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'De Facto' Residual Claimants and Nonprofit Governance:

Who Benefits When Nonprofits Profit?

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-ABSTRACT-

Modeling nonprofit governance and conduct is complicated by the absence of a formal residual claimant. Fama and Jensen (1983b) argue that insiders should be denied governance authority in nonprofit organizations (NPOs) to guard against expropriation of donations. Empirically, however, the opposite is frequently found, with insiders enjoying significant decision rights over organizational policies. In this paper, I propose that residual claimancy in commercial NPOs is divided between donors and insiders in a 'de facto' sense. Because donations flow in one direction, donors assume a greater share of residual claims when their donations are needed (i.e., in "down" economic periods) while insiders enjoy private benefits when the organization earns high levels of economic surplus. I develop a model based on this assumption and explore the relative efficiency of insider versus donor governance for financial decisions such as capital acquisition and insider compensation. I find that donor governance is efficient in the special case where the nondistribution constraint does not constrain distribution of the financial residual. In all other cases, donors under-invest in risky capital assets ("capacity"). Conversely, insider boards set compensation inefficiently, failing to tie wages to the level of the financial residual. Insiders may also over-invest in risky assets, but are disciplined by bond markets and donors' willingness to support the organization in times of financial need. The model yields clear empirical predictions about the consequences of insider versus donor governance on investment and compensation policy. Inefficiencies in both donor and insider-dominated governance are consistent with the empirical observation that decision rights are typically divided between donors and insiders.

1. Introduction

The assignment of residual claims is a defining feature of organizational forms. Fama and Jensen demonstrate that allocations of decision rights can be used to minimize agency costs (Fama and Jensen, 1983b). Governance authority and other formal decision rights are commonly granted to the residual claimant, which helps to minimize incentive conflicts and control agency costs (Hansmann, 1996). Residual claims, therefore, help to both define organizational forms and explain central features of their operation.

Nonprofit organizations (NPOs) and their conduct are only partially explained within this framework. Most notably, the *absence* of a residual claimant is the defining characteristic of nonprofits[1]. This feature helps to explain their existence (Easley and O'Hara (1983), Glaeser and Shleifer, (2001))[2]. However, the lack of a formal residual claimant begs the questions of how governance authority and other decision rights are assigned in nonprofits. Fama and Jensen note only that, in the absence of takeover threats or discipline from outside residual claimants, nonprofit boards [should] include few if any inside agents (e.g., the CE0) in order minimize "collusion and expropriation of donations" (Fama and Jensen, (1983a)).

A financial residual should, arguably, be incorporated into a more complete theory of nonprofit governance. Commercial nonprofit organizations (e.g., hospitals and universities) generate significant financial residuals, on an annual basis[3]. While no private party has a formal claim to the residual, multiple parties benefit from the residual. Donors (and society) may benefit from cross subsidies made to socially valuable activities. Donors may also benefit

[1] In a formal sense, the absence of a residual claimant simply means that no private party has a legal claim to the organization's financial residual.
[2] Because no private party can extract the economic surplus gained from expropriating consumers or donors, there is less incentive to do so. This confers an economic advantage to the NP form in certain environments.
[3] The measurement and definition of a financial residual in NPs is complicated by the fact that the residual must eventually be "spent back" inside the organization. I define the financial residual within a NP as funds available for expenditures within the organization after payment of business expenses required to earn profits.

financially if a successful commercial endeavor reduces the need for donations. Crucially, insiders also benefit. For example, a university's residual may be used to fund salary increases, research facilities or other amenities that faculty value. Likewise, a hospital's residual may be used to acquire the latest medical equipment, which makes physicians more productive and also enhances their reputation.

In this paper, I formulate a theory of governance and conduct in commercial nonprofits by introducing the concept of a *de facto residual claimant (DFRC)*. A "de facto residual claimant" gains marginal private benefits from increases in the organization's financial residual, even where they do not have formal claim to the residual. My central premises (motivated below), are: 1) that DF residual claimancy is shared between insiders and donors in NPOs; and 2) that the share of the DF residual enjoyed by each party is state- dependent, varying with the level of the economic residual. Most notably, because donations flow in only one direction (into the organization), donors are likely to assume a greater share of `DF residual claimancy in "down" periods when their donations are needed, while failing to enjoy commensurate positive returns when there is economic surplus (which is "trapped" due to the nondistribution constraint). The opposite holds for insiders who may benefit disproportionately in favorable financial states.

I use the notion of divided (by states) residual claims to consider several key questions of governance and commercial activity. Given the competing interests of insiders and donors, what characterizes "first best" policies over investment and insider compensation? Will either donor or insider-dominated boards pursue efficient investment and compensation policies? How do labor markets and debt markets discipline the conduct of nonprofit boards? What are the predictable differences in the conduct of insider and donor boards?

One consequence of divided residual claims is that the governing entity may impose agency costs on the party not in power. For example, to the extent that donors are residual claimants when commercial asset returns are relatively low and insiders are residual claimants when returns are high, the parties naturally differ over the ideal scope and riskiness of assets. Donors may wish to contain risk and reduce the scope of commercial operations, reasoning that they do gain the full benefit of “upside” returns, while insiders will have the opposite opinion. Neither party is fully motivated to undertake costly efforts to increase organizational efficiency, to the extent that there are some states in which they do not benefit from such actions. Either party, if given the opportunity, may direct the organization’s mission towards their own preferences.

However, opportunistic conduct on the part of either party may be disciplined by the various markets in which nonprofits operate. Donors must meet a labor market constraint on compensation to insiders. This may lead donors to internalize, in part, the private benefits that insiders receive from any economic surplus created. Conversely, insiders must obtain funds from capital markets (most notably, the debt markets). This may lead them to internalize (consider) donors’ willingness to support operations where commercial returns are low.

I introduce a basic model and consider the welfare properties of either donor or insider control. In my model, donors enjoy indirect (psychic) utility from the activities of the nonprofit, while insiders enjoy private benefits from the expenditure of the residual, internally. Commercial activities (e.g., hospital operations, university enrollments or new educational programs) may have either of two state-contingent payoffs (“high” or “low”). Donors make donations only at the end of the period and only in cases where there is an established “need.” A joint welfare maximizing solution is derived to serve as a benchmark for optimal investment and compensation policies. The joint maximizing solution has two essential properties: i) compensation to insiders is set so that more cash compensation is paid out in the high state, where the marginal utility of retained surplus is lower; and ii) capital assets are acquired up to the point where the combined marginal financial and social return is balanced by the marginal cost of capital. In cases where insider compensation cannot be extracted to the desired level (due to a binding "non-distribution constraint"), a second best solution is presented, in which capital accumulation is constrained to some degree.

Next, I take up the question of whether donor or insider governance can achieve the first best solution. I show that, in some restrictive cases, donor governance can achieve the first best level of capital assets ("capacity"). Donors benefit by paying higher cash compensation in the high state, in a manner consistent with the first best solution. This enables them to meet the compensation constraint most efficiently. More generally, however, donor boards will under-invest in capital assets whenever the non-distribution constraint binds because they do not internalize the full benefit of increasing the residual. Conversely, insider governance is generally characterized by inefficient compensation policy, in the sense that insiders prefer to equalize compensation in all states of nature instead of concentrating cash compensation in high periods. This is strategy for forcing an increase in donations. Likewise, insiders do not choose capital assets on the basis of their marginal returns and will overinvest in commercial assets if unrestrained by capital markets. However, in order to borrow on favorable terms, insider boards must consider the willingness of donors to support the costs of such investments in the low state. As a result, properties of the donor utility function determine the level (and efficiency) of investment outlays under insider governance.

My model makes two contributions to the general theory of nonprofit governance and conduct. First, my model offers a theoretical counterpoint to the Fama and Jensen position that insiders ought to be excluded from nonprofit boards. In reality, insiders often play a key role in nonprofit governance (Brickley, Van Horn and Wedig, (2009))[4]. My model explains this

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[4] For example, physicians are regularly included on hospital boards. In addition, one survey found that hospitals CEOs are included as voting members of their boards in about 50% of all hospitals.

empirical fact by showing how donor governance may be inefficient and, conversely, how debt markets may constrain the conduct of insider boards. Second my model makes several empirical predictions about the consequences of insider versus donor governance. Many of these predictions accord with prior intuition. For example, the model predicts that insider boards structure compensation so that significant cash payouts occur even in down periods. It also predicts that donor boards focus on financial drivers such as risk and rate of return when determining capital investment decisions while insider boards do not. Finally, my model predicts that donor governance causes welfare losses where the economic surplus is trapped in the organization and insiders derive the majority of the benefit from this surplus. This result may form the basis of a theory of control of nonprofit boards.

The paper is organized as follows. Section 2 provides motivation for the key assumptions of the model. Here, I describe the institutional context of commercial nonprofits and describe some of the model elements that I use to capture these institutions. The basic model and efficiency results follow in Section 3. Model extensions are described in Section 4. Section 5 describes empirical predictions of the model, focusing on differences in the conduct of insider versus donor boards. The paper concludes in section 6 with a brief discussion of further applications of the model to understand the control of NP boards.

2. Modeling Commercial Nonprofits – Key Institutions

2.1 Overview – The Institutional Setting

The focus of my model is commercial NP organizations, defined as NP organizations that derive a significant percentage of their revenues from the sale of a commercial product or service. The most prominent examples are hospitals and universities. Collectively, hospitals and higher education account for $568BB in revenue annually or about 5% of U.S. GDP. Other examples of commercial nonprofits include arts and cultural organizations as well as other educational institutions (Nonprofit Almanac, 2007). Several institutional features of commercial nonprofits form the basis of the model that follows. In this section, I discuss an important subset of these institutions in order to motivate the model assumptions that follow in Section 3.

