WP/01/70

IMF Working Paper

What is Different About Family Businesses?

Ralph Chami

INTERNATIONAL MONETARY FUND

 WP/01/70

IMF Working Paper

IMF Institute

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Prepared by Ralph Chami[1]

Authorized for distribution by Samir El-Khouri

May 2001

Abstract

Family businesses make up forty percent of the Fortune 500 companies in the US, generate about two-thirds of the German GDP, employ about one-half of the labor force in Britain, and account for the majority of the private economies in developing countries. This paper develops a theory of family business that brings market forces and the family, as a nonmarket institution, under one rubric. The paper highlights and analyzes important factors, including product market competition, trust, and succession, which allow family businesses to thrive and to successfully compete with other businesses.

JEL Classification Numbers: D1, D64, D82, J3

Keywords: altruism, asymmetric information, family business, trust, nonmarket transactions, moral hazard, corporate governance

Author's E-Mail Address: rchami@imf.org

[1] I am indebted to Gary S. Becker, Steve Davis, Samir El-Khouri, Jeffrey Fischer, Connel Fullenkamp, Mohsin Khan, Edward P. Lazear, Sunil Sharma, and Michael Waldman for many helpful comments and discussions. I would also like to thank session participants at the 1999 AEA meetings, and seminar participants at the SEC and at the Midwest Mathematical Economics Meetings, for comments on an earlier version of the paper.

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I. Introduction

Family businesses have played a key role in the modernization of the economies of the developed and developing nations. The family's ability to provide the critical capital and entrepreneurial spirit is deemed crucial to the development of capitalism and in spurring the industrialization of the developed countries (see, for example, Howell (1986) and Shaffer (1982)).

Recently, Gersick, Davis, Hampton and Lansberg (1997) in their book "Generation to Generation," report that family firms (family owned or controlled) account for 65-80% of all worldwide businesses, and for about 40% of the Fortune 500 companies. Shanker and Astrachan (1996) present conservative estimates that indicate that US family businesses account for 12% of GDP, employ 15% of the workforce and contribute 19% of all new jobs.[2] Moreover, in Europe, Asia, and Latin America family firms continue to represent the majority of firms ranging from small to large industrial entities.[3] For example, family businesses generate 66% of the German GDP and employ 75% of the workforce, while they employ 50% of the workforce in Britain.[4] In many developing countries, family firms represent the private economy, provide much-needed capital and take on the risks essential to spur new industries that contribute to their economic development. In India, family businesses account for 70% of total sales and net profits of the biggest 250 private sector companies (see The Economist, October 5, 1996).

But very little is known about how these businesses differ from those owned by diverse shareholders, for it is only in the last decade that serious academic research on family businesses has been undertaken. Moreover, microeconomic theory underlying research in disciplines such as finance, accounting, and management has not differentiated between the dynamics of operating a family business and operating other businesses. The qualitative literature that exists, drawing on work in sociology and psychology, has shed some light on the complexity of running a family business. Davis (1983), Levinson (1983), Lansberg (1983), and

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[2] Using a more broad criteria of what constitutes a family business, Berckhard and Dyer (1983) estimate that family-owned businesses account for more than 80% of the businesses in the US alone, generate 50% of the US GDP and employ about half the work force. See also Lansberg (1983), Davis (1983), and Barnes and Hershon (1976). The more conservative criteria used by Shanker and Astrachan (1996) defines a family business as one where multiple generations of the same family maintain control of the business, and are directly involved in running and managing the business.

[3] It is estimated that in 1997 the top 10 families in Indonesia controlled corporations worth more than one-half of the country's market capitalization, with similar numbers for Korea, Thailand, and Malaysia.

[4] For an analysis of the concentration of family businesses in Sweden, see Rydqvist (1996), in Britain see Megginson (1990), and Kunz and Angel (1996) for family businesses in Switzerland. See also Allen and Gale (2000), Chapter 4.

Berckhard and Dyer (1983), among others, have pointed out that although the family business shares values and characteristics with both the family and the business entities, it confronts unique challenges. The parent-founder faces numerous challenges, including balancing equity with efficiency, succession with merit, and paternalism with agency. These studies concur that the business is never free from family influences and vice-versa. Gersick et. al. (1997), realizing the complexity of relationships within a family business, identify three spheres of influence that together affect a family business: family, business and ownership. These, in turn, are affected by factors such as tradition, culture, inheritance laws, and religion. As head of the family, the parent is altruistic toward his family members, but as manager and founder, the parent is faced with having to follow sound business practices if the business is to succeed and thrive in a competitive market. Davis (1983), among others, points out that what distinguishes successful family firms from other nonfamily business enterprises is the level of trust and altruism, commitment, long-range planning, and love for the firm. In fact, paternalism is often extended to nonfamily members of the firm, which helps engender a sense of stability and dedication to the business among all employees.[5] In several of these papers and others, the authors suspect that some of the aforementioned results are obtained because of the mitigating influence of familial relation on the agency problem that would otherwise occur in the business environment. This sentiment was alluded to earlier by DeAngelo and DeAngelo (1985) and Fama and Jensen (1983) who opined that family members may have "... advantages in monitoring and disciplining related decision agents." However, the qualitative literature for the most part relies on anecdotal observations and is not based on rational choice models. Consequently, the existing work shows little ability to analyze decision making by utility maximizing agents involved in running a family business.

Recently, the empirical corporate finance literature has begun to shed some light on the unique dynamics of the family firm. On the type and level of financing available to privately-owned family businesses, Bopaiah (1998) finds that family ownership is correlated with greater availability of credit, in contrast to founder-managed firms. With respect to compensation management in publicly-traded firms, Kole (1997) finds that family firms are less likely to rely on performance-based compensations for executives who may be related to the founding family. Bates, Jandik and Lehn (1998) find that in founder-run public companies there is greater reliance on bonuses than on stock options to reward nonfamily top managers. On the positive impact of family control on firm performance, Morck, Shleifer and Vishny (1988) find a positive effect of family control on Tobin's Q, and McConaughy, Walker, Henderson and Mishra (1998) present evidence that founder family controlled firms are more efficient and more valuable than non-family firms.

This paper provides a theory of family business based on the well established microeconomic theory of the family and altruism, as well as the agency literature. The theoretical framework allows for exploring the interaction between the family and the firm. The model assumes a

[5] See, for example, Kirby (1984) for an interesting study of the dynamics of the Quaker Business Society.

privately held family business operating in a competitive market characterized by risk and uncertainty, an altruistic parent who is also founder and manager of the firm,[6] and his child who is working for the family firm. Throughout the paper I will often refer to the altruistic parent-founder-manager as an "altruistic principal," and to the child as an "agent." The child has private information regarding his effort level, while the parent has to rely on the firm's output as a signal of the child's effort level. This gives rise to a moral hazard problem between an altruistic parent and his child. I show that the family business deals with the moral hazard problem in a way that is fundamentally different from the way nonfamily businesses and other families react to the moral hazard problem. I do this by comparing the behavior of members of a family business to the behavior of the managers and employees of nonfamily business, and the behavior of nonfamily employees of the family business.

The paper identifies three distinguishing features of the family business. First, the level of trust among family members is an important factor that gives rise to a family business, and provides it with a competitive edge vis-à-vis other nonfamily businesses. I show how trust mitigates the moral hazard problem between the parent/principal and the child/agent, raises the child's effort level and expected output, and leads to higher expected profits. In fact, trust obviates the need to rely on costly state-contingent wages as a mechanism to induce high effort from the child. Trust induces the child to internalize the cost of his actions on the parent's welfare, thus refraining from actions that may hurt the parent/owner. Conversely, a trusting parent avoids relying on monitoring or using performance based wages to induce high effort from the child. Yet the parent enjoys a high effort level from the altruistic child, when compared to the effort level of a nonaltruistic child or a nonfamily employee. Thus, trust is efficiency enhancing, and is a critical characteristic that distinguishes successful family businesses from unsuccessful family businesses or other nonfamily businesses.[7] On the other hand, when trust is low or altruism is one-sided, the agency problem is exacerbated.[8] In the family firm agency problems arise not only due to asymmetry of information, but also due to asymmetry in altruism. Thus, absent any other mitigating factors such as trust, the agency problem may interfere with the survival of the family business.

Another important factor is market competition. Hart (1983) was the first to identify market competition as a possible solution to the agency problem that may arise in a firm. In this case, the presence of market risk and asymmetric information regarding the child's effort induces an

[6] The term "manager" here refers to the founder's role in deciding on the employee's wages.

[7] This result is also consistent with the empirical observations of successful family businesses, where the founder's child, although having an inside track into the family firm, works his way up and performs at least as well as other managers (see, for example, Davis (1983) and Lansberg (1983)).

[8] See Bernheim and Stark (1988) for a discussion of moral hazard due to asymmetric altruism, but in the presence of perfect and complete information.

altruistic parent to shift income risk to the child. By relying more on performance based wages, the parent—who is also concerned about the impact of the child's effort on firm profits—attempts to reduce the moral hazard problem. The altruistic parent recognizes the disincentive effect of nonperformance based wages on the child's effort level, which leads to lower firm profits. A drop in the firm's expected profits lowers the family income, which implies lower pay for parent and child. As a result, the altruistic parent/owner is likely to shift more risk to the child than he would in the absence of the market discipline. Thus, higher altruism, in this case, does not necessarily lead to higher insurance against market risk. This result stands in contrast to other altruistic models of the family, where higher altruism is associated with higher insurance or compensatory type transfers (See, for example, Becker (1991), Cox (1987, 1992), among others).

I show that the altruistic parent's willingness to sacrifice efficiency for equity is affected by the structure of the product market. An altruistic parent/founder, however, cannot accept lower profits forever. Either the parent must fire the child, or the family business will have to sell out and exit the market. Thus, the dysfunctional role of one-sided altruism may be an important reason behind the demise of family businesses, which we often read about in the popular press.

