

THE ENTREPRENEUR'S REWARD FOR SELF-POLICING

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The collaboration among people is often subject to shirking; the net gain from the collaboration depends on the contract governing it. I argue that the entrepreneur assumes the role of the residual claimant because his actions are more costly to monitor than those of the factors with which he collaborates. By offering fixed pay contracts to others and himself becoming residual claimant, the entrepreneur curtails his incentive to gain at the expense of his partners, and the net gain from the collaboration is then maximized. Costly monitoring applies to both labor and capital, and thus the entrepreneur may supply both labor services and capital. The entrepreneur's capital serves to guarantee the pay of the other factors.

I. INTRODUCTION

When people collaborate, the contribution of each to the combined output depends on how each is remunerated and on how each is supervised. Those properties of the remuneration and supervision scheme that generate the largest net joint value will be explored here. When the outcome of common effort can vary, "moral hazard" opportunities can arise. These are opportunities of getting goods, at the margin, at less than their resource cost. The hypothesis of this paper is that in order to reduce the moral hazard loss, the person whose contribution to common effort is the most difficult to measure will assume the position of entrepreneur, employing and supervising the other persons. By becoming a residual claimant who bears most of the risk of variable outcome, his incentive to gain at the expense of his partners is curtailed. In order to persuade others to work for him he will commit capital of his own to the venture and form contracts such that the value of his capital will fall if he does not keep his promise to pay them. Capital here serves as a bond, which explains why capital hires labor. Of the contributors to the common effort, those whose pay is fixed will agree to be constrained by their employer so that their newly created moral hazard opportunities can be controlled.

I will make no attempt to cover the entire range of operations or all the sources of variability of large, complex organizations. Rather, I will analyze circumstances requiring a narrow range of contracts; in particular, my entrepreneur always participates in direct production and spends only part of his

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time in supervision. This paper, then, attempts to offer a theory that applies only to a subset of all firms.

The model developed in the following section shows that the owner of the production factor most costly to monitor will assume the role of the entrepreneur who is the residual claimant; circumstances are pointed out under which the model can be tested. The relationship between risk and transaction cost is then elaborated upon, and the analysis of the role played by the entrepreneur's own capital closes the discussion.

II. MORAL HAZARD, MEASURABILITY AND THE ASSIGNMENT OF RISK

Suppose that one person's comparative advantage is in making a specialty product whereas another's is in pursuing such activities as buying raw materials, arranging for space, getting credit, and selling. The two people can collaborate under various contractual arrangements. They can operate, for example, as two independent "firms," as sharing partners, or as employer and employee. In the last case, whoever is the employer can employ the other by the piece, by the hour, or in some other way.

Suppose the operations of the first person are routine. Measuring his productive effort then is relatively easy; for instance, a small sample of the person's effort or output yields a great deal of information on his performance. The operations of the second person are more difficult to evaluate. The outcome of this person's endeavors depends on such factors as whether or not bargain prices for purchased inputs are available, how much the actual quality of the delivered inputs differs from their expected quality, and which deals can be made concerning the sale of the output. Because of the variability in these factors, it is costly to separate, in any particular instance, the effect of luck from that of the level of effort.

If the two persons trade with each other by operating as independent firms, the business expert, when not monitored, may be able to charge input prices that are too high and to pay prices that are too low when buying output. Competition will eliminate any excess profits from such trades, but elimination of the undesirable, resource-consuming practices will be costly. If sharing is adopted as the method of reward for the cooperators, then again the business expert, whose action is difficult to monitor, will be able to gain from what is viewed here as 'shirking'; he may reduce his effort level and disguise the reduction as bad luck.

Consider the case in which the business expert is the entrepreneur, employing the other person by the hour. Since the productive effort of the properly supervised employee is easy to evaluate and is a good measure of his output, he will receive pay corresponding closely to his contribution to output. The entrepreneur's income, which is the residual, depends both on chance and on his own effort. Since his ability to affect his expected income is a function of his contribution only, his incentive for shirking disappears and it does not matter that the chance component is difficult to isolate.

The price of the service or commodity the transactors produce also must be set. The determination of prices, particularly on a continuing basis, is costly and subject to error. By paying an employee a constant wage rather than the value of his marginal product, the entrepreneur assumes the effect of price-variability of output and becomes the residual claimant in this regard, too.