2.2 Multiple Revenue Sources and Residual Claimancy

Commercial nonprofit organizations rely upon a combination of both donations and commercial revenues to support their activities (Segal and Weisbrod, (1998)). In the simple model that follows I allow the profitability of commercial operations to vary across two states of nature. In the more profitable state, I assume that changes in the residual affect the level of internal expenditures on the NPO's characteristic activities, also known as "mission." Because both donors and insiders may benefit from such expenditures, they serve as joint residual claimants in this state. In a second state of nature, (i.e., "near bankruptcy") it may be impossible to absorb fluctuations in profits solely by reducing internal outlays. This may be true for several reasons. First, if revenues are sufficiently low, the essential mission of the organization may be compromised by further reductions. Donors may be unwilling to see this occur. Furthermore, it may not be possible to reduce salaries and other amenities below a certain level without risking loss of key personnel (e.g., "talented" insiders). Thus, in a second qualitative state of nature, marginal losses and gain are reflected primarily in variations in needed donations instead of in variations in internal expenditures. In this case, donors serve as primary residual claimants[5].

There is empirical evidence to support these positions. In the case of donors, there is evidence that donations rise to meet organizational need in cases where the organization is in financial need. Conversely, there is evidence that insiders benefit disproportionately from

[5] Of course, a more general model would allow for a continuous range of states of nature in which the success of commercial ventures varies continuously. This does not affect the results that follow. Even with continuous states of nature, a donor with a strong commitment to given level of surplus in the organization will find that they are residual claimants in a well defined subset of these states of nature.

financial improvements when times are good. Brickley and Van Horn (2002) find that many hospital CEO contracts include rewards for good financial performance. More recently, Brickley, Van Horn and Wedig (2009) find that hospital CEO pay increases with exogenous increases in hospital profits and yet is insulated from downturns when CEOs are voting members of their boards.

2.3 Debt Financing in Commercial Nonprofits

Commercial NPOs use debt financing to finance capital formation, just as corporate entities do. There are several reasons why NPOs utilize debt financing, including a tax subsidy that is associated with municipal finance (Wedig, 1996). As a result, the use of debt financing is widespread in the NP sector. Both NP hospitals and universities use long term debt in ratios that approximate those found in the corporate sector. The widespread use of debt is also relevant to the study of governance. Debt financing may be used to substitute for donations in the acquisition of fixed capital. This may benefit donors in that debt service payments can help to alleviate the nondistribution constraint during periods of high profits. Finally, and perhaps most importantly, reliance on debt financing may discipline insider decisions in cases where insiders dominate governance

2.4 The Non-Distribution Constraint and Internal Expenditures

A hallmark of the nonprofit form is the nondistribution constraint and the retention of financial surplus. My model assumes that *both* donors and insiders benefit from the expenditure of retained surplus (e.g., there is not a choice of perquisite consumption *versus* quality provision). The motivating idea is the following. Insiders use retained surplus to finance a range of activities that provide them with a private benefit. For example, retained surplus in a university can finance research on the part of the faculty that provides them with both "psychic utility" as well as a valuable reputation that may enhance their wage or outside compensation. Crucially, the activities that provide insiders with a private benefit also serve a public purpose. For example, insider activities such as faculty research or "cutting edge" physician services may also be valuable to donors and the community and may constitute the rationale for philanthropic support of these organizations. These activities may not be supplied under the profit motive for a variety of reasons, the most obvious one being that it is not possible to capture the public benefit as revenue. However, they are still valuable in that they provide both an insider as well as a donor benefit. In this sense insiders and donors share a symbiotic relationship in that the internal expenditure of economic surplus creates both a private as well as a public benefit. This assumption obviates the need to model conflict and tradeoffs in how the residual is spent.

2.5 Compensation and Compensating Differentials

The private benefits enjoyed by insiders are part of their compensation, providing a "compensating differential" that reduces their required cash compensation. There is empirical evidence that supports the argument that employees earn less cash compensation when employed at a nonprofit compared to a for-profit organization (Preston, (1988)). I build the idea of a compensating differential into my model, consistent with the existing evidence[6].

3. The Basic Model

I consider a nonprofit organization that produces a commercial product that also provides a public benefit that is valued by donors. Two prominent examples are education (e.g., private universities) and health care services (e.g., nonprofit hospitals). For example, a private university produces research and education. This output provides a private benefit for

[6] The assumption of a compensating differential is important. One concern in a model of donor control is that donors will fail to internalize private benefits enjoyed by insiders and will thus take actions that lead to the undersupply of economic surplus. This need not be the case if donors are able to reduce cash compensation as insider employees enjoy a compensating differential that results from such surplus.

which students (or their parents) pay tuition. In addition, donors perceive a "psychic benefit" from this output because they value an educated population and the advancement of knowledge. This elicits donations[7].

I model the actions of two economic actors: a single donor, D and a single employee, I (referred to henceforth the "insider"). Either party may control the organization in a sense that I make clear below.

Donor utility is additively separable in "psychic utility" and disposable income. "Psychic utility" is increasing in the both the *scale* of the organization's activities, s, (e.g., number of hospital beds, number students enrolled) as well as the organization's *economic surplus*, θ, whose internal expenditure enhances the public benefit ("mission")[8]. Intuitively, the donor gains psychic utility from a large organization whose characteristic activities are well-funded. The donor also supplies donations which are netted out of her wealth, giving utility of the form,

$$U^D = U(s,\theta) + Z,\ (\mathrm{U}_{\mathrm{s}} > 0, U_{s,s} < 0, U_{\theta} > 0, U_{\vartheta,\vartheta} < 0, U_{s,\theta} = 0.) \qquad (1)$$

where $Z = \bar{z} - d$, $\bar{z}$ is (exogenous) donor wealth and d equals donations[9]. I assume (for now) that psychic utility is concave in its two arguments and that there is a zero cross-partial between organizational scale and surplus. Furthermore, donations are not contractible, ex ante[10].

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[7] There are several theories of donative behavior, only some which argue that donors directly care about the public benefits of a nonprofit's activities (other theories emphasize, for example, a "warm glow" that the individual receives from donating (Andreoni, (1990)). My results do not require that donors directly care about the public benefits that are created, but only that donations are increasing in the organization's financial deficit as defined below.

[8] Note that if the donor did not value retained economic surplus (spent internally), she could enjoy equal utility by donating to a for-profit form. In what follows, I assume that economic surplus is expended on a predetermined (exogenous) set of organizational activities (e.g., research).

[9] I note that linearity in income rules out income effects in the provision of donations in the sense that exogenous shifts in donor income do not affect the donations decision. This is done for simplicity. I consider the implications of relaxing this assumption below in section 4.

[10] Thus, for example, donors cannot contract with an insider board to change its governance decisions in return for ex post donations.

I also assume that:

$$U(s,0) = 0 \quad \text{(1a)}$$

to capture the idea that nonprofit organizations that are forced to operate with no economic surplus cannot carry out their "mission."

The insider receives utility from her wage income, w, as well as the organization's economic surplus, the expenditure of which confers a private benefit to the insider (see discussion in the previous section). Insider utility is,

$$U^I = w + \alpha\theta \text{ where } 0 < \alpha < 1, \quad (2)$$

where w is wage income. I assume that insiders derive less than a dollar of benefit from each dollar of economic surplus (they would prefer to extract the surplus in the form of wages.) Both insiders and donors are assumed to be risk neutral.

The actions of the two parties are modeled using a 3-stage framework. (See figure 1). As an initial condition of the problem, control of the board is granted to D or I (at time zero). At time 1, the board commits to a scale of operations, s. Units of scale are financed by entirely with debt such that $s = b$ where b is the amount borrowed. For convenience, I assume an interest rate of zero on riskless debt so that debt service consists of $1 for every dollar borrowed. I also assume that the committed level of scale is public knowledge.

Next, the board selects a state-contingent wage contract of the form $w = \bar{w} + \delta Y$ where Y is the organization's gross income *before* payment of debt expenses, and receipt of donations. The selected contract must provide expected *cash* compensation that is less than or equal to a regulatory limit w^R [11]. In addition, the selected wage rate, plus the compensating differential that insiders enjoy from retained economic surplus, must be greater than or equal to an outside

[11] This regulation has obvious relevance in cases where insiders control the board and set their own compensation.

Figure 1: Model Sequence of Decisions and Actions

Time 0	Time 1	Time 2	Time 3
0.1 Governance granted to I or D	1.1 Board selects capacity (s) and borrows b = s ("s" becomes public knowledge)	2.1 Nature chooses (H,L)	3.1 Revenues realized
	1.2 Board Selects insider compensation $(\bar{w},\delta)$	2.2 If state = L, D decides whether to donate or not	3.2 Compensation paid
	(Subject to market and regulatory constraints)	2.3 If D donates then	3.3 Debt service paid
		d>= s(1-r^L)	
			3.4 Donor utility realized (if debt service fully paid)

market option, w^m. I will assume, in what follows, that it is possible for boards to pay the market standard, w^m, without violating the regulatory limit, w^R [12].

Next, at time period 2 (i.e., middle of the period), donors and lenders receive an identical informational signal about the (eventual) profitability of the organization's commercial operations. Two states of nature may prevail, "high" or "low" with ex ante likelihoods $(p,(1-p))$. End of period gross income (*before* the payment of wages and debt service and before receipt of any donations) is given by,

$$R^i = s * r^i \quad i = (H, L) \qquad (3)$$

If the state of nature is "high", then commercial operations are sufficiently profitable to pay debt service and debt is repaid at the end of period 3, when revenues are realized. That is, $r^H > 1$.