Along with trust and competition in the product market, succession plays a key role in affecting the survival of a family business. The typical mode of succession in family firms is from the parent-founder to a single child (most often, the eldest son and, more recently, the daughter). Gersick et. al. (1997) report that the single-founder type accounts for 75% of all family firms in the US and most western economies, with the multiple-siblings type accounting for 20%, and only 5% for the extended-family type.[9] The case where the parent favors one heir is defended on efficiency grounds; the leader is able to make tough decisions and act swiftly, unhindered by the interference of other family members, some of them not even employed by the firm. In this paper, I will ignore the case of multiple children; while it is interesting, it adds little of practical value to the discussion given the statistics supporting single-founder-type. Interestingly, knowing that he will be succeeding his parent and inheriting the business provides the child with the incentive to work hard, rather than take advantage of the parent's generosity. Being the future residual claimant of the firm's rents causes the child to internalize much of the moral hazard. As a result, the optimal compensation package allows the parent to provide the child less risk sharing. This result supports the empirical observations reported in Kole (1997), in the context of publicly owned family businesses, and others alluded to earlier in the corporate finance literature. Moreover, it provides further evidence that firm ownership by stakeholders induces a greater realignment of incentives between founders and employees, thereby increasing firm performance. Interestingly, and in the context of business partnerships, Kandel and Lazear (1992) argue that mutual monitoring, guilt, and empathy among partners help reduce shirking. They note, however, that for profit sharing to induce higher effort in larger organizations, the

[9] In a recent article, Dunn and Phillips (1997) provide empirical evidence that wills (which may include the family business) provide equally for all children, irrespective of their respective incomes. See also Menchik (1988).

worker should care about his peer group, or that the peer group should be small enough in size to affect accurate monitoring.

The role of trust and succession in this paper accords with the recent and interesting work by Rotemberg (1994) and Mulligan (1997), which aims at endogenizing altruism and firm loyalty. Rotemberg (1994) finds that the presence of strategic complementarity between the actions taken by the agent and the principal, but with the absence of asymmetric information, induces altruism on the part of the principal. Mulligan (1997) endogenizes firm loyalty, and shows that, in this case, the principal can reduce his reliance on performance pay and increase the insurance aspect of the compensation schedule, but still enjoy high productivity and loyalty from the agent. I will show that both trust and ownership allow the founder to enjoy the highest levels of productivity from the employees without having to rely on incentive type wages. This also seems to accord with more recent empirical observation of La Porta, Lopez-de-Silanes, Shleifer and Vishny (1996) on the beneficial effect of trust on employee productivity.

Section 2 sets up the asymmetric altruism benchmark case with an altruistic parent and a selfish child who does not expect to inherit the business. Given that the altruistic parent is concerned with the survival and success of the family business, I derive the optimal effort and wage contract. I explore the interaction between the family and the business, and analyze the impact of the business on the altruistic relationship between the parent and the child. In Section 3, both the parent and the child are altruistic, and I focus on the role of trust and symmetric altruism in the family business. Section 4 develops a two-period model that highlights the role of succession and inheriting the business on the family and the firm, and Section 5 discusses the results and concludes.

II. Model: Asymmetric Altruism

In this section, I consider the case where the child does not necessarily expect to succeed the parent in running the business, and does not share the parent's level of altruism (asymmetric altruism). In this case, the child resembles a nonfamily employee (agent) working for an altruistic principal. This allows us to focus on the role of the business in affecting family dynamics while the role of trust and symmetric altruism are analyzed in Section 3, and the role of succession is treated in Section 4.

The parent owns and manages a family firm that is operating in a competitive market.[10] The parent as founder and residual claimant extracts a rental rate r that reflects his opportunity cost of ownership. The family firm's output net of the rental rate paid to the parent is x. Assuming a two-state world, output can be high (x_H) or low (x_L). The probability that the low-output state occurs is $P(e)$, where e is the child's effort and is unobservable to the parent; assume $P' < 0$ and $P'' > 0$. The risk-averse parent is altruistic toward his child, but as founder and manager of the family firm, the parent recognizes that the business needs to survive in a competitive market. In

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[10] See Sections II C and II D for a discussion of the assumption of competition in the product market.

choosing the wage structure to maximize his expected utility, the parent also ensures that the family firm maximizes profits.[11] Due to the moral hazard problem, the child receives state-contingent wages w_L in state L and w_H in state H. Moreover, the child's risk aversion implies that $x_L - w_L < 0$, whereas $x_H - w_H > 0$. The parent as founder receives r and as manager receives the residual x-w, such that his expected utility is

$$EU_p(c_p,U_k) = E\lfloor u(c_p) + \beta_p U_k \rfloor,$$

where $c_p = y_p = r + x - w$ is the parent's net consumption, y_p is his income, and $0 \leq \beta_i \leq 1$ is the intercohort discount factor (or altruism parameter), where the subscripts $i = k, p$ refer to the child and parent, respectively. As mentioned earlier, I will first consider the asymmetric altruism case, that is, $\beta = \beta_p > \beta_k = 0$. It is clear that when low output is realized (with probability P) then the parent's income is $y_{pL} = r + x_L - w_L$, whereas his high income is $y_{pH} = r + x_H - w_H$, which occurs with probability 1-P. Assuming that $y_{pH} > w_H$, and $y_{pL} > w_L$, then $u_p(y_{pH}) > u_k(w_H)$, and $u_p(y_{pL}) > u_k(w_L)$. Thus, the diminishing marginal utility assumption implies the following ranking; $u'_p(y_{pH}) < u'_k(w_H)$, and $u'_p(y_{pL}) < u'_k(w_L)$, which is helpful to keep in mind as it will be used often. Note that although the child's effort enters the parent's utility function indirectly through the child's utility, the parent may not see eye to eye with the child regarding the effort level that ought to be expended, because the parent discounts the child's disutility from effort by β.

The family firm's expected profit is

$$E\pi(w_L, w_H; e) = P(e)x_L + (1 - P(e))x_H - [P(e)w_L + (1 - P(e))w_H].$$

The expected utility to the child is

$$EU_k(c_k, e) = P(e)u_k(w_L) + (1 - P(e))u_k(w_H) - v(e). \tag{1}$$

Let c_k denote the child's consumption and define $u_{kL} \equiv u_k(w_L)$ *and* $u_{kH} \equiv u_k(w_H)$. Assume $u_i = u_k = u_p$ is symmetric across agents, strictly increasing, concave, and twice continuously differentiable. The disutility of effort v is an increasing, strictly differentiable convex function.

The parent first declares a wage contract (w_L, w_H); the child then decides on a level of effort; nature plays; and the firm's output is realized. Using backward induction I first examine the child's choice of effort, then I derive the optimal wage contract.

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[11] On the congruence of founder utility with profit maximization, see, for example, McGivern (1978), Monsen, Chiu and Cooley (1968), Ng (1974), Radice (1971), and Holl (1975).

A. Effort

The optimal level of effort is given by the first-order condition

$$(u_{KL} - u_{kH})P' - v' = 0, \tag{2}$$

which yields $e^* = e(w_L, w_H)$. From (2) it is clear that $w_L \neq w_H$ if the child is to expend effort, $e^* > 0$. Therefore, it must be that $u_{kH} > u_{kL}$, which implies that $w_H > w_L$. In other words, the parent cannot offer the child wage insurance, through fixed wages, if the child is to expend any effort. The next result shows that higher income insurance by the parent, in the form of higher w_L, can only lead to lower effort. On the other hand, higher incentive type wages, in the form of higher w_H, engender higher effort.

Lemma 1

$$e^*_{wL} \equiv \frac{de^*}{dw_L} = -\frac{P' u'_{kL}}{P''(u_{kL} - u_{kH}) - v''} < 0, e^*_{wH} \equiv \frac{de^*}{dw_H} = -\frac{-P' u'_{kL}}{P''(u_{kL} - u_{kH}) - v''} > 0.$$

B. Optimal Wages

Equilibrium for firms in the competitive market, which includes the family firm, implies expected profits are zero, i.e., in (1) $E\pi^* = 0$. The equilibrium zero expected profit condition yields the following condition:

$$w^*_H = x_H + \left[\frac{P}{1-P}\right][x_L - w_L], \tag{3}$$

where $w^*_H = w_H(w_L, e)$. Condition (3) implies an inverse relationship between the state-contingent wages, i.e., $\frac{\partial w^*_H}{\partial w_L} < 0$. Thus, if the parent were to lower w_L, then by (3) w_H would have to be raised, which implies a higher wage dispersion and more risk being shifted to the child. On the other hand, a higher w_L implies a lower w_H, which leads to higher insurance for the child.

The parent chooses the optimal wages (w_L, w_H), taking into consideration the optimal effort level chosen by his child (2),[12] and that the family business has to compete in a competitive market (3), where, in equilibrium, expected profits are zero.

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[12] Note that due to the presence of altruism and information asymmetry, the child's participation constraint is not binding, and as a result it is not included (see Proposition 2). See Chami (1998) for a discussion of this issue in the context of private information and altruism, and Cox (1987) in the context of altruism but with perfect and complete information.

$$\max_{w_L, w_H} EU_p = P[u_{pL} + \beta u_{kL}] + (1-P)[u_{pH} + \beta u_{kH}] - \beta v(e^*),$$

subject to

$w_H = x_H + \left[\dfrac{P}{1-P}\right][x_L - w_L]$, according to (3)

e argmax EU_k, according to (2)

where $u_{pL} \equiv u_p\ (r + x_L - w_L)$ and $u_{pH} \equiv u_p\ (r + x_H - w_H)$.

The pair of constraints (3) and (2) implicitly define w_H and e as functions of w_L. Denote these as $w_H^{**}(w_L)$ and $e^{**}(w_L)$ to distinguish them from w_H^* and e^* derived earlier. These conditions are then solved simultaneously to calculate the total derivatives $\dfrac{dw_H^{**}}{dw_L} < 0$ and $\dfrac{de^{**}}{dw_L} < 0$.[13] This reduces the problem for the parent to choosing only w_L^*.[14] Assuming an interior solution, the first-order condition for the parent becomes

$$\frac{\partial EU_P}{\partial w_L} = P\left[-u'_{pL} + \beta u'_{kL}\right] + [u_{pL} - u_{pH}]P'\frac{de^{**}}{d_{wL}} + (1-P(e))\left[-u'_{pH} + \beta u'_{kH}\right]\frac{dw_H^{**}}{dw_L} = 0, \tag{4}$$

which yields $w_L^* = w_L(x_L, x_H, r; \beta)$.