When the entrepreneur bears the risk of the business he is running, he also bears the full consequence of any reduction in his own effort. Bearing the risk here is an act that promotes efficiency, though not necessarily an act of insurance. Collaboration in the form of employer-employee is not always the least costly arrangement, and no attempt is made here to determine when this form is least costly; I simply concentrate mostly on cases where it is. I hypothesize that the remuneration of the entrepreneur takes the form of a residual because his contribution to output and to its value are difficult to measure.¹ More generally, I hypothesize that among factors contributing to the value of common effort, the greater the difficulty in measuring one factor's contribution vis-à-vis that of others, the more likely is the owner of that factor to assume the position of the residual claimant.²

Turning specifically to the employer-employee collaboration, I wish to determine who assumes which role. Both the variability in the physical units and that in their values contribute to the variability in the value of the collaborative outcome. Economists encounter difficulties in detecting variability in physical units; changes in unit value are easier to observe, and are used here to derive a major implication: Changes in relative wages are expected to lead to changes in organization. When two workers, A and B, intend to collaborate, as the market wage of A relative to that of B rises, A tends to assume the employer's role and B the role of employee. A decline in the relative wage of A has the opposite effect. This hypothesis clearly depends on transaction costs, but the test of the hypothesis does not require observations of these costs. The data required to test the prediction are the market wages of two classes of workers and information about whether each individual worker is employer or employee; these are readily observable data.

The prediction that an increase in a worker's market wage will tend to make him the employer is derived from a two person, employer-employee model, the central feature of which is the cost of supervision. Simplifying assumptions serve to isolate the process of determining which of the two will be employer and which employee. The assumptions are as follows.

I. Individuals' working time is the only input, and the total hours of each worker are fixed.³

1. Akerlof [1970, 496] comes close to defining the entrepreneur as a guarantor of quality when quality is subject to manipulation. He says, "... the important skill of the merchant is identifying the quality of merchandise . . . and guarantee[ing] the quality And this is one [added] reason why the merchants may logically become the first entrepreneurs."

2. Grossman and Hart [1986] consider a problem that shares some important features with mine and demonstrate a result similar to the one that underlies my hypothesis.

3. The central question here is how role switching by itself affects total output. The assumption

- II. The entrepreneur's time is divided between direct production and supervision, and his direct contribution to output is proportionate to the amount of time he spends on his productive task (which equals his total time on the job less that spent on supervising).⁴
- III. The employed worker's physical output increases with the amount of time his employer spends on supervising him, but at a declining rate.⁵ The declining rate follows from the assumption of variability: no task is truly routine; some aspects of performance therefore are easier to monitor than others.
- IV. The per hour output of a person working as his own boss exceeds his output as a supervised employee; in other words, some shirking is inevitable when persons are employees rather than their own bosses.
- V. The value of total output is the simple sum of the values of the contributions of the two collaborators.⁶
- VI. Finally, the value of the output of each worker is equal to his contribution to output times his exogenously determined wage rate. This is the conventional relationship between physical output and its value.

In order to determine the employer-employee relationship that maximizes the joint wealth of the collaboration, the maximum outputs of the two possible situations must be compared. At either maximum-output point the increase in the value of the employee's output induced by added supervision must equal the loss in the value of output induced by diverting the entrepreneur's time from production to supervision. A diagrammatic description of the model is contained in the next three paragraphs and in Figures 1 and 2.

Figure 1 serves to determine the supervision level that maximizes the output-value for a particular employer-employee relationship. The horizontal axis in Figure 1 measures the daily hours spent on supervision by the employer, and the vertical axis measures the value of daily output. Supposing that A is the employer and B the employee, $O^s(A)$, is A 's direct output, which falls linearly with the hours he spends on supervising B ; $O_s(B)$ is B 's output as a function of that supervision. S denotes supervision when used as a superscript, supervised when used as a subscript. At low supervision levels, the cost of supervision, which equals the rate of fall in $O^s(A)$, is less than the increase in output it induces; but eventually, due to diminishing returns to supervision, $O_s(B)$ rises more slowly than $O^s(A)$ falls. H_0 is the point where $O_s(B)$ rises at

of fixed hours merely isolates this effect. Relaxing this simplifying assumption, as well as the assumption that time is the only input, does not affect the main conclusion.

4. My characterization of the entrepreneur is similar to Oi's [1983]. Oi concentrates, however, not on who will be entrepreneur, but on the quality of the other inputs the entrepreneur will employ.

5. The worker's valuation of less strenuous effort is incorporated into the value of output. The entrepreneur's desired pace of work underlies his $O^s(A)$ in Figure 1 below.

6. This assumption means that differences in input ratios associated with the change in the employment relationship are abstracted from. It is suggested below that some activities may be switched from one worker to the other, making it easier to obtain the desired input mix.