If the state of nature is "low", then commercial revenues are insufficient to pay debt service ($r^L < 1$). In this case, lenders may demand a subsidy (donation) from donors to make up the expected difference. If donors renege, then bond holders are permitted to take control of operations (via the bankruptcy courts), while donors realize no utility (because θ is zero in this case – see equation (1a))[13]. Conversely, if donors comply with bondholders' demands, they provide donations greater than or equal to the amount required to pay debt service. Finally, at the end of period 3, conditional on solvency, revenues are realized, managers and bondholders are paid and economic surplus, θ, is expended internally with donors enjoying positive psychic

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[12] Intuitively, if w^R is equal to what insiders could enjoy in the for-profit sector, then nonprofit organization should be able to pay less than this amount to secure labor, given that there is a positive compensating differential enjoyed from the nonprofit's economic surplus. In fact, there is evidence that cash wages in nonprofits are systematically lower than those enjoyed in the corporate sector.

[13] Imagine, for example that the signal implies that a debt covenant is violated which gives bondholders permission to take control unless there is an adequate infusion of revenues.

utility as a result. Under insolvency, mission is not realized, managers are still paid and bondholders receive a partial return of their capital, but donors receive no psychic utility.

Initially, I use the base model to analyze the agency costs that arise from either donor or insider control of the organization. Fama and Jensen argue that insider boards impose agency costs on donors, especially through the appropriation of their donations. Insider boards, it is argued, should therefore be discouraged and donor control encouraged. Relative to this position, I consider a set of related questions. First, are donor-controlled boards fully efficient, given that insiders are also residual claimants over the organization's surplus? Second, where insiders enjoy control, what is the mechanism of donor expropriation, given regulatory controls on wage compensation? For example, to what extent can donors rely upon debt markets to discipline insider boards and hence mitigate this problem?

3.1 The Joint Utility-Maximizing Solution

In order to evaluate the efficiency of alternative governing arrangements, (i.e., control by D or I), it will be useful to have some intuition about the joint utility-maximizing solution, which maximizes the combined utility of D and I.

Given the assumptions over donor and insider utility, expected joint utility can be written:

$$\begin{aligned}\phi &= pU^d(s,\theta^H) + (1-p)U^d(s,\theta^L) - (1-p)d \\ &+ (p)(\alpha)(\theta^H) + p(\bar{w} + (s)(r^H)(\delta)) + (1-p)\alpha(\theta^L) + (1-p)(\bar{w})\end{aligned} \tag{4}$$

The first line in equation (4) measures the utility that donors receive from completion of the organization's mission, net of their expected donations. Realized donor utility is state-dependent, and increasing in both organizational scale, s, as well as economic surplus, θ, which may vary across the states (H,L).

The second line of equation (4) measures expected insider utility. In the "high state" insiders receive a private benefit, α , from each dollar of economic surplus, as well as wage compensation, which consist of both a fixed component as well as a component that is tied to gross surplus. In the "low state," a similar description applies. I will find it convenient to adopt the normalization that $r^L = 0$[14] so that insiders receive only fixed cash compensation in the low state. As a result, wage compensation consists only of the fixed component, $\bar{w}$ in the low state. Economic surplus in the low state is therefore $\theta^L = (d - s - \bar{w})$.

Note that wage compensation is deducted to compute economic surplus, θ. For this reason, wages reduce the private benefits that insiders receive from economic surplus and thus have net marginal value to insiders of $(1-\alpha)$ (not dollar for dollar value). Joint utility is maximized with respect to the choices of $d, \delta, \bar{w}$ and s .

3.2.1 The Joint Utility Maximum

The first order conditions for the maximization of (1) are (respectively)[15]

$$\phi_d = (1-p)(U_{\theta^L} + \alpha - 1) = 0 \quad (5a)$$

[16]

$$\phi_\delta = p(sr^H)(1-\alpha - U_{\theta^H}) = 0 \quad (5b)$$

$$\phi_{\bar{w}} = (1-\alpha) - pU_{\theta^H} - (1-p)U_{\theta^L} = 0 \quad (5c)$$

and

$$\phi_s = (pU_s + (1-p)U_s) + \alpha(r^n - 1) + (1-\alpha)\delta r^n + pU_{\theta^H}(r^H(1-\delta) - 1) + (1-p)U_{\theta^L} = 0 \quad (5d)$$

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[14] My results are the independent of the assumed value of r^L, but this normalization simplifies many of the resulting expressions.

[15] Computations are in Appendix 1. Concavity of the donor utility function in both s and θ insure that second order conditions are satisfied at the optimum.

[16] For convenience I drop the "d" superscript from donor utility in what follows. In all cases, "U" refers to donor utility.

Condition (5a) simplifies to $U_{\theta^L} + \alpha = 1$. Donations are optimally provided up to the point where the marginal cost of donating $1 is equal to the combined (donor and insider) marginal benefit of economic surplus in the low state. The condition for δ (insider cash compensation that is tied to gross profits in the high state) can likewise be written as $U_{\theta^H} + \alpha = 1$. Insiders should be awarded cash compensation in the "high" state up to the point where the marginal value of cash compensation is equal to the combined donor and insider benefit of economic surplus, this time for the "high" regime. Together, these two conditions imply that the marginal utility of economic surplus ***should be equal in high and low regimes*** and hence that the value of economic surplus, θ, should be equal across the two regimes.

Conditional on $U_\theta = (1-\alpha)$, it follows from equation (5c) that $\phi_{\bar{w}} = 0$. Paying marginal fixed wages has no marginal effect on joint utility, at the optimum. Intuitively, this is because income has equal marginal value as retained surplus or cash wages at the optimum, given the way in which d and δ have been selected. Hence fixed wages may be set equal to 0 at the optimum[17].

Finally, substituting $U_\theta = (1-\alpha)$ into (5d) and simplifying yields a simple expression for optimal capacity, s:

$$U_s + r^n = 1 \qquad (6)$$

where $r^n = pr^H$, the *expected* financial return on assets across high and low states.

The result is intuitive and resembles a marginal condition for capital investment outlays. The marginal revenue or return on an additional unit of capacity consists of both psychic value

[17] The joint maximum may also be realized by setting fixed wages greater than zero, reducing δ and increasing donations so that the condition $U_\theta = (1-\alpha)$ continues to hold. In this sense, fixed wages are merely a device for re-allocating wealth between donors and insiders and their level does not affect joint utility.

and financial return. This combined "return" is equated to the marginal cost of a unit of capacity. It is noteworthy that the expected financial return to capacity, r^n, is valued "dollar for dollar" and not discounted, in spite of the non-distribution constraint. Intuitively, this is because the internal and external values of income are equal at the optimum, because I have not imposed any restrictions on the level of external compensation. In other words, I have effectively assumed (up to this point) that the non-distribution constraint does not bind in the optimal solution.

To summarize, the unconstrained joint utility-maximizing solution has (3) key properties:

1) income has equal marginal value, whether expended internally or paid out as cash externally – the optimal levels of donations and wage compensation are allowed to expand or contract to ensure this result;

2) the insider compensation policy parameter, δ, is used to equate economic surplus income in the two states of nature and;

3) capacity, s, is selected such that its combined marginal financial and psychic return is set equal to the marginal cost of capital (capacity).

3.2.2 Non-Distribution Contraint Binds

It will also be useful to analyze the joint optimum in cases where the non-distribution constraint (NDC) is active (a "second best" solution). For our purposes, this occurs where δ is constrained to be below the value that would extract sufficient surplus from the high regime (in the form of insider cash compensation) such that equation (5b) holds. In this case, economic surplus in the high regime is constrained to be "excessive" and has marginal value less its alternative value in the form of wages. Thus, the NDC is equivalent to holding cash wages below their optimal level in my model.

It is easily shown[18] that the optimal conditions for donations and fixed wages are unchanged. However, the condition for optimal capacity becomes,

$$U_s = (1 - r^n) + (1 - \alpha - \mu)(p^H)(r^H - 1) \quad (6a)$$

where $\mu = U_{\theta^H}$, the donor's marginal utility of surplus, and $(\alpha + \mu) < 1$.

Note that the condition is identical to (6) in the case where $(\alpha + \mu) = 1$. However, when the NDC binds, $(\alpha + \mu) < 1$ and optimal capacity is lower than in the unconstrained case. Intuitively, where the NDC binds, donors and insiders are the joint residual claimants over surplus in the high regime. When joint value is equal to 1, the result is the same as before, where I had assumed surplus could be freely extracted. When the joint value of surplus is less than one, this must be accounted for in the choice of s, and a value of capacity is selected to account for the reduced value of surplus in the high regime. This reduction in value is reflected in the second term on the right side of (6a).

3.3 Donor Governance

I now consider the efficiency of donor governance relative to the joint utility maximizing result. Several factors affect the relative efficiency of donor governance. First, donors will undersupply donations because they are non-contractible. The reasoning is as follows. Donations provide benefits to both donors and insiders, but donors fail to internalize the insider benefits from their donations unless these benefits enable donors to reduce cash compensation to insiders. However, the non-contractibility of donations (which are given at the end of the period) means that donors cannot promise higher donations in return for lower wages and this in turn leads to the undersupply[19].

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[18] See Appendix 1.

[19] This result offers some rationale for subsidizing donations using the tax code, to the extent that joint utility maximization is a concern on society.

More interesting perhaps, is the question of whether donor boards will undersupply capacity, s. Intuitively, undersupply may result to the extent that donors are not full residual claimants over economic surplus. For example, donors may have the view that marginal assets generate costs for them in the low state, but only psychic benefits in the high state, where earnings must be expended internally. However, economic surplus also generates private benefits for insiders. The question of undersupply hinges on the extent to which donors may internalize insider benefits because they must recruit insiders in the labor market.