The first term in (4) is the standard marginal utility tradeoff for the altruist from transferring an extra dollar to the child. The second term reflects the cost to the parent (in utility terms) of the moral hazard, due to the low effort chosen by the child $\dfrac{de^{**}}{dw_L} < 0$. However, the third term captures the interaction between the family business and the family. It reveals the risk-sharing between the parent and the child that arises explicitly from the daily operation of the business; it is the cost (in utility terms) for both parent and child of higher insurance type wages, w_L^*, due to the inverse relationship between w_L and w_H. Also, note that for low levels of β, the parent-child relationship is transformed to a standard principal-agent relationship.[15] This issue will be elaborated on more fully in later sections.

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[13] The mathematical derivation is relegated to the Appendix.

[14] See also Lazear and Rosen (1981).

[15] See Holmstrom and Milgrom (1994) for a more recent treatment of the principal-agent relationship.

C. The Role of Market Competition

Christiansen (1953) points out the danger in the family dominating the business, for its values and demands may be at odds with the interests of the business enterprise. The parent, as founder and manager, faces the formidable task of maintaining fairness. Lansberg (1983) points out that the difficulty arises because the norms and principles that govern exchange within the family differ from those in the firm. An agent's compensation within a firm is based on the value of his marginal product within a certain time frame, as in the adage "a fair day's work for a fair day's pay." On the other hand, exchange within the family is based on who the person "is" rather than what he "does." Family members are, "by definition, seen as ends in themselves," (Lansberg (1983, p.43)).

Contrary to popular belief, empirical studies have reported that a founder, in many cases, tends to underreward the child who is employed in the business. While it may be expected that the parent ensures that the child secures a job in the family firm, the child is nonetheless expected to work his way up and perform at least as well as the other employees.[16] Some of the reasons given include the belief that this helps build character, that too much money results in bad behavior, that the child will eventually inherit the business, and that nepotism has a detrimental effect on the financial viability of the family business.[17] Examples from the popular press include the Vanderbilts, Andrew Carnegie, and, more recently, Warren Buffet.[18] On the other hand, the literature on bequests and inter-vivos transfers has well documented the fact that altruistic parents provide such transfers to insure the recipient, with transfers increasing in the level of altruism (see for example, Becker (1991), and Dunn and Philips (1997)). Thus, what explains the toughness that seems to be exhibited by undoubtedly loving parents toward their children? The answer lies in the fact that families who run businesses face distinct concerns from families who do not. In the context of this model, the parent realizes, and internalizes, the fact that low output is partly generated by low effort on the part of the child. In other words, the source of risk is not entirely exogenous. Moreover, the parent also knows that his altruism induces higher wage insurance, which can only result in lower effort on the part of the selfish child. This leads to lower firm profits and lower family income.

I will show that if the child's compensation is not decided on the basis of merit and value added, the survival of the family firm is undermined. In fact, I will show that the survival of the family business in a competitive product market induces the parent to provide performance based pay, and shift income risk to the child. I will contrast this case with the case where the product

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[16] See, for example, Landsberg (1983).

[17] Lansberg (1983) defines nepotism, in this case, as referring to the case where the child's compensation is not validated by the value of his marginal product.

[18] Each of these rich individuals recognized the disincentive effect of his respective sizeable wealth on the effort decision of their beneficiaries. See, Holtz-Eakin, Joulfaian, and Rosen (1993), Clark (1966), *Time* (1995).

market competition is less than perfect, and hence some economic profits may persist in equilibrium. The latter case is one in which the family business possesses some degree of market power, so profits are not necessarily driven to zero in equilibrium. The case with market power implies that the parent maximizes his expected utility subject only to (2). Define w_L^N as the optimal wage for the first order condition that obtains in this case, where the superscript N refers to the case where perfect competition in the product market is absent. Also, let w_L^B be the optimal wage that solves the first order condition for the parent in (4), where the superscript B refers to the parent acting as an altruistic principal.

Proposition 1 *Market competition induces the altruistic parent/principal to lower the insurance aspect of the wage contract for the child, i.e., $w_L^B < w_L^N$, thereby shifting more income risk to the child.*

Proof: For the case where the parent maximizes his utility subject to (2) only, the first order condition for the parent is

$$\frac{\partial EU_p}{\partial w_L} = P\left[-u'_{pL} + \beta u'_{kL}\right] + [u_{pL} - u_{pH}]P' e^*_{wL} = 0. \tag{5}$$

Consider the following function $F(\theta, w_L)$ such that

$$F(\theta, w_L) \equiv P\left[-u'_{pL} + \beta u'_{kL}\right] + [u_{pL} - u_{pH}]P' \frac{de^{**}}{dw_L} + \theta\left[(1-P)[-u'_{pH} + \beta u'_{kH}]\frac{dw_H^{**}}{dw_L}\right] = 0,$$

where $\theta \in \{0,1\}$, such that if $\theta = 0$, the above f.o.c. corresponds to (5), and if $\theta = 1$, the f.o.c. corresponds to (4). Then, by the implicit function theorem,

$$F_\theta = \left[(1-P)[-u'_{pH} + \beta u'_{kH}]\frac{dw_H^{**}}{dw_L}\right] < 0 \Rightarrow \frac{dw_L^*}{d\theta} < 0 \Rightarrow w_L^B < w_L^N.$$

Moreover, from (3), a reduction in w_L^* implies a higher w_H^* and a higher wage dispersion. The parent, concerned with the success of the family business, realizes that higher wage insurance, in the form of higher w_L^*, leads to lower effort ($e^*_{wL} < 0$), which raises the probability of low output for the firm, and lower profits (recall condition (3)) for the family business.[19] The above result reveals that the business concern imposes market discipline on the relationship between the family members. As Hart (1983) pointed out, market competition induces a more efficient

[19] Note that even if the parent/founder possessed monopoly power, the parent would have the same incentives to limit the divergence of interests between him and the child/employee. See also the discussion in Jensen and Meckling (1976, p. 329).

corporate governance. Here, competition induces the altruistic parent to internalize the cost associated with his altruism. In order to avoid Bergstrom's (1989) "lazy rotten kid" syndrome, the parent running a family business can no longer afford to continue to compensate the child without regard to the impact of the child's effort on the firm's output, for his altruism impacts his welfare directly through the resulting actions taken by the child.

It is also important to note here that as the assumption of a competitive market is relaxed, the degree of inefficiency that the family business can tolerate increases. Under the perfect competition assumption, there is very little room for inefficiency (relative to other business entities); otherwise, exit would occur. On the other hand, if the family business were to enjoy monopoly power, inefficiency can exist up to the level of the monopoly rent before exit.[20]

Moreover, the next section reveals the dysfunctional role of one-sided altruism in reducing the competitiveness of the family business vis-à-vis nonfamily businesses, and eventually leading to its demise.

D. Altruism and Efficiency: *Three Generations Poor* (Chinese Proverb)

The next result shows that wage compensation in a family business differs from that in nonfamily run business. In fact, the altruistic parent provides higher wage insurance than would exist in a nonfamily business or in a pure agency setting (see also Theorem 1). Denote by w_L^T the optimal wage for the case of pure agency.

Proposition 2 *In contrast to a nonfamily business, altruism induces the parent/principal to increase the insurance aspect of the wage contract for the child, i.e.,* $w_L^B > w_L^T$.

Proof: Refer to the Appendix.

The above result suggests that the altruistic parent is willing to sacrifice efficiency for equity. By increasing the compensatory type wages w_L^* relative to a nonaltruistic principal, the parent provides higher wage insurance and is content with lower effort and lower output.

The results derived in this section are illustrated in Figures 1-3. Figure 1 depicts the benchmark case of a standard principal agent relationship in the absence of altruism, but in the presence of moral hazard. Assuming for the moment a risk neutral principal allows us to focus on the role of asymmetric altruism in affecting firm profits and the child's welfare. In this case the indifference curve for a risk averse child, U_k, is tangent to the firm's zero expected profit line, ZPL_1, at point A. Point A will not involve full insurance for the agent (along the certainty line); instead, it involves some risk sharing due to the moral hazard problem . The expected zero

[20] The assumption of competitive markets seems also to be appropriate, given that family businesses tend to be smaller and more labor-intensive.

profit line (condition (3)), ZPL_1, has a slope of $\left|\frac{dw_H}{dw_L} = \frac{-P+[\chi_L - w_L]P'e_L^*}{(1-P)+[\chi_H - w_H]P'e_H^*}\right| > \frac{P}{1-P}$, due to the fact that the agent's effort is private information. The slope of the agent's indifference curve is $\frac{dw_H}{dw_L} = -\frac{Pu_{kL}'}{(1-P)u_{kH}'}$. Thus, the concern for the survival of the family business in a competitive product market involves only partial insurance for the agent, as in point A. Since the agent is not fully insured, he would welcome additional insurance—especially nonmarket insurance from an altruistic parent in the form of higher w_L, at the price of $\frac{P}{(1-P)}$. In the case of a risk averse principal, the agent's indifference curve intersects the ZPL_1 at point *B* (dotted-line indifference curve), which is above point *A*, and reflects greater risk sharing between the principal and agent. Figure 2 depicts the impact of nonperformance type wages on the agent's welfare and the firm profits. This would correspond to the case where the parent is altruistic, but operating a family business in an imperfectly-competitive product market. Higher altruism implies higher wage insurance for the child (i.e., higher w_L), which for any given wage contract (w_L, w_H), should raise the child's expected utility, since it lowers the child's effort (Lemma 1). This has the effect of shifting the child's indifference curves to the left. On the other hand, higher w_L implies lower effort, which lowers expected profits. Thus, the ZPL_1 will also shift left to ZPL_2, indicating lower profits for the firm. The new equilibrium is at point *C*. Figure 3 depicts the equity—efficiency tradeoff that a risk averse altruistic parent faces as founder and manager. From Proposition 2, point *D* depicts the situation with the child enjoying higher wage insurance, but at the cost of lower expected profits for the family firm (ZPL_2), than in case of a risk averse non-altruistic principal (point B on ZPL_1).

The aforementioned discussion reveals that, unless the family business is operating in an imperfectly competitive market (and even then, monopoly rents present an upper bound), paternalism cannot be a reason for why family businesses continue to exist and compete with other business entities in the long run. For the family business to continue to survive in a competitive market, the family and the business are better off having the parent replace the child with another nonfamily employee. In this case altruism will be absent, and the parent can then make side transfers to the child without having the child influence the business profits directly through his effort level.