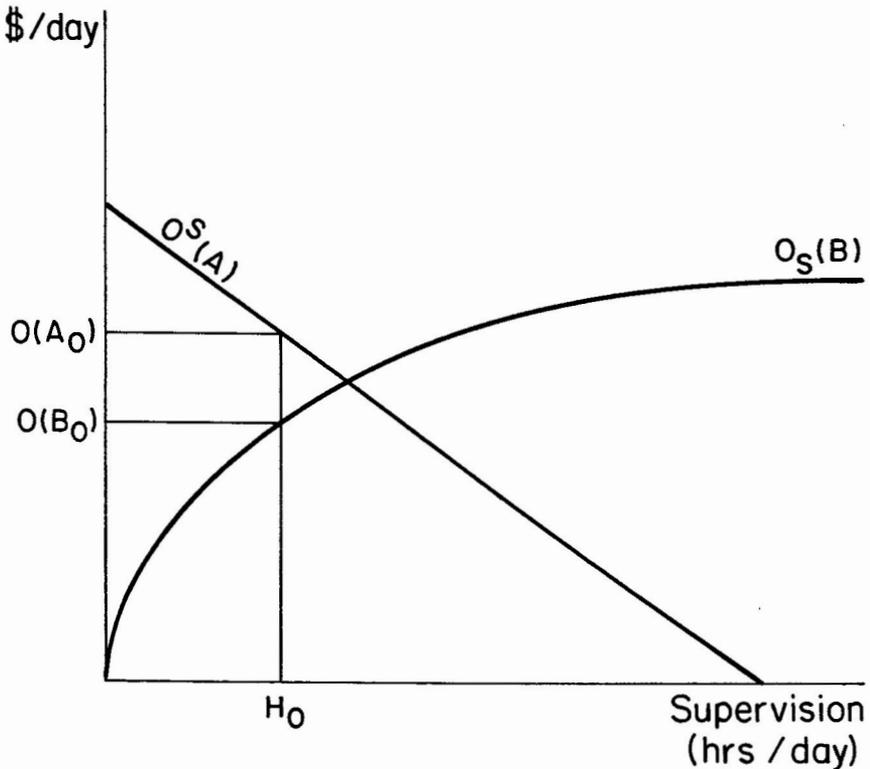


FIGURE 1

the same rate that $O^s(A)$ falls; therefore, at H_0 the sum of $O^s(A)$ and $O_s(B)$ is highest. The value of total output, then, is maximized when the employer devotes H_0 hours to supervision. At the maximum point A spends H_0 hours on supervision and produces $O(A_0)$ output with the rest of his time; B produces $O(B_0)$ output.

Figure 2, an elaboration of Figure 1, allows for the possibility that B will be employer and A employee. For ease of comparison, the value of B 's direct output when operating as employer, $O^s(B)$, is first set to be the same as $O^s(A)$. Suppose also that A , as a supervised employee, is less productive than B , so that $O_s(A)$ lies below $O_s(B)$ as drawn.⁷ With B being the employer and A the employee, H_1 is the maximizing supervision level. As drawn, however, total output is higher if A is the employer and B the employee.

An exogenous increase in B 's wage will shift both his $O_s(B)$ and his $O^s(B)$ proportionately upwards. The maximizing levels of supervision will change; the direction of the change, however, depends on whether B supervises or is

7. A person's productivity as an employee depends on the ease of monitoring his task and on the complementarity between the other's task and monitoring.