To analyze these issues, consider the donor's objective function:

$$\max \phi = pU(s,\theta^{H}) + (1-p)U(s,\theta^{L}) - (1-p)d \quad (7)$$

The objective function is (again) maximized with respect to donor choices over donations, d, compensation ($\bar{w},\delta$) and capacity, s. The maximization is subject to a market constraint over insider compensation. I make the reasonable (but important) assumption that the market compensation constraint incorporates the compensating differential that insiders enjoy from the organization's retained surplus. Designating the competitive market level of compensation as w^{m}, this constraint can be written,

$$\bar{w} + p\delta r^{H} + \alpha(p(\theta^{H}) + (1-p)E(\theta^{L})) >= w^{m} \quad (8)$$

Note that the compensation constraint incorporates expected surplus and, by extension, the known value of capacity, s, and the expected value of donations.

The problem can be solved by using the compensation constraint to eliminate $\bar{w}$ in the equations for θ and by then optimizing over the remaining three variables, noting the dependence of $(\delta, \bar{w})$ on the choice of s[20]. I solve the problem first, for the case where the non-distribution constraint does not bind. A complete derivation is provided in Appendix 1.

The simplified results are:

$$U_{\theta^L} = 1 \quad (9a)$$

$$U_{\theta^H} = (1-\alpha) \quad (9b)$$

and

$$U_s = (1-r^n) \quad (9c)^{21}$$

It is clear (by inspection) that under donor governance, where the NDC does not bind: a) for positive values of α, donations are set below their joint utility maximizing values, b) cash compensation in the high state is set efficiently, with cash paid out to the point such that its external value ($1) is equal to the combined marginal value of economic surplus $(U_{\theta^H} + \alpha)$; and c) capacity is set at its efficient level (i.e., compare equation (9c) to equation (6). Thus, the first finding of the model is that *where the non-distribution constraint does not bind, donor governance is efficient save for the under-provision of donations in the low state* (which could be presumably be "corrected" by subsidizing donative behavior through the tax code).

The efficient provision of capacity is a noteworthy result. Intuitively, the fact that positive returns are enjoyed only in the high state does not impede donor decisions over capacity. Adjustments in δ can be used to "transfer" funds from the high to the low regime[22]. In this sense, donors remain as residual claimants of the financial returns to capacity decisions and therefore contract for the efficient level of capacity.

[20] See Appendix 1 for the full solution.
[21] This result is conditional on donors enjoying non-negative net utility in the low state. See Appendix 1 for a discussion of this issue.
[22] That is, as δ is increased fixed compensation (in the low regime) may be decreased, thus effectively transferring funds from the high to the low state.

3.3.1 Donor Under-Supply of Capacity Where the NDC Binds

In a simple extension of the model, donors will under-supply capacity. Here I consider the plausible case in which the non-distribution constraint binds, leading to the condition

$$(U_{\theta^H} + \alpha) < 1 \quad (10)$$

Here, all insider cash compensation occurs in the high regime, and condition (10) holds. In this context, I consider whether capacity is set at its 2nd best level (i.e., consistent with equation 6c).

The solution for capacity in this case becomes[23]:

$$U_s = (1 - r^n) + (1 - \frac{(\mu)}{(1-\alpha)})(p)(r^H - 1) \quad (11)^{24}$$

A comparison of (11) with (6a) shows that donors undersupply capacity relative to the second best in this case, whenever the NDC constraint binds and $\alpha > 0$. Intuitively, when the NDC binds, donors attach value to marginal economic surplus in the high regime only to the extent that they gain "psychic" benefit from it (μ >0). The value of marginal surplus as a means to satisfy the insider compensation constraint and reduce donations evaporates when the NDC binds because, by assumption, there is no device for converting an increase in surplus in the high regime into a reduction in wages and hence needed donations in the low regime (this would require an increase in δ which is already at its limit).

Where μ is small, the surplus has little value to donors, unlike in the joint optimizing case where both μ and α are considered. This leads the donor to undersupply capacity, relative to the second best case, especially where μ is small and α is high. The greatest inefficiency would occur, for example, where the NDC binds, donors are in control, insiders gain significant private benefits from surplus, but where donors gain little or no marginal

[23] Again, see Appendix 1.
[24] Again, see Appendix 1 for a full derivation.

psychic utility from the same surplus. This is the second finding of the model. *Where the NDC binds, donor boards will undersupply capacity with the inefficiency effect increasing in* α *, the marginal private insider benefit of surplus, and decreasing in* μ *, the donor psychic benefit of surplus.*

3.4 Insider Governance

Next, I consider the alternative of insider governance. Insiders have an incentive to expropriate donors by investing excessively in capacity. This is because insiders enjoy the "upside" of marginal capacity and can often rely upon donors to make up losses in the low state.

The key finding in this section is that this agency cost may be addressed through reliance upon debt markets for capital financing. Debt markets will not supply insiders with capital on favorable terms, without a reasonable assurance of repayment. This, in turn, requires insiders to moderate their acquisition of capacity to a level that donors will support. It may also cause them to increase insider compensation in the high regime in order to insure solvency in the low regime.

Consider the problem formally. Where insiders control governance, insiders select s and δ (with $\bar{w}$ determined as a residual of the regulatory constraint on compensation) while donors still select donations at the end of the period. Total expected cash compensation is set equal to the regulatory constraint.

A formal statement of the problem is[25]:

$$\text{Max } \phi = \bar{w}(1-\alpha) + p(\alpha)(s)(r-1) + p(1-\alpha)(s)(\delta)(r) + (1-p)\alpha(d-s) \quad (12)$$

Subject to:

$$w^r = \bar{w} + (p)(s)(\delta)(r) \quad (13a)$$

[25] A full derivation is again provided in Appendix 1.

$$U_{\theta}^{L}(d)=1 \text{ if } U(s,\theta^{L}) >= \theta^{L}+s+\bar{w},\ d=0, \text{ otherwise. (13b)}$$

Note that equation (13b) expresses a constraint over donative behavior. Donations are supplied by donors up to the point where their marginal benefit is equal to their marginal cost (to donors), but only if net donor utility is (weakly) positive at this point. Otherwise donations are zero. In Appendix 1, I show that the zero net utility constraint is binding at the insider's optimal solution, implying that donors enjoy zero net utility in the low state. Insiders, in essence, select among points on the donor's zero net utility curve in the low state.

Next, define "f" as the value of realized economic surplus such that $U_{\theta^{L}}=1$. Thus, if donors choose to donate, $\theta^{L}=f$ and d = (f+s+$\bar{w}$). Substituting (13a) for $\bar{w}$ and (f+s+$\bar{w}$) for d, allows me to restate the donor problem as:

$$\text{Max } \phi = w^{r}(1-\alpha)+p(\alpha)(s)(r-1)+(1-p)\alpha(f+w^{r}-p(s)(\delta)(r)) \quad (14)$$

$$\text{subject to } U(s,\theta^{L})=\theta^{L}+s+\bar{w} \quad (15)$$

The optimization in the restated ("concentrated") problem is over (s, δ). Given that s is selected before δ, the parameter δ is used to satisfy the zero net utility constraint, conditional on the chosen value of s. I note that the value δ that is required to satisfy the zero utility condition, conditional on s, is:

$$\delta=0 \text{ if } (f+s+w^{r}) <= U(s,f) \quad (16)$$

$$\delta=\frac{(f+s+w^{r}-U(s,f)}{(p)(r)(s)} \text{ otherwise.}$$

With the equation for δ in hand, the problem reduces a choice of s alone, subject to the expression for δ (equation 16), which depends on s. The derivative of donor utility with respect to s is:

$$\phi_s = \alpha[(p)(r-1)-(1-p)(p)(r)(s)\delta_s] \quad (17)$$

This derivative is strictly positive for values of s such that $(f+s+w^r)<U(s,f)$ because $\delta_s = 0$ over this range. The derivative is also discontinuous at the point where $(f+s+w^r)=U(s,f)$ because δ_s is discontinuous at this point. This leads me to conclude that the insider choice of s is implicitly defined by the condition $(f+s+w^r)=U(s,f)$ if (17) is negative at the point where the zero net utility condition holds as an equality. Otherwise the insider choice of s is defined by the first order condition,

$$\alpha[(p)(r-1)-(1-p(p)(r)(s)\delta_s]=0 \quad (18)$$

where

$$\delta_s = \frac{-(U_s s + f + w^r - U(s,f))}{r^n s^2} \quad (19)$$

These results also allow me to characterize the insider's choice of s relative to the joint optimizing solution. I note that, at the point where $(f+s+w^r)=U(s,f)$

$$\phi_s = [(1-p)U_s - (1-r^n)] >< 0 \quad (20)$$

Consider the case where (20) is negative at the point where donors enjoy zero net utility, so that capacity is implicitly defined by the zero net utility condition. From inspection of (20) in comparison to (6), it is apparent that (20) may be negative at values of s that are greater, less than or equal to the value of s that satisfies (6)), the joint optimizing value. This provides me with my third main result: *the insider choice of s may be greater then, less than or equal to the joint utility optimizing value of s*[26].

[26] I also note that in cases where (20) is positive at the point where $(f+s+w^r)=U(s,f)$ that s is determined by (18) and s will be undersupplied relative to the joint optimum.

To develop some intuition about this result, it helps to consider the concavity of the donor utility function. That is, define k as a "concavity parameter" in the sense that at the efficient level of s,

$$U_s(s,\theta)(s)(k) = U(s,\theta) \quad (21)$$

Given (weak) concavity, k>= 1. Then it follows from results above (as well as equation (6)) that that insiders will supply the efficient level of capacity iff[27],

$$k = 2 + \frac{(\theta^L + w^r)}{s(1-r^n)} \quad (22)$$

For values of k greater than this (more concavity) insiders will oversupply capacity relative to the optimum and vice versa[28]. Intuitively, highly concave donor utility functions are functions where the marginal value of s declines quickly relative to the average value of utility. Since the optimal value of s is determined at the margin, and insider values are selected so that average of utility is zero, oversupply of capacity results in the case of highly concave donor utility functions.