Note here that the child has no incentive to seek employment elsewhere, for as Proposition 2 shows, he uses his parent's altruism to get paid above his marginal product. In the case where the parent is not able to or is unwilling to remove the child from the business, the family business will eventually have to be sold or exit the market, losing out to the more efficient nonfamily businesses. Thus, the Chinese proverb "three generations poor," reflects the fact that even prosperous family businesses rarely survived past three generations; highlighting the danger posed by asymmetric altruism on the survival of family businesses.

Finally, as discussed earlier, it may be easier to explain the continued survival of family businesses in economies where they possess market power. However, the question now becomes how do we explain the continued existence and success of family businesses, even in markets where competition is quite fierce? As the next two sections will show, trust and succession are two important factors that provide family businesses with the strategic edge needed to compete successfully with nonfamily businesses, even in perfectly competitive markets.

III. Trust and Symmetric Altruism

Interestingly, researchers have noted that a distinctive feature that separates successful family businesses from nonfamily ones (or unsuccessful family businesses) is the shared trust and mutual love (however difficult that is to gauge) between the family members engaged in running the business.[21] It is also well documented that trust is an extremely important factor in the choice of employees and business partners among Asian businesses.[22] For example, Chinese businesses prefer to employ relatives, clansmen, and people from the same village. Kao (1996) reports that trust plays a key role in the choice of business partners by Taiwanese firms. Moreover, it is also known that Korean "chaebols" and Japanese " keiretsus" are ultimately family owned. In light of the dysfunctional role of altruism, this leads us to ask, how does trust differ from one-sided altruism? This section will analyze how trust can be an important factor in giving rise to successful family businesses.

In the context of nonmarket settings, and in the presence of perfect and complete information, Stark (1989) and Bernheim and Stark (1988) show that altruism alone gives rise to a moral hazard problem between partners. They argue that only in the unlikely case of "perfect altruism," that is, where both partners place the same weight on each other's utility as on their own (i.e., $\beta = 1$), symmetric altruism resolves conflicts between partners and leads to cooperation. Moreover, they refer to altruism in this case as trust, forgiveness, and insurance.

Interestingly, in a family business, both market forces (business) and nonmarket considerations (family) are present along with informational asymmetries. To highlight the role of trust and symmetric altruism, the child's utility is modified, such that the child is now also altruistic toward the parent. Moreover, I will focus on the case where altruism is symmetric, that is, $\beta_p = \beta_k = \beta$, since the case of asymmetric altruism has already been discussed in the previous section.

The child's expected utility is now

$$EU_k = P[u_{kL} + \beta u_{pL}] + (1-P)[u_{kH} + \beta u_{pH}] - v(e).$$

The first order condition is

[21] See, for example, Gersick et. al. (1997) and Davis (1983).

[22] See, for example, Landa (1976), Kao (1996)and Kiong (1996).

$$P'[(u_{kL}+u_{pH})+\beta(u_{pL}+u_{pH})]-v'(e)=0, \tag{6}$$

which gives $e^* = e(w_L, w_H, x_L, x_H, r; \beta)$.

As the next result shows, higher altruism on the part of the child leads to higher effort.

Lemma 2

$$e_1 \equiv \frac{de^*}{dw_L} = -\frac{P'(u_{kL}'-\beta y_{pL}')}{\Delta} < 0, e_2 \equiv \frac{de^*}{dw_H} = -\frac{-P'(u_{kH}'-\beta y_{pH}')}{\Delta} > 0,$$

$$e_3 \equiv \frac{de^*}{dx_L} = -\frac{P'\beta u_{pL}'}{\Delta} < 0, e_4 \equiv \frac{de^*}{dx_H} = -\frac{-P'\beta u_{pH}'}{\Delta} > 0,$$

$$\mathrm{e}_5 \equiv \frac{de^*}{d\beta} = -\frac{P'(u_{pL}-u_{pH})}{\Delta} > 0,$$

where $\Delta \equiv \frac{\partial^2 EU_k}{\partial e^2} = P''[(u_{kL}-u_{kH})+\beta(u_{pL}-u_{pH})]-v''(e) < 0.$

In contrast to the previous case (see condition (2) and Lemma 1), the child's altruism induces him to internalize the impact of his choice of effort on his parent's welfare. As the following result shows, this will have a mitigating effect on the agency problem.

Define $e_S^* \equiv e(w_L, w_H, x_L, x_H, \beta)$ as the optimal effort that solves (6), and $e_B^* \equiv e(w_L, w_H)$ as the one corresponding to condition (2). The next result establishes that the child's effort is increasing under symmetric altruism.

Proposition 3 *Under symmetric altruism, the child's effort is higher than a nonfamily employee's effort, i.e.,* $e_S^* > e_B^*$, *also* $\left|\frac{e_1^*}{e_{wL}^*}\right| < 1$.

Proof: First, define the following function

$$F(\beta, e) \equiv P'[u_{kL}-u_{kH}]-v'(e)+\beta P'[u_{pL}-u_{pH}]=0,$$

where if $\beta = 0$ the above f.o.c. corresponds to the f.o.c. in (2) whereas $\beta > 0$ corresponds to the f.o.c. in (6). Using the implicit function theorem,

$$F_\beta = P'[u_{pL}-u_{pH}] > 0 \Rightarrow \frac{de^*}{d\beta} > 0 \Rightarrow e_S^* > e_B^*.$$

Next, from Lemma 1,

$$e_{wL}^{*} \equiv \frac{de^{*}}{dw_{L}} = -\frac{P' u_{kL}'}{P'(u_{kL} - u_{kH}) - v'(e)} < 0.$$

Notice that the numerator for e_1^* is smaller than that of e_{wL}^*, i.e.,
$0 < -P'(u_{kL}' - \beta u_{pL}') < -P'u_{kL}'$, where $u_{pL} > u_{kL} \Rightarrow u_{kL}' > \beta u_{pL}'$. On the other hand, the denominator for e_1^* is larger in absolute value than that of e_{uL}^*., i.e., $|P''[(u_{kL} - u_{kH}) + \beta(u_{pL} - u_{pH})] - v''(e)| >$ $| P''(u_{kL}-u_{kH}) - v''(e) |$, which implies $\left|\frac{e_1^*}{e_{wL}^*}\right| < 1$.

As β_k rises, the child internalizes the impact of his own actions on the parent's welfare. As a result, the moral hazard problem between parent and child is mitigated. Thus, higher wage insurance, w_L, will have less of a disincentive effect on his effort, when compared to a nonfamily employee.

The next result reveals that the parent reacts to the altruistic child's increased effort by reducing the dispersion between the wages, raising the insurance aspect of the wage contract and reducing the risk that the child faces. Let w_L^S be the optimal wage that solves the parent's first order condition under symmetric altruism.

Proposition 4 *Under symmetric altruism, the concern for the success of the family business induces the parent/principal to raise the insurance aspect of the wage contract for child, i.e.,* $w_L^S > w_L^B$, *and to reduce risk sharing.*

Proof: See Appendix.

Thus, under symmetric altruism, the child's effort rises (e_5^* >0), which reduces the probability of low expected profits ($P' < 0$). The parent, in return, raises the insurance aspect of wages, that is, raises w_L^*.

A. Trust and Efficiency

The positive impact of trust and symmetric altruism on expected profits can be easily seen from inspecting the equilibrium condition (3)

$$\frac{\partial w_H^*}{\partial \beta} = [x_L - w_L]\frac{P' e_5^*}{(1-P)^2} > 0.$$

The child's altruism toward the parent induces him to raise his effort, which raises the family business' expected profits, and as a result, increases the child's expected wages (see Figure 4). Symmetric altruism results in better aligning the incentives between the parent and the child, since the agency problem is mitigated. As β rises the disincentive effect of higher w_L on the child's choice of effort level is reduced. This can be easily seen from inspecting e_1^* in Lemma 2. Also, as $\beta \rightarrow 1$, the second term in the parent's first order condition (9)—reflecting the negative impact of the moral hazard on the parent's utility—disappears. Thus, the parent is less concerned with possibility of his altruistic child taking advantage of his kindness. As a result, the parent will raise the insurance aspect of the wage contract by raising w_L^*. Moreover, the positive effect of symmetric altruism and trust on the child's effort and firm profits may explain the empirical evidence advanced by McConaughy et. al. (1998) that family run firms seem to perform better than nonfamily firms that are similar in size, industry and managerial ownership. Nevertheless, even if there is trust or perfect altruism, $\beta = 1$, condition (9) reveals that there is no full insurance ($w_L^* \neq w_H^*$), and the parent will not equate the marginal utilities across the states of nature. As a result, the parent and child continue to share part of the risk from the business activity.

Trust can then explain why family businesses arise and succeed. When present, trust and symmetric altruism align the incentives of the family members involved in running the business. Even when the parent is unable to monitor the child's actions, the parent knows that the child is "doing the right thing." This endogenous behavior on the part of the child arises from the child's internalizing the impact of his actions on his parent's welfare. Note also that the child in such an environment has no incentive to seek employment outside the family business. His hard work is rewarded by his parent by mitigating the effect of income risk arising from the business activity.

The environment of trust and symmetric altruism is a win-win situation for the family and the business as whole. Symmetric altruism when high results in reducing agency costs, by obviating the need for costly monitoring and state-contingent wage contracts. On the other hand, the child's effort is high, resulting in higher expected profits for the business and the greater wealth for the family. Thus, trust provides the family business with a competitive edge versus other firms in the market.

It is worth noting here that in contrast with a nonaltruistic employee, the altruistic child is willing to share more of the business risk with his altruistic parent, who happens to be the residual claimant.[23] The child's willingness to expend high effort and to share the ups and downs of the business with his parent, and the parent's recognition of this sentiment, reduces the uncertainty regarding the actions and sentiments of family members. This engenders an environment of loyalty, and a preference by the parent for employing and rewarding his child,

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[23] This can seen from inspecting the slope of the indifference curve of the altruistic child $\left|\frac{dw_H}{dw_L}\right| = \frac{P(u'_{kL} - \beta u'_{pL})}{(1-P)(u'_{kH} - \beta u'_{pH})} < \frac{Pu'_{kL}}{(1-P)u'_{kH}}$. A sufficient condition for this to hold is that the parent's MRS_{LH} is greater than that of the child, which is intuitive, given that the parent is the residual claimant, and as a result is bearing more risk than the child.

rather than hiring an outsider. To family business observers, this situation may give the impression that family members know each other's preferences, or can monitor each other's actions (see for example, the aforementioned observation by De Angelo and De Angelo (1985)and Fama and Jensen (1983) on page 2, among others).