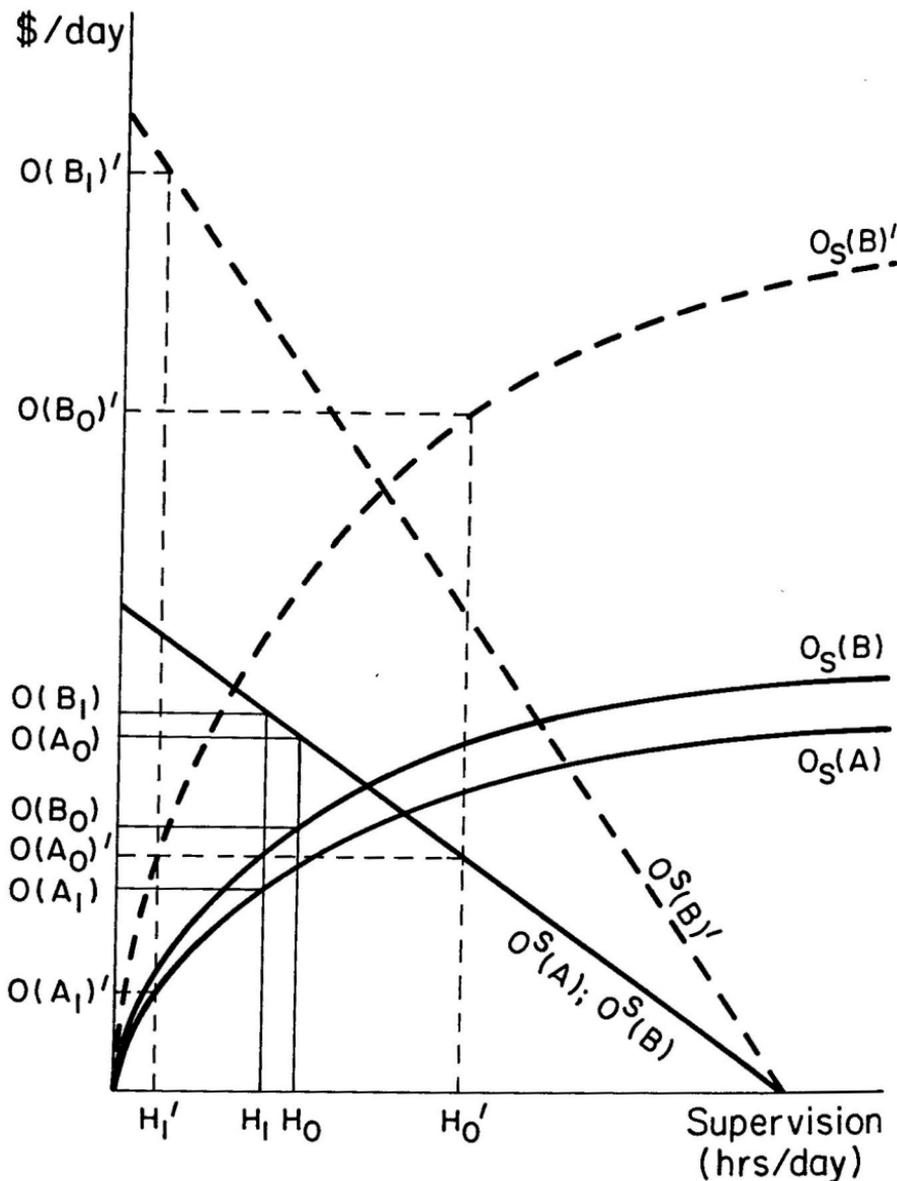


FIGURE 2

being supervised. If A is the supervisor, the value of his supervision and with it its maximizing level will increase. If B is the supervisor, the cost of supervision will increase, and the maximizing level of supervising A will fall.

It will now be shown that as the exogenously determined wage of B relative to that of A rises, the two eventually switch roles, B becoming the employer and A the employee. Consider an exogenous doubling of B's wage. Both of

B 's curves shift upward by a factor of two; $O^s(B)$ to $O^s(B)'$, and $O_s(B)$ to $O_s(B)'$. If A remains the employer, the maximizing level of supervision increases from H_0 to H_0' , and the total value of output is $O(A_0)' + O(B_0)'$. If, on the other hand, B becomes employer, H_1' is the maximizing supervision level and output is $O(A_1)' + O(B_1)'$. As drawn, output is now higher when B is the employer. The reversal in the employer-employee relationships is not accidental. Shirking on the part of the employee is, as asserted, unavoidable even if the employer devotes all his time to supervision. A person's output as even an intensively supervised employee would be less than when, as his own boss, he is devoting all his time to production (and none to supervision). As the exogenous wage rate of that person increases, the difference in output value between his working as his own boss and as a supervised employee increases proportionately, whereas the loss from not supervising the worker whose wage is held constant will not exceed the maximum that worker can produce, which is a fixed amount. Thus eventually the former must swamp the latter.

The reduction in the net cost of shirking that is effected by switching roles may be enhanced if the two workers also swap some activities. Activities that are neither difficult to monitor nor highly specialized are expected to revert to whoever is the employee. Activities that are difficult to monitor, such as transacting with "outsiders," are expected to be assumed by whoever is the employer. When such changes are available, the employer's output as a function of the amount of supervision will also become concave. The inference that an exogenous increase in the wages of one worker will induce him eventually to become the employer, however, remains.

If an exogenous increase in a worker's wage enhances the chance that he will become an entrepreneur, then it is expected that entrepreneurs will more often than not earn more than their employees. Verification of this prediction is problematic. The entrepreneur's remuneration, of course, is subject to competition. The nature of the competition for the entrepreneurs' rewards cannot be determined, however, since these rewards are not in the form of observable market prices. The difficulty in measuring the entrepreneur's contribution explains why his reward takes a residual form.