What is the meaning of concavity in donor utility? Extreme concavity may occur where donors have a discrete purpose in mind and receive little psychic utility from achieving scale beyond the level needed to meet this purpose (e.g., a hospital that provides services for its local population only, but where donors assigns little utility to expanding services to potential patients outside of the community). The opposite case would be where donors gain utility from

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[27] This equation is obtained by substituting (21) for U in the equation $(f + s + w^r) = U(s, f)$, solving for U_s and then setting the result for U_s equal to the right side of (6).

[28] A similar result holds for the case where the NDC binds insider choices of δ. In this case, optimal capacity is governed by equation (6a) and insiders supply this level of capacity iff:

$$k = \frac{1}{(1+\psi)}[2 + \frac{(\theta^L + w^r)}{s(1-r^n)}] \quad (17)$$

where $\psi = (1-\alpha-\mu)p > 0$.

unlimited growth of the nonprofit, as in cases, for example, where the organization may serve a national market and where donors seek to achieve a national reputation for the organization.

Figure (2) illustrates two examples, where the insiders may select capacity i) above the joint optimum (Figure 2a) and ii) below the joint optimum (Figure 2b). In the cases where donor utility is highly concave, the zero net utility point occurs to the right of the efficient point and vice versa where donor utility is less concave. (Note that the optimal value of "s" is the same value in both graphs).

Finally, I can also consider other properties of the insider solution, again, relative to the joint utility optimum. Consider, first, the issue of compensation as reflected in the choice of $(\bar{w}, \delta)$. Efficiency requires that compensation in the high regime be such that $U_{\theta^H} + \alpha = 1$ holds. Given that insiders always set aggregate compensation equal to w^r, it is clear that for any selected value of δ, (by insiders) there exists some value of w^r that makes this hold. In this respect, the achievement of compensation efficiency can be achieved through regulatory policy.

Regarding donations note, first, that the expression for donations is identical to the case of donor governance and is hence inefficiently low, conditional on optimal capacity. Again, policies that encourage donations at the margin (e.g., tax deductibility) may be used to address this problem.

In summary, insider controlled boards are disciplined by debt markets in their capital decisions. They may oversupply capacity relative to the joint optimum if donor utility is sufficiently concave, but will still be constrained by the requirement that net donor utility be equal to zero in the low regime.

Figure 2a: Insiders select capacity above the optimal value

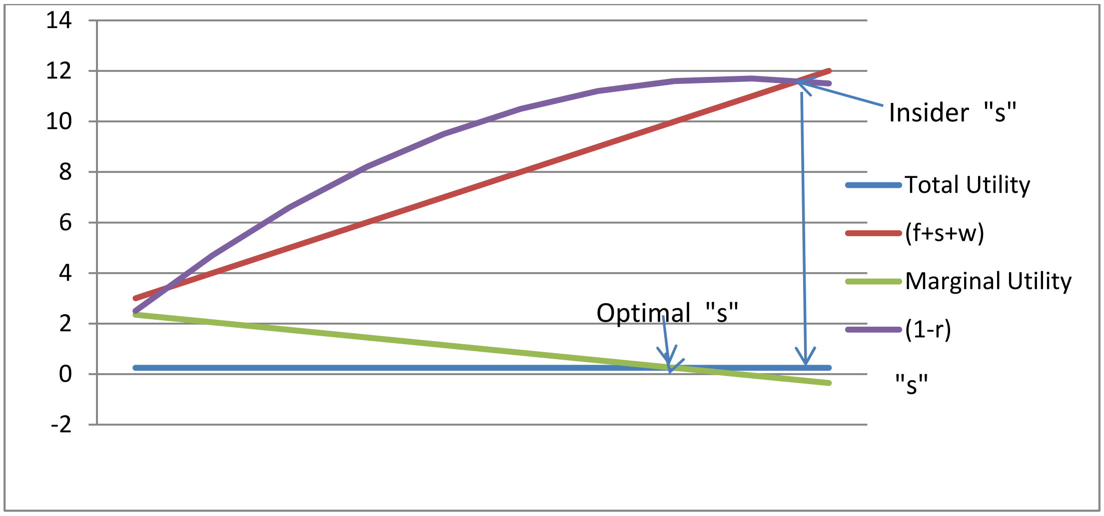
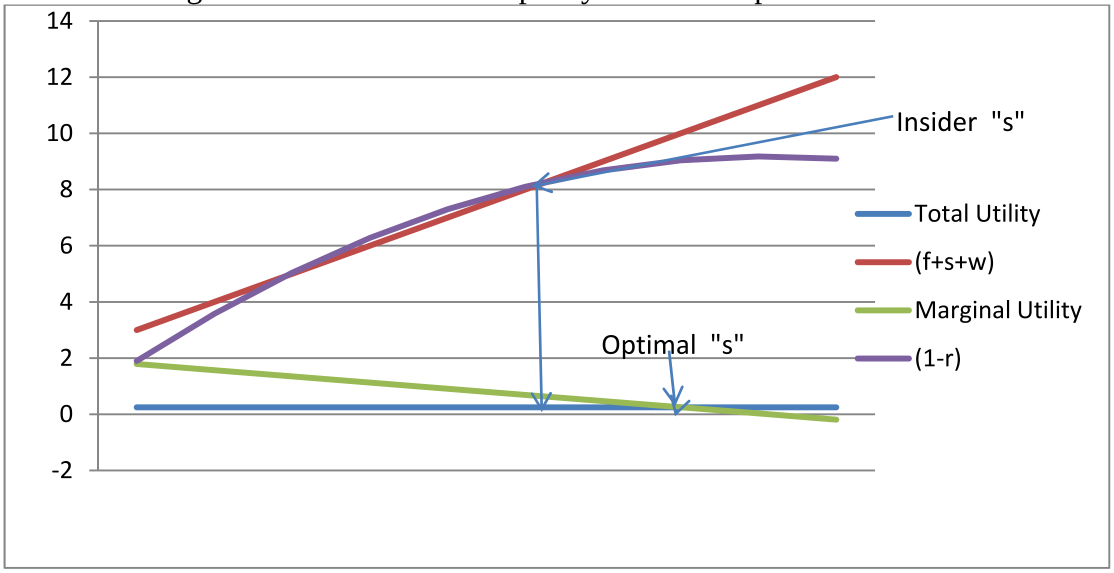


Figure 2b: Insiders select capacity below the optimal value



4. Model Extensions

In this section, I consider two extensions to the model, in order to test (and demonstrate) the robustness of the main results. The extensions include the following: 1) incorporating multiple periods and a possible savings outlet for economic surplus (i.e. incorporating an "endowment") and 2) incorporating an "income effect" in the donations function such that donations are an increasing function of donor income (and a decreasing percentage of any organizational deficit). Key results are summarized below while more formal derivations are available from the author.

4.1 Multiple Period Extension – A 2-Period Model

Nonprofit boards arguably do not have an *infinite* decision horizon. Board members have finite personal horizons. Moreover, there are no alienable financial claims to the nonprofit's residual, so that board members cannot personally reap the benefits of decisions that have deferred financial implications. However, nonprofits *do* hold endowments and other stores of wealth that they contribute surplus towards. It is evident that the governing parties make decisions from a multiple-periods perspective. A finite, multi-period model may be the most appropriate way to model board conduct.

As a first step towards modeling governance decisions from a multiple periods perspective, a simple two-period extension can be introduced. Under the two-period model the same assumptions apply (from Section 3), period by period, with the following small modification: at the end of period 1, the organization may contribute some of its surplus to a savings account (endowment) that must be fully expended at the conclusion of the second period. Capital (capacity) fully depreciates after each period. Furthermore, I assume that the NDC may bind in either or both periods.

The availability of the savings option in period 1 has the following effect. It provides an outlet for funds that would otherwise need to be spent internally on "mission" activities whose marginal utility is less than a dollar. The ability to save the funds and perhaps spend them at a later date (where they are more valuable) enhances their value. This, in turn, may help to encourage investment in capacity.

Consider, first, the case of donor governance. The results from the two-period model are divided into (4) separate sub-cases, depending upon whether the non-distribution constraint binds in either or both of the two periods.

Case 1: NDC does not bind in either period

In this case, it is easily shown that the multi-period problem reduces to a series of one-period problems as described in the previous section. An insider board will not save any economic surplus after the first period, because its marginal value in the first period ($1) is equal to its value in the second period (also $1). As shown in the prior section, donor governance leads to an efficient choice of capacity in this case.

Case 2: NDC binds in both periods

In this case the choice of capacity remains inefficiently low in period 2. However, at the end of period 1, the board will siphon off some of the surplus enjoyed in the high state to be used during period 2. The reasoning is that the expected value of surplus in period 2 is greater than its conditional value in the high state of period 1. The value is greater in period 2 because there is some likelihood that it will be needed in the low state, where its marginal value is $1. As a result of the ability to "siphon off" excess surplus in period 1 into more valuable uses, the marginal value of surplus in period 1 increases. However, it remains below $1 because the expected value of surplus in period 2 remains below $1. For this reason, capacity remains inefficiently low in period 1, but not as inefficiently low as depicted in the one-period model. Capacity also remains below its optimal value in period 2.

Case 3: NDC binds in period 1 but not period 2

In this case, it is easily shown that all inefficiencies are removed. If the NDC does not bind in period 2, then surplus in the high regime in period 1 is "saved" up to the point where $(\alpha + \mu) = 1$. Thus, any surplus created is valued dollar for dollar and as a result, capacity is acquired up to the efficient level in both periods.

