm i.

Albuquerque and Wang (2004), have incorporated agency costs into asset pricing using a continuous time framework. Krishnaswamy, Rathinasamy, Mantripragada, and Mangla(1994) have shown, using the one period CAPM and a Lagrangian function, that the Capital Asset Pricing Model is modified as shown below when agency costs are incorporated.

$$E(K_i)_c = [K_{RF} + C_i] + b_i[E(K_M) - (K_{RF} + C_M)] \text{ -----(2)}$$

Where,

$E(K_i)_c$= Expected rate of return for firm i adjusted for agency costs,

C_i = agency costs incurred by the firm expressed as a percent of the market value of firm i, and

C_M = agency costs incurred, on average, by all firms expressed as a percent of the value of the market portfolio. $C_M = \Sigma\ w_i C_i$, where w_i is the proportion of the market portfolio value made up by firm i.

The Security Market Line(SML) from the Capital Asset Pricing Model is thus modified in two ways. First, the agency cost premium is added to the risk-free rate. Second, the risk-premium is reduced by an amount which is the average of the agency costs for all firms scaled by beta. In other words, the intercept is increased and the slope is reduced. This may be an important extension which should help explain the poor performance of public sector enterprises.

Managers of private sector enterprises are most likely to use the Capital Asset Pricing Model to make project selection decisions based on NPV or other criteria. Assuming the simple 100% equity firm case, the discount rate used to calculate the NPV would equal the equity required rate of return as determined by Equation (2) above. The difference between the usual $E(K_i)$ determined via the SML and $E(K_i)_c$ from the adjusted SML is:

$$E(K_i) - E(K_i)_c = C_i - b_i C_M \text{ ----------(3)}$$

As has been previously noted, more agency costs result in riskier organization since managers operate out of their personal risk aversion and avoid riskier projects that could increase the value of the firm, so C_i should be directly related to b_i due to this risk averse behavior of managers. If C_i is a linear of function of b_i of the form:

$$C_i = b_i C_M \text{ ---------- (4)}$$

Then

$$E(K_i) - E(K_i)_c = C_i - b_i C_M = 0 \text{ --------(5)}$$

And the impact of the agency costs on the firm's required return on equity cancels out. In this case, use of the SML in its regular form to determine the discount rate is completely appropriate. It must be noted that if that inequality does not hold, then using the unadjusted SML to determine required rates of return for PVTSEs would result in error in the estimate. One of the following two cases could occur:

$$C_i > b_i C_M \text{ ----------(6a)}$$

Or

$$C_i < b_i C_M \text{ ----------(6b)}$$

If (6a) holds, using the regular SML instead of the adjusted SML would underestimate the discount rate, while it would result in the overestimation of the discount rate if (6b) holds.

Performance of public sector enterprises

In case of public sector enterprises, common practice is to assume that decisions should be made under the condition of risk neutrality. This is usually justified by the fact that many public projects have costs and benefits that are very widely spread. This results in a "risk pooling" effect, and each individual "taxpayer-shareholder" bears such a small risk as to be considered insignificant. In this case, the required return before considering agency costs would just be the risk-free rate for all projects and specific project risk would be ignored. Then, the required rate of return becomes:

$$E(K_i) = [K_{RF} + C_i] \text{ -----(7)}$$

Here, ignoring agency costs would have serious consequences on the performance of public sector enterprises. The risk-free rate would be used as the discount rate for project selection which would result in an underestimation of the required return in every instance. Since public sector agency costs are likely to be substantially higher than those in the private sector, this error may be very significant. Public sector enterprises would frequently choose projects which have negative net present values, and, over time, this would lead to overall poor performance of these enterprises.

Even though risk neutrality has been the traditional assumption, there may be situations where it should not be made, and a risk premium should be included in the discount rate. If an investment project

is so large that the risk borne by any individual would still be large or is somehow targeted such that some subset of the total constituency would bear sizable costs and risk while others may be almost exempt whether or not increased benefit would be enjoyed, the situation reverts to the PVTSE case where both agency cost and risk premia are appropriate to consider.

Summary and conclusions

Our exploration allows us to make the following interesting observations. Firstly, it is desirable for PSEs(under the condition of risk neutrality) to use a higher discount rate adjusted for agency costs. This equals the risk-free rate plus an agency cost premium which could be empirically estimated, for evaluating projects. This is in contrast to some earlier studies and the conventional wisdom where it has been concluded that public sector projects should use only the risk-free rate to discount future cash flow streams due to the risk neutrality assumption. Secondly, an alternative approach can be suggested to attempt to better control agency costs by providing incentives to reduce conflicting claims on the public sector enterprise. This can partly be achieved by setting clearer goals for these enterprises to reduce internal conflicts. Privatization of public sector enterprises is another route taken by governments around the world to reduce or minimize agency costs. The claims of shareholders are clarified and one major "layer" o principal-agent dynamic is removed.

Encouraging managers to make decisions on a risk-neutral basis including the adjustment for agency costs should lead to a better performance by public sector enterprises than what is the case now. This "agency cost" approach has the potential to yield better management of public sector enterprises.

It has also been noted that most public sector enterprises have some incentive schemes in place (Aharoni, 1986). These incentives should be reviewed in light of our conclusions and geared towards reducing agency costs due to exogenous factors and discouraging overly risk-averse behavior on the part of PSE managers. The subsequent reduction in agency costs could substantially boost PSE performance and benefit all. Obviously more study in this direction is warranted.

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