The hypothesis that an exogenous increase in a worker's wage makes it more likely that he will become employer of another with whom he collaborates can be empirically tested. The hypothesis can be tested directly, for example, in relation to ditch digging, an activity often performed by two workers where one operates a bulldozer and one drives a truck. When the collaboration of bulldozer operator and truck driver takes the form of an employer-employee relationship, the prediction is that as the exogenously determined wage of truck drivers increases relative to that of bulldozer operators, the proportion of truck drivers who are employers also increases.

Additional tests of the hypothesis may be performed provided the model is somewhat generalized. In the model, the pay of an employed worker and of an entrepreneur may be thought of as being obtained from a formula

consisting of the combination of a fixed wage and of a residual, with, in this case, the appropriate zero-one weights. In the more general case, non-zero weights apply so that part of a worker's pay is a wage and part is a share of the residual. The greater is the weight of the residual in total expected pay, the closer is the position the worker assumes to that of entrepreneur. This extension of the model yields the prediction that as a worker's productive capacity, and with it market wage, increase, the weight of the residual component in total pay becomes higher.

This prediction may be tested by observing the form of pay in some partnerships and in some professional sports. In such partnerships as those of lawyers or of physicians, the partners' pay formula often consists of a salary plus a measure of each partner's contribution to the partnership income. The prediction is that as partners' total income increases, whether because their exogenous market wage rises, or because they gain experience, the fraction contributed by the fixed salary will decline. A closely related prediction applies to professional team athletes. The higher are athletes' incomes, the greater the share of remuneration based on variables such as gate receipts or attendance is expected to be.

Another implication arises in regard to the division formula of court-awarded rewards between client and lawyer. Clients' role differ greatly depending on the nature of their claims. For instance, a driver claiming collision damages incurred when he drove his car is likely to play a greater role in the ensuing litigation than is one claiming damages to his unoccupied automobile that was hit by another car. The greater the personal role of the plaintiff, the more his reward is expected to be in the form of a residual and that of his attorney is in the form of a fixed fee; conversely, the smaller the role of the plaintiff, the more likely is the lawyer fee to take the form of a share in the total.⁸

III. RISK AND THE COST OF TRANSACTION APPROACH TO CONTRACTS

The term "moral hazard" originated as an insurance term and continues to be used as such, but it clearly has a broader range of application. Units of a commodity that vary in value will be sold at a uniform price if the gain of selling them at different prices is less than the cost. Non-identical workers exerting non-identical efforts, for instance, are sometimes equally paid. Whenever such smoothing out is practiced, people are not marginally penalized for certain types of careless or poor behavior and can be expected to exploit the smoothing out for their own gains; thus, workers "shirk," and patrons of a single price movie theater wait in line to gain the better seats. These practices are logically equivalent to moral hazard in insurance. This view of the moral hazard problem renews the role of risk in explaining economic organization

8. In Canada and the U.K., where contingent fees are prohibited, clients are the court-awards residual claimants in all cases. When seeking court awards, clients are expected to get more involved in the litigation than are their American counterparts.

and provides a link between the risk explanation and the transaction cost approach to contracts.⁹

The unification of risk and transaction cost leaves behind one casualty, namely, risk aversion as a necessary condition for explaining the employer-employee relationship. Risk aversion is often considered the reason for fixed wage contracts. The person who is less risk averse is thought to assume the bulk of the risk of the joint action by employing others for a fixed wage and by absorbing some of the effect of wage fluctuations. I offer an alternative explanation: The person with the greater ability to affect outcome variability will employ the other for a fixed wage. How can the two explanations be distinguished from each other?

Compare the layoff rate of employees whose wages (and hours) are fixed with the unemployment rate of the self-employed. When the price of a product falls because of a fall in demand, an employer who continues to use labor at the original fixed wage will experience a fall in profits. A common reaction of employers is to lay workers off. Expectation of a layoff, however, produces greater income variability and lower income than expectation of a wage reduction produces, and a risk averse person prefers lower-wage employment to unemployment. A risk averse person values the constancy of income; a fixed wage contract that permits layoffs, however, does not produce constant income. The employer also experiences lower income and greater variability with layoffs than with wage reductions. If risk aversion were the sole reason for the form of wage payment, a contract providing for wage reductions with a fall in demand would be preferred to a fixed wage contract accompanied by layoffs. Thus, no difference in the rate of employment between individuals who are self-employed and those who are employed by others would be expected.