Case 4: NDC binds in period 2 but not period 1

This case just reduces to the single period results, once again, in which the NDC binds.

In short, multiple period considerations may alter the single period results in the following way. If the NDC binds in period 1, then the possibility of using surplus in the future may reduce the resulting inefficiency both in expenditures and capacity, under donor governance.

Next, consider (briefly) the case of insider governance. To understand the effects of dynamics (multiple periods) on insider governance, it suffices to pose a simple question: how will insider decisions change, if at all, given that there is an option to spending surplus in a future period? The ability to save \$1 economic surplus for later periods implies that insiders can: a) enjoy private benefits from \$1 surplus in the later period, in the high state only; and b) acquire one additional unit of capacity while maintaining the constraint,

$$(f + s + w^r - e) <= U(s, f)$$

which also provides a benefit in the high state only. The net benefit (in the future period) is $\alpha p(1 + (r^H - 1)) = \alpha r^n < \alpha$.[29] This is a smaller benefit than would be enjoyed if the surplus were consumed today. Thus, dynamics do not change insider governance practices.

In sum, dynamics may serve to reduce the inefficiencies of donor governance while having no effect on insider governance.

[29] The result depends, it should be noted, on a constant and unchanging private benefit value of α. In cases where the private benefit is declining with the level of economic surplus, another result would be possible.

4.2 Donor Income Effects

I also consider the case in which donations are sensitive to the level of donor income. Formally, I now assume that donor utility is concave in dollars expended on consumption. This implies, among other things, that a) donations are an increasing function of (exogenous) donor income; and b) that donors fund only a "fraction" of any increase in investment and fixed wage obligations in the low regime. In addition, I now assume that the marginal return to capital investments in capacity are a decreasing function of capacity. I also work with a quadratic approximation to utility to make the problem tractable.

In this case, insiders work on a different margin than before in considering optimal capacity. Instead of operating along a zero utility constraint, insiders bear a fraction of the cost of additional capacity in the low state, as reflected in lower values of economic surplus (in the low state) that result from marginal increases in capacity. The question is whether any of the qualitative results from section 3 change as a result of this adjustment in the model, in which insiders are now partial residual claimants in the low state.

The results for the joint optimizing values of the choice variables are unaffected by this model modification. Moreover, insider choices for compensation policy and capacity are qualitatively the same as before. The optimal value of δ is zero, because the overall compensation is strictly regulated and increases in δ have the net effect of reducing donations available for economic surplus. As before, the level of donor-chosen capacity, in relation to the joint optimum, remains ambiguous. Capacity will be oversupplied by insiders if utility is sufficiently concave in s, as before.

There is one small change in the case of donor governance. In this version of the model, donors will undersupply capacity even where the NDC does not bind. Intuitively, "income effects" in donations cause donors to squeeze economic surplus in the low state to inefficiently low levels. This imposes a cost on donors, who must increase compensation levels to retain insiders. To alleviate this inefficiency, capacity is reduced.

5. Comparative Statics and Empirical Predictions of the Model – The Conduct of Insider Versus Donor Boards

This section focuses on the empirical predictions that may be inferred from the model. Focusing on the endogenous variables of the model, including scale (capacity), insider compensation, retained surplus and donations, I describe differences between donor and insider boards. I discuss cross sectional differences in these variables as well as differences in the exogenous drivers of these variables.

5.1. Scale and Leverage

My model does not make unambiguous predictions about the relative scale or capacity chosen by donor and insider boards. Scale may be undersupplied by donor boards relative to the joint optimum, but the same may be said of insider boards (who may also oversupply capacity relative to the joint optimum). For cases in which donor utility is sufficiently concave, capacity will be oversupplied by insider boards relative to donor boards.

However, consider the partial effects of exogenous variables such as: a) the expected profitability of commercial assets; b) the level of private benefit that insiders assign to economic surplus; c) the probability of the low state, given expected returns (a measure of "risk"); d) the extent to which the NDC "binds." Imagine the following thought experiment. In a regression of a sample of commercial NPs' scale (and leverage), what would the partial effects of these exogenous measures be and how would their partial effects vary across subsamples with insider and donor boards?

Intuitively, my model argues that *donor boards* carefully assess the financial consequences of adding scale because they are, in part, focused of on meeting a compensation constraint for talented insiders and are also more committed to moving funds across states of nature. For this reason, a marginal dollar generated by an investment in the high state is weighed carefully against potential losses in the low state. For insiders, on the other hand, the main driver(s) of marginal capacity are factors that enable debt financing to be obtained on favorable terms, such as stronger commitments of the donor to the organization.

More formally[30], the expected financial return on capacity will affect capacity under donor boards, increasing capacity where the NDC constraint does not bind[31] while having no marginal effect on the capacity decisions of insider boards. Likewise marginal increases in the private benefit of economic surplus will causes donor boards to increases capacity, but only where the NDC binds, and will have no effect on the capacity decisions of insider boards.

Holding the expected return to capacity fixed, donors will also invest more in capacity as the variability of the return decreases, provided , again that the NDC binds. Intuitively, donors would like to have returns "spread out" where the NDC binds. Likewise, insiders will be more likely to acquire capacity where returns are higher in the low state[32]. In this sense, insiders also desire less risk, (holding expected returns fixed), but their focus is on the negative tail of the distribution only, because this is the region in which capacity decisions are determined.

5.2 Compensation and Surplus

My model also predicts that compensation and economic surplus will differ across donor and insider organizations. Donor boards will pay at the market rate whereas insiders

[30] The statements that follow are verified formally. Results are available from the author.

[31] If the NDC binds, it is possible that increases in r^n will decrease s because the marginal utility of economic surplus in the high regime is decreasing in r^n.

[32] For simplification, I have assumed that returns are always zero in the low state. I refer here to a generalization where returns in the low state may be non-zero. In this case, higher returns in the low state will stimulate capital acquisition within insider boards but have no such effect on donor boards.

will pay the regulatory rate[33]. In addition, donor boards make compensation state-contingent, with higher compensation paid out in the "high" regime, while insider boards resist this practice. State contingent compensation is a way to reduce donations in the low state. On this specific matter, donors and insiders differ. Finally, given these results, there is likely to be more economic surplus and hence organizational expenses in the high state in insider compared to donor organizations.

5.3 Donations

Finally, my model argues that donations will be greater under insider governance, provided capacity is held constant. This because insiders do not internalize the costs of donations and take steps to increase donations, such as keeping compensation high in the low regime for force greater donations.

6. Discussion and Conclusion

Many existing theories of NP *conduct* (not existence) are based upon somewhat ad hoc assumptions regarding decision rights and governance. These theories are not grounded in the general agency cost theory of the firm or tied to well-defined residual claims. The premise of this paper is that it is neither necessary nor wise to discard the concept of residual claimancy in formulating theories of nonprofit conduct and governance.

The benefits of this approach are demonstrated in the preceding model, which uses the idea of "de facto" residual claimancy. The resulting contributions are two-fold. First, I am able to take up the question of which party (insiders versus donors) should optimally be given control of governance. Here, I am able to show that neither insider nor donor governance is likely to achieve a joint optimizing result. Donor boards may undersupply capital (capacity) and fail to fully consider the insider benefits of marginal capacity in cases where the NDC

[33] There is empirical evidence to support this prediction.

binds. The problem is most acute where insiders gain significant benefits from the economic residual. Conversely, insider boards may exploit strong donor commitments to an organization in order to over-expand capacity. Insider boards will also try to retain economic surplus inside the organization in favorable financial states instead of paying it out as state-contingent compensation.

The model also has practical empirical implications. The model predicts differences in compensation policy and donation levels across donor and insider boards. The model also predicts that capital acquisition will be affected, at the margin, by typical financial drivers such as risk and the expected rate of return where donors control governance, but less so where insiders control governance.

Finally, my model may also have other applications, not fully explored at this point. A careful analysis of the results in section 3, on the optimality of alternative governance arrangements, may be the basis for empirical predictions of donors versus insider control. Such an extension of the basic model would need to incorporate new assumptions about the market for corporate control among nonprofits.

References

Andreoni, J., 1990, Impure altruism and donations to public goods: a theory of warm glow giving, Economic Journal, 100(401), 464-477.

Ballou, J. and B. Weisbrod, 2003, Inferring behavior of nonprofit and governmental organizations from managerial rewards: an application to the hospital industry, Journal of Public Economics, 2003.

Bergstrom, T., Blume, L.,Varian, H., 1986. On the private provision of public goods. Journal of Public Economics 29, 25–50.

Brickley J. and R. L. Van Horn, (2002), Managerial Incentives in Nonprofit Organizations: Evidence from Hospitals, Journal of Law and Economics, 45, 227-249.

Brickley, J., Van Horn, R.L., and G. Wedig, Board Composition and Conduct: Evidence From Hospitals, working paper, 2009.

Easley, D., O'Hara, M., 1983. The economic role of the nonprofit firm. Rand Journal of Economics 14, 531–538.

Eldenburg, L., Hermalin, B., Weisbach, M. and M. Wosinska, (2001), Hospital Governance, Performance Objectives and Organizational Form, NBER Working Paper 8201.

Erus, B. and B Weisbrod, (2003), Objective functions and compensation structures in nonprofit and for-profit organizations, In: Glaeser, E. , ed., The Governance of Not-for-Profit Organizations, The University of Chicago Press, pp. 117-142.

Fama, E. and M. Jensen, (1983a), Separation of Ownership and Control, Journal of Law and Economics, 26, 301-325.