Figure 4 depicts the impact of trust on the child's welfare and firm profits. In Figure 4, the altruistic child's indifference curve would intersect the ZPL_1 to the left of point B, which is where the nonaltruistic agent's indifference curve intersects the wage schedule. However, the child's altruism results in higher effort, which in turn leads to higher expected profits. Thus, ZPL_1 shifts to the right to ZPL_3. As Proposition 4 shows, the parent recognizes this, and rewards the child with higher insurance type wages at point F placing him closer to the certainty line, while maintaining the nonaltruistic employee on a higher performance based compensation package, at point B.

IV. Succession and Inheritance

One of the most difficult tasks facing the parent as founder-manager is having eventually to relinquish the business to his heir.[24] Perhaps the problem is in the fact that he feels that the business is "essentially an extension of himself, a medium for his personal gratification and achievement above all," (Levinson (1971, p. 94)). Often, the parent, even after choosing a successor, refuses to retire. This results in an atmosphere of continuous conflict between the parent and child because of differences in altruism, vision, and style of management, among other things, which may be detrimental to the business. The child is finally able to take over the business reins either upon the death of the parent or after the parent is forced out of his position in the family business (see Barnes and Hershon (1976)). In any case, until the child inherits the business, he has to prove himself while enduring, often, being underpaid.

In this section, I focus on the impact of succession on the relationship between the parent and child as employee and heir. How does the fact that the child will eventually inherit the business affect the child's effort decision and his compensation package? Bruce and Waldman (1990), in a two period model with perfect and complete information, point out that a child, in anticipation of a transfer (a bequest or will) from the parent, will overconsume and induce a higher transfer from the parent. This result in the economic theory of the family is called the "Samaritan's Dilemma" (see Buchanan (1975)). However, as the next result shows, that may not obtain in a family business.

The static model with two sided altruism is now extended to two periods, where the altruistic parent and child overlap for one period. In the first period, the parent declares a wage function (w_L, w_H), and the child decides on his effort level. Subsequently, the child, succeeds the parent and inherits the business in the next period.

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[24] That is not to say that nonfamily businesses do not face the same daunting task of finding a replacement and then effecting the transition (see *Business Week* (1997)).

The expected utility for the child is now

$P\,[(u_{k,1}(w_L) + \beta u_{pL}) + \gamma u_{k,2}(x_L)] + (1\text{-}P)[\,(u_{k,1}(w_H) + \beta u_{pH}) + \gamma u_{k,2}(x_H)] - v(e),$

and I define the first period felicities as $u_{kL,1} \equiv u_{k,1}(w_L)$, $u_{kH,1} \equiv u_{k,1}(w_H)$, and the second period felicities as $u_{kL,2} \equiv u_{k,2}(x_L)$, $u_{kH,2} \equiv u_{k,2}(x_H)$. The parameter $0 < \gamma < 1$ is the intertemporal discount factor.

The parent's expected utility is now

$EU_p = P[\,u_{pL} + \beta(\,u_{kL,1} + \gamma u_{kL,2})\,] + (1\text{-}P)\,[u_{pH} + \beta\,(\,u_{kH,1} + \gamma u_{kH,2})\,] - \beta v,$

The child's first order condition is

$$P'[(u_{kL,1} - u_{kH,1}) + \beta(u_{pL} - u_{pH})] - v' + \gamma P'[u_{kL,2} - u_{kH,2})] = 0, \qquad (7)$$

which gives $e^* = e(w_L, w_H, x_L, x_H, r; \gamma, \beta)$. Define e^*_{IS} as the optimal effort level that solves (7), in the case where the altruistic child inherits the business, and recall that e^*_S is the optimal effort for the case where the child does not, as in the first order condition (6).

Proposition 5 *Under symmetric altruism, the child who expects to inherit the business expends higher effort than a child who does not expect to inherit the family firm.*

$e^*_{IS} > e^*_S$, also $\left|\dfrac{e^{IS}_L}{e_1}\right| < 1.$

Proof: First, consider the following function

$G(\gamma, e) \equiv P'[(u_{kL,1} - u_{kH,1}) + \beta(u_{pL} - u_{pH})] - v' + \gamma P'[(u_{kL,2} - u_{kH,2})] = 0,$

where if $\gamma = 0$, the above expression corresponds to the first order condition (6), otherwise $\gamma > 0$ corresponds to (7). Using the implicit function theorem,

$$G_\gamma = P'(u_{kL,2} - u_{kH,2}] > 0 \Rightarrow \frac{de^*}{d\gamma} > 0 \Rightarrow e^*_{IS} > e^*_S.$$

Next, from (7), $e^{IS}_L \equiv \dfrac{de^*}{dw_L} = -\dfrac{P'(u'_{kL,1} - \beta u'_{pL})}{p''[(u_{kl,1} - u_{kH,1}) + \beta(u_{pL} - u_{pH})] - v''[u_{kL,2} - u_{kH,2}]} < 0$. On the other hand, from Lemma 2, $e_1 \equiv \dfrac{de^*}{dw_L} = -\dfrac{P'(u'_{kL,1} - \beta u'_{pL})}{p''[(u_{kl,1} - u_{kH,1}) + \beta(u_{pL} - u_{pH})] - v''} < 0$. It is clear that while the numerators in both expressions are identical, the absolute value of the denominator in e_L^{IS} is greater than that in e_1 (by $\gamma P''[u_{kL,2} - u_{kH,2}] < 0$).

Thus $$\left|\frac{e_L^{IS}}{e_1^*}\right| = \frac{P''[(u_{kL,1} - \beta u_{kL}) + \beta(u_{pL} - u_{pH})] - v''}{P''[(u_{kl,1} - u_{kH,1}) + \beta(u_{pL} - u_{pH})] - v'' + \gamma P''[u_{kL,2} - u_{kH,2}]} < 1.$$

The above result implies that the prospect of succeeding the parent and inheriting the business induces the child to expend higher effort and be less susceptible to take advantage of the parent's generosity expressed through positive insurance type wages, w_L^*. Thus, the Samaritan's Dilemma is mitigated in the context of the family business. The intuition here is that the size of the transfer that the child expects to receive in the second period is positively correlated with the child's effort in the first period. Thus, the higher the child's effort, the larger is the value of the firm, and as a result, the larger is his wealth. Moreover, the higher the child's first period effort, the higher is his first period consumption. It is also clear that the child's willingness to expend high effort depends on his patience (high γ).[25] Moreover, the aforementioned result accords with the empirical observations of Morck et. al. (1988) and McConaughy et. al. (1998), who find that family controlled firms—in contrast to nonfamily businesses—are more efficient and valuable.

Finally, the constructive effect of inheriting the business on the child's choice of effort induces the parent to provide more insurance type wages. Define w_L^{IS} as the optimal wage for the case where the child inherits the business from the parent.

Proposition 6 *Under symmetric altruism, in the case where the child expects to take over the family firm, the parent/principal is more likely to raise the insurance aspect of the wage contract, i.e.,* $w_L^{IS} > w_L^S$, *and to reduce risk sharing.*

Proof: Refer to the Appendix.

The coincidence of objectives between the altruistic parent and the child is induced by the child's altruism towards his parent and his stake in increasing the firm's output (induced by his patience), and ultimately his own inheritance. This mitigates the agency problem between the players, and allows the parent to offer greater wage insurance in the first period—through higher w_L^* and lower w_H^*—while leaving the child, in the second period, to bear the risk of his own effort decision.

[25] Rogers (1994, p.474) argues that young adults have high rates of time preference, with the peak being either in their twenties or thirties. The difference in the rates of time preference between the young adults and their older parents—which may be a source of conflict between the generations—diminishes as the children age.

However, even in the case where the child is selfish, but expects to inherit the business, his effort will be higher than a nonfamily employee who does not expect to inherit the business. Moreover, the parent, in this case, would still reward the child by reducing the incentive component of the compensation package. The following result summarizes this discussion. First, define e_I^* and w_L^I to be the optimal effort level and the corresponding optimal wage level, for the case where the child is selfish, but expects to inherit the business.

Corollary1

$e_I^* > e_B^* \Rightarrow w_L^I > w_L^B$.

Proof: Refer to the Appendix.

Finally, the following result summarizes the aforementioned findings

Theorem 1

$w_L^{IS} > w_L^S > w_L^B$ while $e_{IS}^* > e_S^* > e_B^*$.

Proof: The proof follows easily from Propositions 3, 4, 5, and 6.

Interestingly, the above result suggests that the family business characterized by trust and and a clear line to succession provides the highest degree of wage insurance against business risk for the child, but enjoys the highest levels of commitment and effort from him. Thus, differential wages may not be enough to engender the desired effort level from employees, but other characteristics of the job such as shared values, trust, commitment, and ownership may be of importance. Trust and succession mitigate the agency problem and reduce the moral hazard problem. The agent now internalizes the cost of his lower effort on his welfare and on the principal's welfare as well. The coincidence of objectives is rewarded by the principal by reducing his reliance on performance based compensation in rewarding the agent. This result provides an explanation for Kole's (1997, p. 92) observation that in family firms there is less reliance on explicit compensation contracts, and even when they do exist, they are typically not performance based.

V. Discussion and Conclusion

This paper develops a microtheoretic model that provides a promising framework for tackling the many interesting issues that influence family businesses. The framework is rooted in the well established literature on the family as well as in the neoclassical theory of the market. The model brings to light factors that help explain why family businesses continue to exist, flourish and compete with other business entities in developing as well as in industrialized economies. One important factor is the discipline that market forces impose on the relationship between the family members and the internal governance of family businesses. Nepotism, favoritism and other family issues are held in check by the need for the family business to compete and succeed. In contrast, in the presence of less than perfect market competition, dysfunctional family dynamics such as low effort, exacerbated agency problems and low output continue to persist at the expense of efficiency. Recent work by Bhattacharya and Ravikumar (1999) suggests that lack of capital market development may be another important factor that prolongs the presence of family business, despite its inefficiency. Proposition 1 shows that when family members recognize that the relationship has fundamentally changed due to the presence of competition in the product market, then the parent is more likely to provide incentives for higher effort that induce the child to work harder. Thus, when parent and child internalize the impact of their own actions on the viability of the family firm, the proper incentives are chosen so as to ensure the success of the business.