The transaction cost hypothesis implies that the fixed wage is designed to prevent the employer from "unjustifiably" reducing wages. The employer, presumably, is more knowledgeable than the employee regarding conditions in the industry. When wages are allowed to adjust constantly to market conditions, the employer is in a position of lowering wages even when true conditions do not merit the action. If, however, he is committed either to keeping his workers employed at the agreed upon wage, or, as elaborated below, to laying them off along with his own resources, he will lay them off only when conditions turn unusually bad.¹⁰ Were the person self-employed, he would have the choice of responding to a fall in demand either by not

9. For a demonstration of some of the organizational implications of moral hazard, see my 1982 paper.

10. The moral hazard explanation of layoffs is given by Hashimoto [1979] and by Hall and Lilien [1979]. In his long term contract with employees, the employer must also agree (perhaps implicitly) not to hire other workers at the lower "spot" wage rates prevailing when layoffs are called for. When demand conditions facing a whole industry deteriorate, many firms may lay off workers and not lower wages even though the laid off workers might be willing to work at lower wages.

working or by working at a lower rate of remuneration and presumably he would choose to work in times when employed workers are laid off.

A comparable fall in the prices of products produced by employees and by self-employed workers is expected to lead to a higher rate of unemployment for the former than for the latter when moral hazard rather than risk aversion is the reason for the fixed wage contract. If such a differential is observed, the risk aversion theory tends to be rejected, whereas the moral hazard one is supported. Thus, a test is available to distinguish between the two explanations of the fixed wage contract.

Some barbershops are operated and owned by one barber; other shops are owned by one barber who employs several others. By my model, a fall in demand for haircuts will lead to a layoff rate among the employed barbers that is higher than the rate of closures of shops owned by self-employed ones. In a similar situation, a fall in the demand for taxicabs is expected to induce a greater layoff rate for employed drivers and the cabs they operate than for owner-operators and their cabs.

IV. THE ROLE OF THE ENTREPRENEUR'S OWN CAPITAL

An explanation is now offered for the observation that the entrepreneur usually supplies capital of his own to the enterprise, first in relation to other sources of finance, and second in relation to the employment of labor. Consider a businessman who discovers that the landed price of an imported good is expected to be lower than the local price. Price fluctuations, changes in shipping costs, and spoilage all introduce variability to the expected return. The businessman can raise capital to finance the project by selling bonds or by floating stock. Suppose that it is known to all that the variability of the venture depends entirely on forces beyond the businessman's control. In that case, the businessman's net pecuniary income from these alternative forms of finance will vary only to the extent that he earns more or less of a premium for bearing risk. Indeed, the businessman could easily become the capitalists' employee without affecting the basic results.

In terms of what Lucas [1981] describes as the "*relationship* between decision maker and observer," the businessman here is the decision maker, and the lenders are the observers.¹¹ These observers have no difficulty in detecting what the decision maker is doing; thus, they recognize the risk they assume when they participate in the venture. Subsequent to the discovery of the opportunity, the role of the decision maker in this extremely simplistic situation is trivial. His actions are routine and he introduces no uncertainty to the picture. The risk such a businessman faces, then, can be readily transacted in the market.

In contrast, consider the same person's search for the profitable venture. That search requires the businessman's time, which he may finance himself,

11. Lucas [1981, 236, italics in the original]. See also page 223. I am indebted to Lucas for illuminating this point in a private correspondence.

or for which he may seek outside financing. The expected return and the variability of the return of this investment depend on the businessman's diligence. How can the project be financed if it is costly to monitor both the businessman's effort and his ability to effect a tradeoff of a lower expected overall return for exceptionally high returns at lower probabilities? The cost of monitoring the businessman's effort may be so high that other people may refrain from buying shares in the project. They may be willing, however, to lend him money at a fixed rate which, as compensation for their expectation of default, sufficiently exceeds the market rate of interest. If the risk of default were constant, the businessman would bear the entire expected effect of the project's outcome variability. By the previous assumptions, however, the businessman's ability to affect the probability distribution of outcomes is costly to detect and the default probability cannot be considered constant. Under the stated conditions, as long as the businessman does not finance the whole project, no contract realizing the entire joint gain can be obtained.¹²

Lenders who forward loans to a businessman at a fixed rate fully share losses since the value of the loan can fall to zero, but they do not share gains, since the loan value does not rise with the project's success. The businessman, therefore, can be expected to search for riskier projects at the expense of a lower expected joint rate of return. The expected joint return from the project will be highest, then, with self-financing, and will decline as the share of external financing increases. Lenders may impose constraints on borrowers and warrants may be used. These methods, however, are costly, and even when they are used the joint return will decline with the share of self-financing. Since, on average, outside creditors earn the market rate of return, a fall in the return from such projects must ultimately be borne by the businessman.¹³

The change in the businessman's behavior in response to the extent and method of external financing implies that the expected return to the project is itself not a parameter but rather an endogenous variable. The return, then, is subject to "uncertainty." In this situation, it is costly for the observers to isolate the effect of a change in the decision-maker's behavior from the effect of the random factor. This costliness in turn makes it difficult for the decision-maker to induce others to collaborate with him, as the mere act of collaboration implies a fall in the venture's expected return. The smaller is the businessman's contribution to financing, the lower the expected return to the project.