Fama, E. and M. Jensen, (1983b), Agency Problems and Residual Claims, Journal of Law and Economics, 26, 327-349.

Glaeser, E. (2003) The Governance of Not-for-Profit Organizations, The University of Chicago Press, Chicago, IL.

Glaeser, E. and A. Shleifer, *Not-for-Profit Entrepreneurs*, Journal of Public Economics 81 (2001) 99–115.

Hansmann, H., (1980), The Role of Nonprofit Enterprise, Yale Law Journal, 89, 835-901.

Hansmann, H., 1990. Why do universities have endowments? Journal of Legal Studies 19, 3–42.

Hansmann, H., The Ownership of Enterprise, Harvard University Press, Cambridge, 1996.

Herzlinger, R., Krasker, W., 1987. Who profits from nonprofits. Harvard Business Review January–February, 93–106.

Kingma, B.R., 1989. An accurate measurement if the crowd-out effect, income effect, and price effect for charitable contributions. Journal of Public Economics 97, 1197–1207.

Lakdawalla, D., Philipson, T., 1998. Nonprofit production, competition, and long-term care. University of Chicago, Mimeo.

Malani, A., T. Philipson and G. David, (2003), Theories of firm behavior in the nonprofit sector In: Glaeser, E. , ed., The Governance of Not-for-Profit Organizations, The University of Chicago Press, pp. 181-215.

McCormick, R. and R. Meiners, 1988, University governance: a property rights perspective. Journal of Law and Economics, 31 (3): 423-442.

Newhouse, J., 1970. Toward a theory of nonprofit institutions: an economic model of a hospital. American Economic Review, 60(1), 64-74.

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Okten, C. and B. Weisbrod, (2000), Determinants of Donations in Private Nonprofit Markets, Journal of Public Economics, 255-272.

Oster, S., (1998), Executive Compensation in the Nonprofit Sector, Nonprofit Management and Leadership, 8, 207-221.

Pauly, M. and M. Redisch, (1973), The Not-For-Profit Hospital as a Physicians' Cooperative, American Economic Review, 63, 87-99.

Pauly, M., (1987), Nonprofit firms in medical markets, American Economic Review, 77(2), 257-262.

Preston, A., (1988), The effects of property rights on labor costs of nonprofit firms: An application to the daycare industry, Journal of Industrial Economics, 36(3), 337-350.

Roomkin, M. and B. Weisbrod, (1999), Managerial Compensation and Incentives in For-Profit and Nonprofit Hospitals, Journal of Law, Economics and Organizations, 15, 750-781.

Rose-Ackerman, S., 1996. Altruism, non-profits, and economic theory. Journal of Economic Literature 34, 701–728.

Segal, L.,Weisbrod, B., 1998. Interdependence of commercial and donative revenues. In: Weisbrod, B. (Ed.), The Nonprofit Economy. Harvard University Press, Cambridge, MA, pp. 105–127.

Wedig, G., Hassan, M. and M. Morrisey, Tax-Exempt Debt and the Capital Structure of Nonprofit Organizations: An Application to Hospitals Journal of Finance**,** Volume 51: Issue 4, 1247-1283.

Weisbrod, B., 1988. The Nonprofit Economy. Harvard University Press, Cambridge, MA.

Weisbrod, B., 1998. To Profit or Not to Profit. The Commercial Transformation of the Nonprofit Sector. Cambridge University Press, Cambridge, UK.

Appendix 1: Derivations of Basic Model Results

In this appendix I provide formal derivations of selected results discussed in Section 3: a) the joint utility maximizing solution; b) the results under donor-controlled governance; and c) the results under insider-controlled governance.

A.*1.1 Joint Utility Maximizing Solution*

The joint utility maximizing problem is to maximize ϕ where

$$\begin{aligned}\phi &= pU^d(s,\theta^H)+(1-p)U^d(s,\theta^L)-(1-p)d \\ &+(p)(\alpha)(\theta^H)+p(\bar{w}+(s)(r^H)(\delta))+(1-p)\alpha(\theta^L)+(1-p)(\bar{w})\end{aligned} \quad \text{(A.1)}$$

The optimization is over the variables ($s, d, \bar{w}, \delta$). The first order conditions are:

$$\phi_s = (pU_s+(1-p)U_s)+\alpha(r^n-1)+(1-\alpha)(\delta)(r^n)+pU_{\theta^H}(r^H(1-\delta)-1)-(1-p)U_{\theta^L} = 0 \text{ A.2.a}$$

$$\phi_d = (1-p)(U_{\theta^L}+\alpha-1)=0 \quad \text{(A.2.b)}$$

$$\phi_\delta = p(sr^H)(1-\alpha-U_{\theta^H})=0 \quad \text{(A.2.c)}$$

and

$$\phi_{\bar{w}} = (1-\alpha)-pU_{\theta^H}-(1-p)U_{\theta^L}=0 \quad \text{(A.2.d)}$$

Condition (A.2.b) simplifies to $U_{\theta^L}+\alpha=1$. The condition (A.2.c) can likewise be written as $U_{\theta^H}+\alpha=1$. Conditional on $U_{\theta^i}=(1-\alpha)$, (i=L,H) it follows from equation (A.2.d) that $\phi_{\bar{w}}=0$, for all $\bar{w}$ so that marginal changes in fixed wages have no marginal effect on joint utility, at the optimum. Finally, substituting $U_{\theta^i}=(1-\alpha)$ into (A.2.a) and simplifying yields a simple expression for optimal capacity, s:

$$U_s+r^n=1 \quad \text{(A.3)}$$

where $r^n = pr^H$, the expected financial return on assets across both regimes.

Concavity of U(s, θ) in both s and θ guarantee that second order conditions hold at the optimum.

A.1.2 Joint Utility Maximizing Solution Where NDC Binds

The simplest way to solve the joint welfare problem where the NDC constraint binds is to fix insider wages in the high regime (at their limit) and to allow a choice over donations, capacity and wages in the low regime. The joint utility problem is to maximize:

$$\begin{aligned}\phi &= pU^d(s,\theta^H) + (1-p)U^d(s,\theta^L) - (1-p)d \\ &+ (p)(\alpha)(\theta^H) + p(w^H) + (1-p)\alpha(\theta^L) + (1-p)(w^L)\end{aligned} \quad \text{(A1.1)}$$

where it is understood that w^H is fixed. The optimization is over the variables (s, w^L ,d). The resulting first order conditions are:

$$\phi_d = (1-p)(U_{\theta^L} + \alpha - 1) = 0 \quad \text{(A.2.1.a)}$$

$$\phi_{w^L} = (1-p)(U_{\theta^L} + \alpha) = 1 \quad \text{(A.2.1b)}$$

And

$$U_s + r^n = 1 + (1-\alpha-\mu)(p^H)(r^H - 1) \quad \text{(A.2.1.c)}$$

Again, second order conditions hold due to the concavity of donor utility is s and θ.

A.1.3 Problem Solution Under Donor Governance – NDC Does Not Bind

The donor's objective is to:

$$\max \phi = pU(s,\theta^H) + (1-p)U(s,\theta^L) - (1-p)d \quad \text{(A.4)}$$

subject to,

$$\bar{w} + p\delta r^H + \alpha(p(\theta^H) + (1-p)E(\theta^L)) >= w^m \quad \text{(A.4.a)}$$[34]

$$\theta^H = s(r^H(1-\delta) - 1) - \bar{w} \quad \text{(A.4.b)}$$

$$\theta^L = d - s - \bar{w} \quad \text{(A.4.c)}$$

The optimization is over the triple (s, δ ,d), where the variables are selected in sequence, so that for example the optimal choice of s is made recognizing the subsequent dependence of (δ , d) on the chosen s and the choice of optimal δ is made recognizing the subsequent dependence of d on δ .

The problem can be solved with the following program:1) use (A.4.a) to solve for $\bar{w}$ in terms of the other variables; 2) insert the expression for $\bar{w}$ into (A.4.b) and (A.4.c) and solve for θ^H and θ^L in terms of (s, δ ,d); 3) solve for optimal d conditional on (s, δ); 4) solve for optimal δ conditional on s, noting the dependence of optimal d on the choice of δ ; 5) solve for optimal s, noting the dependence of both optimal δ and optimal d on s.

The combination of steps 1) and 2) give the following expressions for θ^H and θ^L in terms of (s, δ , d):

$$\theta^L = \frac{d(1-p\alpha) - s(1-pr(\alpha+\delta-\alpha\delta)) - w^m}{(1-\alpha)} \quad \text{(A.5)}$$

and

$$\theta^H = s(r(1-\delta)-1) + \frac{d(\alpha(1-p) - s(\alpha - pr(\alpha+\delta-\alpha\delta)) - w^m}{(1-\alpha)} \quad \text{(A.6)}$$

Next, (step 3), the condition for donations, d, can be written as:

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[34] The constraint incorporates expected surplus in the low state, E(θ^L) because at the time that the wage contract is offered, donations are yet to be received. Instead, I assume that insiders have rational expectations about future donations.

$$U_{\theta^L} = 1 \quad \text{(A.7)}$$

Define "f" as the value of economic surplus such that (A.7) holds, so that $\theta^L = f$ and

d = (f+s+ $\bar{w}$)[35]. This enables me to rewrite (A.5) and (A.6) as,

$$\theta^L = f \quad \text{(A.8)}$$

$$\theta^H = \frac{s(r(1-\delta)-1+pr\delta)+f\alpha(1-p)-w^m}{(1-p\alpha)} \quad \text{(A.9)}$$

while,

$$d = \frac{s(1-pr(\alpha+\delta-\alpha\delta))+f(1-\alpha)+w^m}{(1-p\alpha)} \quad \text{(A.10)}$$

Next, the optimal value of δ can be obtained by maximizing (A.4) subject to (A.8)-(A.10). This problem, as stated, now incorporates the constraint of (A.4.a) as well as the dependence of d on (s, δ).