Another important finding is the role of trust in setting apart family businesses from other business entities. Whereas it is natural to assume that family businesses are characterized by mutual caring and trust, the paper brings to light the pivotal role of mutual trust in enhancing productivity, mitigating the agency problem and the costs associated with it. In this respect, Propositions 3 and 4 summarize how trust can be a reason behind why family firms form, and distinguishes successful family business from unsuccessful ones. However, these results highlight the difficulty in developing trust, as it demands a high level of mutual altruism. Thus, Proposition 2 shows the dysfunctional role of one-sided altruism, and its negative impact on the survival of the family business. Theorem 1 shows that attempts at fostering trust among employees in nonfamily businesses can go a long way in raising their productivity over and above what monetary compensation can achieve. This result also helps explain why firms may want to behave well toward employees even if it is not in the firm's short-run interest (for example, not firing employees as soon as their wages rose above their marginal product).

Section 5 highlights the impact of succession and inheriting the business on the respective choices of the parent and the child. In the context of the relationship between the family and formal labor markets, Holtz-Eakin et. al. (1993), in an empirical study, argue that inheritance has a negative effect on the labor supply and labor participation of the expected recipients. The implication of the timing of inheritance on the beneficiaries' actions has meant an inevitable tradeoff between Becker's (1991) "Rotten-Kid-Theorem" and Buchanan's (1975) "Samaritan's Dilemma."[26] These undesirable effects have led some researchers to argue for various strategies, among them precommitment, or in-kind transfers.[27] In contrast, Proposition 5 and Corollary 1 show that inheriting the family business has the exact opposite effect of increasing the child's effort, while Proposition 6 reveals that the parent rewards the child's choice of effort by reducing risk sharing. This result is also reminiscent of Becker's (1991) "Rotten-Kid-Theorem," where the selfish child, as the residual claimant of the family business, finds it in his own self interest to maximize the family income, thereby ensuring himself a larger transfer from the parent. Thus, employing family members with the promise of eventually inheriting the family firm (or some share of it) may provide a solution to such undesirable behaviors caused by

[26] See Hirshleifer (1977) and Bruce and Waldman (1990).

[27] See, for example, Bruce and Waldman (1990, 1991), Bergstrom (1989), and Chami (1996, 1998), among others.

altruistic transfers. However, as noted earlier, this result depends on the child's rate of time preference (γ). The impact of succession and exogenous altruism on the agent's behavior here also accords with the findings of Rotemberg (1994, p.712), who analyzes the role of altruism in the relationship between a subordinate and his manager in the workplace. Rotemberg shows that when there is strategic complementarity between the actions of the two parties, then beneficial altruism on the part of the manager is induced in equilibrium. Moreover, Mulligan (1997, p.328), in a model with endogenous loyalty, shows that investment in loyalty on the part of the manager is justified, as it leads to higher employee productivity and loyalty, and alleviates the need for performance based compensation. As in Mulligan's framework, here exogenous trust induces the child to endogenize the impact of his actions on the parent's welfare, thus alleviating the agency problem and the need for the parent to resort to performance based compensation. Similarly, succession induces the selfish child to expend higher effort—even in the presence of nonperformance based wages— as higher effort increases the probability of a larger inheritance.

Interestingly, the paper also reveals that what may be perceived by outsiders or nonfamily employees as favoritism by the parent toward the child (in terms of higher insurance type wages) may not necessarily be the case. Theorem 1 reveals that the mutual trust between parent and child, and the child's expectation of inheriting the business, reduce the agency problem and induce higher effort from the child. Moreover, the child, in contrast to a nonfamily employee, is willing to share more of the business risk with the parent. The parent, in return, rewards the child and reduces the risk sharing, by relying less on performance based compensation. However, that is not the case for a nonfamily employee who may neither share the founder's trust, nor expects to inherit the business.[28] The employee demands more income insurance from the founder than the child would. As a result, the employee's effort is lower, and his wage contract involves more risk sharing with the founder, when compared to the founder's child who also expects to succeed the parent. Thus, what may appear to outsiders as unmerited family favoritism might be market justified rewards of the shared trust and commitment to the family business between parent and child.

Finally, can the internal benefits that accrue to a family business characterized by trust and loyalty—in terms of lower agency costs and higher efficiency—be extended to its dealings with other businesses and creditors in the market? Evidence advanced by Bopaiah (1998) and others would seem to suggest that indeed lenders look favorably at family controlled businesses.[29] This seems to hold even when family businesses are paired with nonfamily businesses of similar size. How the internal structure of the family business affects its dealings with the other firms and the capital market remains an open question, and a topic for future research

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[28] In this context, the child who does not expect to inherit the business and is selfish ($\beta_k = 0$) resembles a nonfamily employee.

[29] See Kao (1996) on how trust motivates the choice of business partner by Taiwanese firms.

Figure 1. Market Equilibrium With Moral Hazard

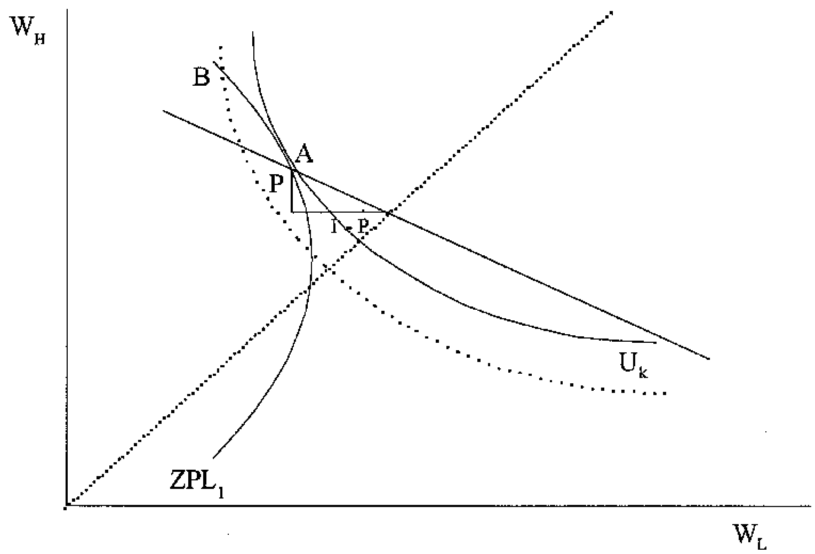


Figure 2. Market Equilibrium With Asymmetric Altruism

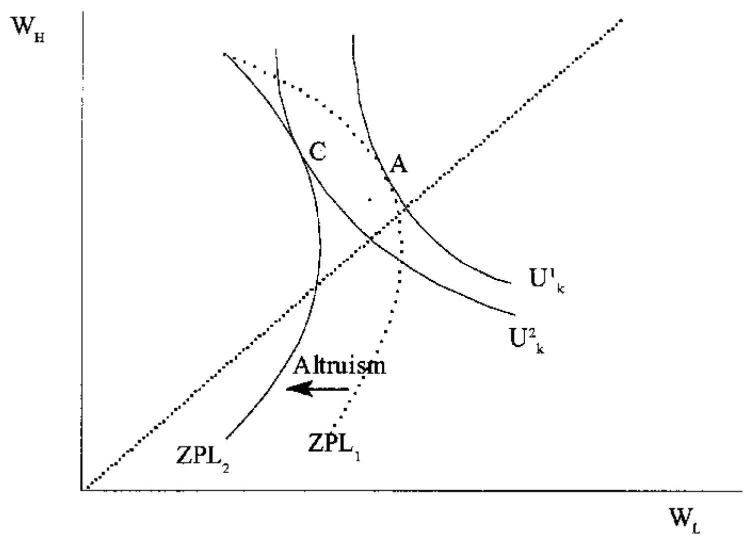


Figure 3. Agency Versus Asymmetric Altruism With A Risk Averse Founder

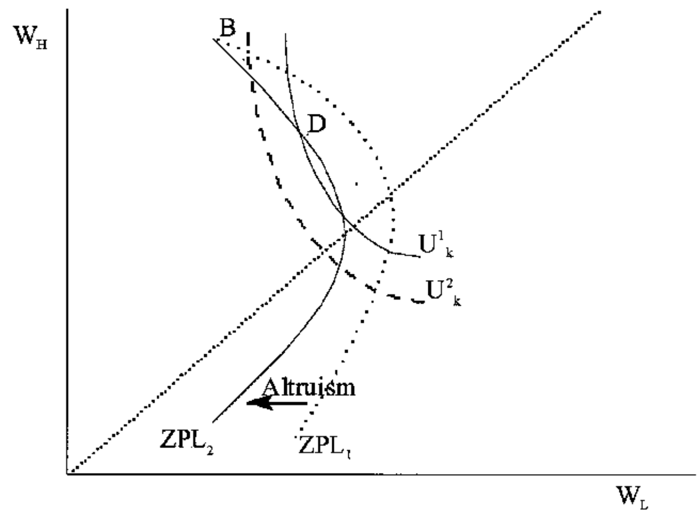
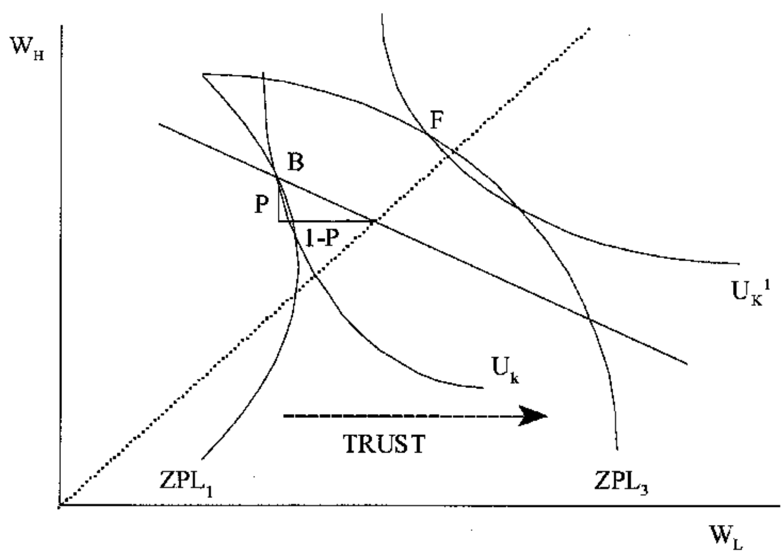


Figure 4. Market Equilibrium With Trust



Asymmetric Altruism

Equations (2) and (3) implicitly define e and w_H as functions of w_L. Denote these as e^{**} and w_H^{**}. Differentiating the system of equations with respect to (e^{**}, w_H^{**}, w_L), we can calculate the total derivatives $\frac{dw_H^{**}}{dw_L}$ and $\frac{de^{**}}{dw_L}$. Restating the above defining equations (3) and (2) as the following two functions $F(w_H^{**}, e^{**}, w_L)$ and $G(w_H^{**}, e^{**}, w_L)$, respectively, we have:

$$F(w_H^{**}, e^{**}, w_L,) \equiv (1 - P(e^{**}))\,[x_H - w_H^{**}] + P(e^{**})\,[x_L - w_L] = 0.$$

and

$$G(w_H^{**}, e^{**}, w_L) \equiv (u_{kL} - u_{kH})\,P'(e^{**}) - v'(e^{**}) = 0,$$

and where it is understood that $u_{kL} = u_k(w_L)$, and $u_{kH} = u_k(w_H^{**}(w_L))$.