In this stylized operation, the businessman's effort in search of profitable

12. Jensen and Meckling discuss essentially the same problem and arrive at similar conclusions.

13. The notion is common that in corporations, ownership and control are separate and managers are able to gain at owners' expense. The apparent managers' gain, however, must be consistent with owners, in the aggregate, earning the market rate of interest. Managers' apparent ability to gain at owners' expense, then, actually must reduce the demand for managers' services and, if supply of managers' services is not perfectly elastic, managers' income is expected to be lower than it would be were such opportunities absent.

opportunities is difficult to observe and thus financing it is problematic. On the other hand, at the stage when the discovered opportunity is acted upon, the businessman's effort is easy to monitor and is thus easy to finance. Self-financing, then, may give way to market financing at a juncture where measuring the product becomes easier.

Self-financing performs one more function which may explain why usually capital hires labor. A person who employs a factor on a continuing basis at a fixed pay schedule must be able to convince the factor's owner that payment will be forthcoming. The value of the contribution of an employee working for fixed pay or of a fixed rate lessor of capital equipment varies over time. Therefore, about half the time their contributions will exceed their pay, and half the time the reverse will be true. Owners of such factors may fear, then, that pay will be forthcoming only so long as business conditions are good and the value of their contributions exceeds their rate of pay, since whenever their pay rates exceed the value of their contributions, their employer gains if he replaces them with inputs obtained in the "spot" market. Employed factors will feel more secure if their contracts are structured so that an employer who fails to pay for the use of others' assets stands to lose, which will happen, for instance, if a commensurate amount of the employer's own capital is idled when he lays off other factors. The person assuming the bulk of the risk, then, is also expected to bring in his own capital, committing to idle it when his hired factors are let go. He thus secures his commitment to his employed resources for the new risk he may impose on them.¹⁴ This may explain why in recessions both labor and capital are held idle.

When the businessman takes responsibility for his own action through self-financing, the net return from the project will be higher than when others provide part of the financing. A businessman whose personal wealth is inadequate for financing a particular prospective venture may be unable to develop it, whereas another who can finance his own effort may earn a handsome return from developing the same venture.

V. CONCLUSIONS

In this paper I argue that the entrepreneur assumes the role of residual claimant because his actions are more costly to monitor than those of the factors he collaborates with. There is little conflict between this view and the more common image of entrepreneurs as enterprising capitalists. The present approach is consistent with the views of both Knight [1921]¹⁵ and Coase [1937]¹⁶ on the firm as well as with a branch of the transaction cost literature, the

14. The explanation offered in the text, anticipated by FitzRoy and Mueller [1984], may be an answer to the puzzle posed by Putterman [1984].

15. In my companion paper in this issue I attempt to show that Knight developed (but then abandoned) such a theory.

16. If one follows Coase [1937] in defining the firm in terms of "master and servant," then this hypothesis constitutes a component of the theory of the firm.

principal contributors to which are McManus [1975] and Jensen and Meckling [1976]. The entrepreneur's newer role as monitor proposed by Alchian and Demsetz [1972] is viewed here as derived rather than as primary. Neither is the entrepreneur, as proposed in the principal-agent literature, necessarily less risk averse than are those with whom he collaborates. Instead, by becoming entrepreneur the more difficult task of having others monitor him is avoided. Moreover, as was seen above, my entrepreneur can be identified empirically. Skills in monitoring and taste for risk are, on the other hand, not readily observable.

Quite often the entrepreneur is characterized as a capitalist or as the discoverer of non-routine trading opportunities. Kirzner [1973], for instance, views the entrepreneur as the person who effects the economy's move towards equilibrium by discovering, and profiting from, opportunities for arbitrage across markets. He argues that the entrepreneur needs no productive resources for his operation, but must only be alert to exploit price differentials. Buchanan [1980] takes a broader view, emphasizing the more dynamic Schumpeterian role of the entrepreneur who uses capital to take advantage of profit opportunities across time periods. These views and mine are in harmony as far as such activities are most difficult to monitor; however, these authors abstract from and, in Kirzner's case, even deny the entrepreneur's organizational role hypothesized in this essay.