The resulting first order condition is,

$$U_{\theta^H} = (1-\alpha) \quad \text{(A.11)}$$

Finally, choose s to maximize (A.4) subject to (A.8)-(A.10) and (A.11). Equations (A.8) and (A.11) imply that θ^H and θ^L are fixed and independent of s. Thus, the first order condition for s becomes:

$$U_s = (1-p)d_s \quad \text{(A.12)}$$

Furthermore, the fixity of θ^H and θ^L imply that:

$$\delta_s = \frac{r(1-\delta(1-p))-1}{sr(1-p)} \quad \text{(A.13)}$$

This result enables me to differentiate (A.10) with respect to s, giving the result:

[35] Note that, given the assumed form of donor utility, donors will always commit to an economic surplus of f, provided that net utility in the low regime is non-negative.

$$d_s = \frac{(1-pr^H)}{(1-p)} \quad \text{(A.14)}$$

Finally, substituting (A.14) into (A.12) shows that the optimal choice of s obeys:

$$U_s = (1-r^n) \quad \text{(A.15)}$$

Thus, equations (A.7), (A.11) and (A.15) specify the choices of (d, δ,s) under donor governance provided that $U(s,\theta^L) >= (s+f+\bar{w})$ (donors earn non-negative net utility from donating in the low regime) .

Otherwise, s is implicitly defined by the condition $U(s,\theta^L) = (s+f+\bar{w})$. This is so because increases in s beyond this point lead an expectation of bankruptcy in the low state and thus lead to increases in the cost of debt service sufficiently high so as to make marginal increases in s unprofitable even in the high state[36]. It is easily seen that d and δ are still defined by (A.7) and (A.11).

A.1.4 Problem Solution Under Donor Governance – NDC Binds

The problem simplifies somewhat compared to the unconstrained problem. In the constrained case, I assume that donors operate in the regime where $\bar{w} = 0$[37]. Thus the problem is:

$$\max \varphi = pU(s,\theta^H) + (1-p)U(s,\theta^L) - (1-p)d \quad \text{(A.16)}$$

Subject to,

$$w^H + \alpha(pE(\theta^H) + (1-p)E(\theta^L)) >= w^m \text{ (A.17.a)}$$

---

[36] Here is suffices to show that in the case of expected insolvency in the low state, r^b, the cost of debt, will exceed r^H the marginal return to capacity in the high state. Note that $r^b = \frac{1}{p} > r^H$ because $1 > pr^H = r^n$.

[37] Intuitively, surplus in the high state is high to its marginal utility to donors, so that the optimal compensation policy is to concentrate compensation in this regime and set fixed wages equal to zero.

$$\theta^H = s(r^H - 1) - w^H \quad \text{(A.17.b)}$$

$$\theta^L = d - s \quad \text{(A.17.c)}$$

Here, w^H stands for the level of cash compensation to insiders in the high regime (it proves simpler to work with w^H than δ in this case).

Now, the problem can be solved with the following program: 1) use (A.17.a) to solve for w^H in terms of the other variables; 2) insert the expression for w^H into (A.17.b) and solve for θ^H in terms of (s,d); 3) solve for optimal d conditional on s; 4) solve for optimal s, noting the dependence of optimal d on s.

The combination of steps 1) and 2) give the following expressions for θ^H and θ^L in terms of (s, d):

$$\theta^L = d - s \quad \text{(A.18)}$$

And

$$\theta^H = \frac{s(r-1) + d(\alpha(1-p)) - s(\alpha(1-p)) - w^m}{(1-\alpha)} \quad \text{(A.19)}$$

Next, (step 3), the condition for donations, d, can be written as:

$$U_{\theta^L} = 1 \quad \text{(A.20)}$$

Define "f" as the value of economic surplus such that (A.20) holds, so that $\theta^L = f$, and d = (f+s). This enables me to rewrite (A.18) and (A.19) as

$$\theta^L = f \quad \text{(A.21)}$$

And

$$\theta^H = \frac{s(r-1) + f(\alpha(1-p)) - w^m}{(1-\alpha)} \quad \text{(A.22)}$$

Finally, the first order condition for s can be written:

$$\phi_s = U_s + U_\theta^H p(\frac{(r-1)}{(1-\alpha)}) - (1-p) = 0. \text{ (A.23)}$$

Rearranging (A.23), gives

$$U_s = (1-r^n) + (1 - \frac{\mu}{(1-\alpha)})(p)(r-1) \text{ (A.24)}$$

A.1.5 Problem Solution Under Insider Governance

Where insiders control governance, insiders select s and δ while donors still select donations at the end of the period. Total compensation is set equal to the regulatory constraint.

A formal statement of the insider problem is:

Max $\phi = \bar{w}(1-\alpha) + p(\alpha)(s)(r-1) + p(1-\alpha)(s)(\delta)(r) + (1-p)\alpha(d-s)$ (A.25)

Subject to:

$$w^r = \bar{w} + (p)(s)(\delta)(r) \text{ (A.26.a)}$$

$$U_\theta^L(d) = 1 \text{ if } U(s,\theta^L) >= \theta^L + s + \bar{w},\ d = 0, \text{ otherwise, (A.26.b)}$$

Note that (A.26.b) describes donor conduct; donations are provided in the low state up to their optimal margin, but only if net donor utility is non-negative in the low state.

Before solving the problem, it will be useful to state a property of the problem's solution:

Lemma: At the optimal choice of (s, δ) it is the case that $U(s,\theta^L) = \theta^L + s + \bar{w}$.

Proof: Assume not. Then it would be possible for insiders to increase s without decreasing economic surplus in the low state. Since any increase in s increases surplus in the high state, this would increase the utility of insiders. QED.

The lemma allows me to restate the problem the same as above except that in equation (A.26.b) the weak inequality is replaced with an equality.

The solution program for the problem becomes: 1) use (A.26.a) to solve for $\bar{w}$ and substitute the result into the original problem; 2) solve for optimal donations as a function of (s, δ); 3) solve for the required value of δ that satisfies the zero net utility constraint, as function of s; 4) select optimal s, recognizing its effect on required δ.

Define "f" as the value of realized economic surplus such that $U_{\theta^L} = 1$. Thus, if donors choose to donate, $\theta^L = f$.

The results of steps 1) and 2) allow me to restate the problem as maximizing:

$$\phi = w^r(1-\alpha) + p(\alpha)(s)(r-1) + (1-p)\alpha(w^r + f) - (1-p)\alpha p(s)(\delta)(r) \text{ (A.27)}$$

$$\text{Subject to } U(s, \theta^L) = \theta^L + s + \bar{w} \text{ (A.28)}$$

The optimization is now over (s, δ). Given that s is selected before δ, the parameter δ is used to satisfy the zero net utility constraint, conditional on the chosen value of s. The value of δ that is required to satisfy the zero utility condition is:

$$\delta = 0 \text{ if } (f + s + w^r) <= U(s, f) \text{ (A.29.a)}$$

$$\delta = \frac{(f + s + w^r - U(s, f)}{(p)(r)(s)} \text{ (A.29.b) otherwise.}$$

With the equation for δ in hand, the problem reduces a choice of s alone, subject to the expression for δ, above which now depends on s. The derivative of donor utility with respect to s is:

$$\phi_s = \alpha[(p)(r-1) - (1-p)(p)(r)(s)\delta_s] \text{ (A.30)}$$

This derivative is strictly positive for values of s such that $(f + s + w^r) < U(s, f)$ because $\delta_s = 0$ over this range. The derivative is also discontinuous at the point where $(f + s + w^r) = U(s, f)$ because δ_s is discontinuous at this point. This leads me to conclude that the insider choice of s is implicitly defined by the condition $(f + s + w^r) = U(s, f)$ if (A.30) is negative at the point where the zero net utility condition holds. Otherwise the insider choice of s is defined by the first order condition,

$$\alpha[(p)(r-1) - (1 - p(p)(r)(s)\delta_s] = 0 \quad \text{(A.31)}$$

where it is easily shown that

$$\delta_s = \frac{-(U_s s + f + w^r - U(s, f))}{r^n s^2} \quad \text{(A.32)}$$

These results allow me to characterize the insider's choice of s relative to the joint optimizing solution. I note that, at the point where $(f + s + w^r) = U(s, f)$

$$\phi_s = [(1-p)U_s - (1-r^n)] >< 0 \quad \text{(A.33)}$$

From inspection of (A.33) in comparison to (A.3), it is apparent that (A.33) may be negative for values of s that are greater, less than or equal to the value of s that satisfies (A.3), the joint optimizing value.

From this result, properties of the solution follow:

a) if capacity *exceeds the joint optimum level of capacity* at the point where $(f + s + w^r) = U(s, f)$, then insiders will choose δ =0 and capacity will be defined by the condition $(f + s + w^r) = U(s, f)$ and will exceed the joint optimal level of capacity'

b) if capacity is *less than the joint optimum* but greater than the level defined by the equation $U_s = \frac{(1-r^n)}{(1-p)}$ at the point where $(f + s + w^r) = U(s, f)$, then insiders will also choose δ =0 and capacity will again be defined by this (zero utility) condition, but now capacity will be below the joint optimal level;

Finally,

c) if capacity is *less than the social optimum* and also less than the level defined by the equation $U_s = \frac{(1-r^n)}{(1-p)}$ at the point where $(f + s + w^r) = U(s, f)$ then insiders will choose positive δ and capacity will be defined by the condition $U_s = \frac{p(r-1)}{(1-p)(k-1)} + \frac{(f+w)}{s(k-1)}$ where k measures the concavity of the utility function.