Differentiating the above two conditions yields

$$\begin{bmatrix} F_1 & F_2 \\ G_1 & G_2 \end{bmatrix} \begin{bmatrix} dw_H^{**} \\ de^{**} \end{bmatrix} = \begin{bmatrix} -F_3 dw_L \\ -G_3 dw_L \end{bmatrix},$$

where

$$\begin{aligned}
F_1 \equiv \frac{\partial F}{\partial w_H^{**}} &= -(1 - P(e^{**})) < 0, \\
F_2 \equiv \frac{\partial F}{\partial e^{**}} &= -P'(e^{**})\,[(x_H - w_H^{**}) - (x_L - w_L)] > 0, \\
F_3 \equiv \frac{\partial F}{\partial w_L} &= -P(e^{**}) < 0, \\
G_1 \equiv \frac{\partial G}{\partial w_H^{**}} &= -P'(e^{**})u'_{kH} > 0, \\
G_2 \equiv \frac{\partial G}{\partial e^{**}} &= [u_{kL} - u_{kH}]\,P''(e^{**}) - v''(e^{**}) < 0, \\
G_3 \equiv \frac{\partial G}{\partial w_L} &= P'(e^{**})u'_{kL} < 0.
\end{aligned}$$

Now,

$$\frac{dw_H^{**}}{dw_L} = \frac{\begin{vmatrix} -F_3 & F_2 \\ -G_3 & G_2 \end{vmatrix}}{|J|},$$

with the Jacobian determinent $|J| > 0$, the numerator is:

$$-F_3G_2 + G_3F_2 = \underbrace{P\left[(u_{kL} - u_{kH})\,P'' - v''\right]}_{(-)} + \underbrace{\left[-P'^2 u'_{kL}\right][(x_H - w_H^{**}) - (x_L - w_L)]}_{(-)} < 0,$$

where $P = P(e^{**})$. As a result $\frac{dw_H^{**}}{dw_L} < 0$.

Next,

$$\frac{de^{**}}{dw_L} = \frac{\begin{vmatrix} F_1 & -F_3 \\ G_1 & -G_3 \end{vmatrix}}{|J|},$$

with the Jacobian determinent $|J| > 0$, the numerator is:

$$-F_1G_3 + G_1F_3 = \underbrace{(1-P)P'u'_{kL}}_{(-)} + \underbrace{PP'u'_{kH}}_{(-)} < 0,$$

where $P = P(e^{**})$. As a result $\frac{de^{**}}{dw_L} < 0$.

Proof of Proposition 2: When altruism is absent altogether, that is $\beta = 0$, the f.o.c. for the parent, condition (4) becomes

$$-Pu'_{pL} + [u_{pL} - u_{pH}]\, P'\frac{de^{**}}{dw_L} + (1-P)\left[-u'_{pH}\right]\frac{dw_H^{**}}{dw_L} = 0. \tag{8}$$

Denote by w_L^T the solution to the above f.o.c. (8). Next, define the function $F(\beta, w_L)$ as

$$F(\beta, w_L) \equiv -Pu'_{pL} + [u_{pL} - u_{pH}]\, P'\frac{de^{**}}{dw_L} + (1-P)\left[-u'_{pH}\right]\frac{dw_H^{**}}{dw_L} + \beta\left[Pu'_{kL} + (1-P)u'_{kH}\frac{dw_H^{**}}{dw_L}\right] = 0.$$

Now if $\beta = 0$ the above condition reduces to the f.o.c. in (8) whereas $\beta > 0$ gives the f.o.c. (4). Using the implicit function theorem,

$$F_\beta = \left[Pu'_{kL} + (1-P)\left[u'_{kH}\right]\frac{dw_H^{**}}{dw_L}\right] > 0,$$

which follows from the fact that $u'_{kL} > u'_{kH}$, and that as long as $P \leq 0.5$ then $\frac{dw_H^{**}}{dw_L} < 1$. As a result,

$$\frac{dw_L^*}{d\beta} > 0 \Rightarrow w_L^B > w_L^T.$$

■

Trust and Symmetric Altruism

Proceeding in a similar way as in the previous section, the pair of constraints (3) and (6) implicitly define $\bar{w}_H$ and $\bar{e}$ as functions of w_L. These conditions are restated as the following two functions $F(\bar{w}_H, \bar{e}, w_L)$ and $G(\bar{w}_H, \bar{e}, w_L)$, respectively:

$$F(\bar{w}_H, \bar{e}, w_L) \equiv (1 - P(\bar{e}))\,(x_H - \bar{w}_H) + P(\bar{e})\,(x_L - w_L) = 0.$$

and

$$G(\bar{w}_H, \bar{e}, w_L) \equiv [u_{kL} - u_{kH}]\, P'(\bar{e}) - v'(\bar{e}) + \beta P'(\bar{e})[u_{pL} - u_{pH}] = 0,$$

where $u_{kL} = u_k(w_L)$, and $u_{kH} = u_k(\bar{w}_H(w_L))$.

Differentiating the above two conditions yields

$$\begin{bmatrix} F_1 & F_2 \\ G_1 & G_2 \end{bmatrix} \begin{bmatrix} d\bar{w}_H \\ d\bar{e} \end{bmatrix} = \begin{bmatrix} -F_3 dw_L \\ -G_3 dw_L \end{bmatrix},$$

where

$$\begin{aligned}
F_1 \equiv \frac{\partial F}{\partial \bar{w}_H} &= -(1 - P(\bar{e})) < 0, \\
F_2 \equiv \frac{\partial F}{\partial \bar{e}} &= -P'(\bar{e})\,[(x_H - \bar{w}_H) - (x_L - w_L)] > 0, \\
F_3 \equiv \frac{\partial F}{\partial w_L} &= -P(\bar{e}) < 0, \\
G_1 \equiv \frac{\partial G}{\partial \bar{w}_H} &= P'(\bar{e}) \left[-u'_{kH} + \beta u'_{pH}\right] > 0, \\
G_2 \equiv \frac{\partial G}{\partial \bar{e}} &= [u_{kL} - u_{kH}]\, P''(\bar{e}) - v''(\bar{e}) + \beta P''(\bar{e})[u_{pL} - u_{pH}] < 0, \\
G_3 \equiv \frac{\partial G}{\partial w_L} &= P'(\bar{e})[u'_{kL} - \beta u'_{pL}] < 0.
\end{aligned}$$

Now,

$$\frac{d\bar{w}_H}{dw_L} = \frac{\begin{vmatrix} -F_3 & F_2 \\ -G_3 & G_2 \end{vmatrix}}{|J|},$$

with the Jacobian determinent $|J| > 0$, the numerator is:

$$\begin{aligned}
-F_3 G_2 + G_3 F_2 = \quad & \underbrace{P\left[[u_{kL} - u_{kH}]\, P'' - v'' + \beta[u_{pL} - u_{pH}] P''\right]}_{(-)} \\
& + \underbrace{\left[-P'^2 \left[u'_{kL} - \beta u'_{pL}\right]\right] [(x_H - \bar{w}_H) - (x_L - w_L)]}_{(-)} < 0,
\end{aligned}$$

where $P = P(\bar{e})$. As a result $\frac{d\bar{w}_H}{dw_L} < 0$.

Next,

$$\frac{d\bar{e}}{dw_L} = \frac{\begin{vmatrix} F_1 & -F_3 \\ G_1 & -G_3 \end{vmatrix}}{|J|},$$

with the Jacobian determinent $|J| > 0$, the numerator is:

$$-F_1G_3 + G_1F_3 = \underbrace{(1-P)P'\left[u'_{kL} - \beta u'_{pL}\right]}_{(-)} + \underbrace{[-PP']\left[-u'_{kH} + \beta u'_{pH}\right]}_{(-)} < 0,$$

where $P = P(\bar{e})$. As a result $\frac{d\bar{e}}{dw_L} < 0$.