I have considered situations where discovered profit opportunities require collaboration among factor owners. I have argued that the (would-be) entrepreneur supplies the factor performing the least routine role since his effort is more costly to measure and to monitor than that of others. In order to reduce the opportunity for moral hazard the entrepreneur becomes the residual claimant and employs the other factors at some fixed terms. Moreover, because new opportunities for morally hazardous behavior are created by the fixed pay contracts, the entrepreneur's own capital serves as his bond; consequently, he is expected to be a capitalist, too.

The basic argument of this paper can be recast in terms of information costs.¹⁷ The variability among units of a commodity or a service being exchanged at a fixed price reflects the costliness of acquiring relevant information. The exchange party whose cost of acquiring the information is lower than the other's also has greater control over variability. Information here is asymmetrical, and it may appear that the uninformed party can be exploited. The incentive for exploitation vanishes, however, if the informed party assumes the effect of variability by becoming employer-entrepreneur. The uninformed exchange parties, through their fixed pay contracts, are guaranteed by the informed ones that they will not be taken advantage of, so they have no incentive to collect the information. At the same time, the entrepreneur's

17. Hayek [1937] opened the discussion on what is the minimum information necessary to make the right decision.

wealth is maximized when he collects that information which is jointly maximizing.¹⁸

REFERENCES

- Akerlof, George A. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *Quarterly Journal of Economics*, December 1970, 488-500.
- Alchian, Armen A. and Harold Demsetz. "Production, Information Costs, and Economic Organization." *American Economic Review*, December 1972, 777-95.
- Barzel, Yoram. "Measurement Cost and the Organization of Markets." *Journal of Law and Economics*, April 1982, 27-48.
- . "Knight's 'Moral Hazard' Theory of Organization." *Economic Inquiry*, January 1986, 117-20.
- Buchanan, James M. "Resource Allocation and Entrepreneurship." *Statsvetenskaplig Tidskrift (The Swedish Journal of Political Science)* 5, 1980, 285-92.
- Cheung, Steven N. S. "The Contractual Nature of the Firm." *Journal of Law and Economics*, April 1983, 1-22.
- Coase, Ronald H. "The Nature of the Firm." *Economica*, November 1937, 386-405.
- FitzRoy, Felix R. and Dennis C. Mueller. "Cooperation and Conflict in Contractual Organization." *Quarterly Review of Economics and Business*, Winter 1984, 24-49.
- Grossman, Sanford J. and Oliver Hart. "The Costs and Benefits of Ownership: A Theory of Vertical Integration." *Journal of Political Economy*, August 1986, 691-719.
- Hall, Robert E. and P. M. Lilien. "Efficient Wage Bargains Under Uncertain Supply and Demand." *American Economic Review*, December 1979, 868-79.
- Hashimoto, Masanori. "Bonus Payments, On-The-Job Training and Lifetime Employment in Japan." *Journal of Political Economy*, October 1979, 1086-104.
- Hayek, Friedrich A. "Economics and Knowledge." *Economica* (New Ser.), February 1937, 33-54, reprinted in Friedrich A. Hayek. *Individualism and Economic Order*. Chicago: University of Chicago Press, 1948, 33-56.
- Jensen, Michael C. and William H. Meckling. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics*, October 1976, 305-60.
- Kirzner, Israel. *Competition and Entrepreneurship*. Chicago: University of Chicago Press, 1973.
- Knight, Frank H. *Risk, Uncertainty and Profit*. Boston: Houghton-Mifflin, 1921.
- Lucas, Robert E., Jr. *Studies in Business-Cycle Theory*. Cambridge: MIT Press, 1981.
- McManus, John C. "The Costs of Alternative Economic Organizations." *Canadian Journal of Economics*, August 1975, 334-50.
- Oi, Walter Y. "Heterogeneous Firms and the Organization of Production." *Economic Inquiry*, April 1983, 147-71.
- Putterman, Louis. "On Some Recent Explanations of Why Capital Hires Labor." *Economic Inquiry*, April 1984, 171-87.

18. The argument can also be rephrased in terms of property rights. My basic proposition implies that only if the party able to affect variability in a transaction also assumes its effect are property rights well defined, and then no resources will be spent to capture wealth. These are also the circumstances under which resources are used most productively. The cost of transacting matters here, and thus the Coase Theorem is not applicable. When variability is allocated efficiently, however, property rights are well defined, and, as implied by Coase, output is then at its maximum.