Proof of Proposition 4: The first order condition for the parent is now

$$\frac{\partial EU_p}{\partial w_L} = P\left[-u'_{pL} + \beta u'_{kL}\right] + (1-\beta)\left[u_{pL} - u_{pH}\right]P'\frac{d\bar{e}}{dw_L} + (1-P)\left[-u'_{pH} + \beta u'_{kH}\right]\frac{d\bar{w}_H}{dw_L} = 0, \tag{9}$$

where, now, w_L^S is the optimal wage w_L^* that solves (9). Let $\bar{e_1} \equiv \frac{d\bar{e}}{dw_L}$, and define the following function $\Psi(\theta, w_L)$ as

$$\Psi(\theta, w_L) \equiv P\left[-u'_{pL} \div \beta u'_{kL}\right] + (1-\theta\beta)\left[u_{pL} - u_{pH}\right]P'\frac{d\bar{e}}{dw_L} + (1-P)\left[-u'_{pH} + \beta u'_{kH}\right]\frac{d\bar{w}_H}{dw_L} = 0,$$

where if $\theta = 0$, then the above f.o.c. is (4) (since, in this case, $\bar{e} = e^{**}$) whereas $\theta = 1$ gives the f.o.c. (9). Note that the parameter θ also enters $\bar{e_1}$ in the following way:

$$\bar{e_1} \equiv \frac{d\bar{e}}{dw_L} = \frac{(1-P)P'[u'_{kL} - \theta\beta u'_{pL}] - PP'[-u'_{kH} + \theta\beta u'_{pH}]}{|J|(\theta)} < 0,$$

where

$$\begin{aligned} |J|(\theta) = \quad & -(1-P)\left[(u_{kL} - u_{kH})P'' - v'' + \theta\beta(u_{pL} - u_{pH})P''\right] \\ & + P'^2\left[(x_H - w_H) - (x_L - w_L)\right]\left[-u'_{kH} + \theta\beta u'_{pH}\right]. \end{aligned}$$

Now,

$$\frac{d\bar{e}_1}{d\theta} = \frac{|J|\frac{dN}{d\theta} - N\frac{d|J|}{d\theta}}{|J|^2},$$

where $N < 0$ is nothing but the numerator in the expression for $\bar{e}_1$, and $|J| > 0$ is the Jacobian determinent. Next,

$$\frac{dN}{d\theta} = \left[-\beta u'_{pL}(1-P)P' - PP'\beta u'_{pH}\right] > 0,$$

and

$$\frac{d|J|}{d\theta} = \underbrace{-(1-P)P''\beta[u_{pL} - u_{pH}]}_{(+)} + \underbrace{P'^2\beta u'_{pH}[(x_H - w_H) - (x_L - w_L)]}_{(+)} > 0.$$

Thus,

$$\frac{d\bar{e}_1}{d\theta} = \frac{|J|\frac{dN}{d\theta} - N\frac{d|J|}{d\theta}}{|J|^2} > 0.$$

Finally, using the implicit function theorem

$$\Psi_\theta = \underbrace{-\beta\left[u_{pL} - u_{pH}\right] P' \frac{d\bar{e}}{dw_L}}_{(+)} + \underbrace{(1-\theta\beta)\left[u_{pL} - u_{pH}\right] P' \frac{d\bar{e}_1}{d\theta}}_{(+)} > 0,$$

This implies that $\frac{dw_L^*}{d\theta} > 0$, *i.e.*, $w_L^S > w_L^B$. ∎

Succession and Inheritance

As in the previous sections, the system of equations (3) and (7) implicitly define $\hat{w}_H$ and $\hat{e}$ as functions of w_L. Restating the two equations as the following two functions, $F(\hat{w}_H, \hat{e}, w_L)$ and $G(\hat{w}_H, \hat{e}, w_L)$, repectively:

$$F(\hat{w}_H, \hat{e}, w_L) \equiv (1 - P(\hat{e}))\,(x_H - \hat{w}_H) + P(\hat{e})\,(x_L - w_L) = 0.$$

and

$$G(\hat{w}_H, \hat{e}, w_L) \equiv \left[(u_{kL,1} - u_{kH,1}) + \beta\,(u_{pL} - u_{pH})\right] P'(\hat{e}) - v'(\hat{e}) + \gamma\left[u_{kL,2} - u_{kH,2}\right] P'(\hat{e}) = 0.$$

Differentiating the above two conditions yields

$$\begin{bmatrix} F_1 & F_2 \\ G_1 & G_2 \end{bmatrix} \begin{bmatrix} d\hat{w}_H \\ d\hat{e} \end{bmatrix} = \begin{bmatrix} -F_3 dw_L \\ -G_3 dw_L \end{bmatrix},$$

where

$$\begin{aligned}
F_1 \equiv \frac{\partial F}{\partial \hat{w}_H} &= -(1 - P(\hat{e})) < 0, \\
F_2 \equiv \frac{\partial F}{\partial \hat{e}} &= -P'(\hat{e})\left[(x_H - \hat{w}_H) - (x_L - w_L)\right] > 0, \\
F_3 \equiv \frac{\partial F}{\partial w_L} &= -P(\hat{e}) < 0, \\
G_1 \equiv \frac{\partial G}{\partial \hat{w}_H} &= P'(\hat{e})[-u'_{kH,1} + \beta u'_{pH}] > 0, \\
G_2 \equiv \frac{\partial G}{\partial \hat{e}} &= \left[(u_{kL,1} - u_{kH,1}) + \beta(u_{pL} - u_{pH})\right] P''(\hat{e}) - v'' + \gamma P''\left[u_{kL,2} - u_{kH,2}\right] < 0, \\
G_3 \equiv \frac{\partial G}{\partial w_L} &= P'(\hat{e})\left[u'_{kL,1} - \beta u'_{pL}\right] < 0,
\end{aligned}$$

where

$$\frac{d\hat{w}_H}{dw_L} = \frac{-F_3 G_2 + G_3 F_2}{|J|} < 0.$$

Next,

$$\frac{d\hat{e}}{dw_L} = \frac{-F_1G_3 + G_1F_3}{|J|} = \frac{1}{|J|}\left[\underbrace{(1-P)P'[u'_{kL,1} - \beta u'_{pL}]}_{(-)} + \underbrace{[-PP'][-u'_{kH,1} + \beta u'_{pH}]}_{(-)}\right] < 0,$$

where $P = P(\hat{e})$. As a result, $\frac{d\hat{e}}{dw_L} < 0$.

Proof of Proposition 6: The first order condition for the parent is now

$$\frac{\partial EU_p}{\partial w_L} = P\left[-u'_{pL} + \beta u'_{kL,1}\right] + (1-\beta)\left[u_{pL} - u_{pH}\right]P'\frac{d\hat{e}}{dw_L} + (1-P)\left[-u'_{pH} + \beta u'_{kH,1}\right]\frac{d\hat{w}_H}{dw_L} = 0. \tag{10}$$

Let w_L^{IS} be the optimal wage that solves the above f.o.c. (10), and define $\hat{e_1} \equiv \frac{d\bar{e}}{dw_L}$. Notice that the parameter γ enters the above condition only through the denomitor, $|J|$, of $\bar{e}_1$, such that:

$$\frac{d\hat{e}_1}{d\gamma} = -\frac{1}{|J|^2}\left[\underbrace{\left[(1-P)P'[u'_{kL,1} - \beta u'_{pL}] - PP'[-u'_{kH,1} + \beta u'_{pH}]\right]}_{(-)}\underbrace{\left[-(1-P)P''[u_{kL,2} - u_{kH,2}]\right]}_{(+)}\right] > 0.$$

Next, define the following function

$$\Psi(\gamma, w_L) \equiv P\left[-u'_{pL} + \beta u'_{kL,1}\right] + (1-\beta)\left[u_{pL} - u_{pH}\right]P'\frac{d\hat{e}}{dw_L} + (1-P)\left[-u'_{pH} + \beta u'_{kH,1}\right]\frac{d\hat{w}_H}{dw_L} = 0.$$

Now, $\gamma = 0$ gives the f.o.c. (9) whereas $\gamma > 0$ gives the f.o.c. (10). Using the implicit function theorem: $\Psi_\gamma = (1-\beta)\left[u_{pL} - u_{pH}\right]P'\frac{d\bar{e}_1}{d\gamma} > 0$. This implies $\frac{dw_L^*}{d\gamma} > 0$, which gives $w_L^{IS} > w_L^S$. ■

Proof of Corollary 1: Define the following function

$$G(\gamma, e) \equiv \left[(u_{kL,1} - u_{kH,1}) + \gamma\,(u_{kL,2} - u_{kH,2})\right]P' - v' = 0,$$

where if $\gamma = 0$, the above expression corresponds to the f.o.c (2), whereas $\gamma > 0$ corresponds to f.o.c. for the case where the child is selfish, but expects to inherit the business. Using the implicit function theorem,

$G_\gamma = P'\left[u_{kL,2} - u_{kH,2}\right] > 0 \Rightarrow \frac{de^*}{d\gamma} > 0 \Rightarrow e_I^* > e_B^*$.

Now, notice that the parent's first order condition is:

$$\frac{\partial EU_p}{\partial w_L} = P\left[-u'_{pL} + \beta_p u'_{kL}\right] + (1-\beta_k)\left[u_{pL} - u_{pH}\right]P'\frac{de}{dw_L} + (1-P)\left[-u'_{pH} + \beta_p u'_{kH}\right]\frac{dw_H}{dw_L} = 0, \tag{11}$$

where, now, we index the parameter β using the subscripts p, k to distinguish between the parent's and the child's altruism. Next, notice, again, that γ only enters $\frac{de}{dw_L}$. Thus re-writing the expression for $\frac{de_1}{d\gamma}$ from the previous proof, and indexing β to distinguish between parent and child altruism, we have:

$$\frac{de_1}{d\gamma} = -\frac{1}{|J|^2} \underbrace{\left[(1-P)P'[u'_{kL,1} - \beta_k u'_{pL}] - PP'[-u'_{kH,1} + \beta_k u'_{pH}]\right]}_{(-)} \underbrace{\left[-(1-P)P''(u_{kL,2} - u_{kH,2})\right]}_{(+)} > 0.$$

Thus, the case where child is selfish $\beta_k = 0$, but expects to inherit the business, *i.e.*, $\gamma > 0$, is:

$$\frac{de_1}{d\gamma} = -\frac{1}{|J|^2} \underbrace{\left[(1-P)P'u'_{kL,1} + PP'u'_{kH,1}\right]}_{(-)} \underbrace{\left[-(1-P)P''(u_{kL,2} - u_{kH,2})\right]}_{(+)} > 0.$$

Finally, define the following function

$$\Psi(\gamma, w_L) \equiv P\left[-u'_{pL} + \beta_p u'_{kL,1}\right] + (1-\beta_k)\left[u_{pL} - u_{pH}\right] P' \frac{de}{dw_L} + (1-P)\left[-u'_{pH} + \beta_p u'_{kH,1}\right] \frac{dw_H}{dw_L} = 0,$$

and note that in the case of the selfish child $\beta_k = 0$. Thus, re-writing $\Psi(\gamma, w_L)$:

$$\Psi(\gamma, w_L) \equiv P\left[-u'_{pL} + \beta_p u'_{kL,1}\right] + \left[u_{pL} - u_{pH}\right] P' \frac{de}{dw_L} + (1-P)\left[-u'_{pH} + \beta_p u'_{kH,1}\right] \frac{dw_H}{dw_L} = 0$$

Using the implicit function theorem: $\Psi_\gamma = \left[u_{pL} - u_{pH}\right] P' \frac{de_1}{d\gamma} > 0$. This implies $\frac{dw_L^*}{d\gamma} > 0$, which gives $w_L^{IS} > w_L^S$. ∎

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