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Economic Returns to Entrepreneurial Behavior

R. Brent Ross and Randall E. Westgren

Highly turbulent environments require firms to act entrepreneurially. The returns to entrepreneurial activities are known as entrepreneurial rents. Following the payments perspective, these rents are allocated to the entrepreneurial resources of the firm as factor payments. However, unlike other factor payments, little is known about how to value these types of rents. An analysis of the economics and management literature reveals that entrepreneurial rents are a return to alertness, subjective judgment, asset control, and uncertainty bearing. Furthermore, entrepreneurial rents are noncontractible and temporary. This paper introduces two complementary valuation models that capture these characteristics and that explicitly impute value to various entrepreneurial activities.

Key Words: entrepreneurship, factor payments, subjective judgment, uncertainty

JEL Classifications: M13, B12, B25, P23, Q13

A new competitive landscape has been identified in the management literature (Hitt et al. 2002b; McGrath and MacMillan; Pascale, Millemann, and Gioja). This landscape is characterized by rapid change, an ultracompetitive environment, and high uncertainty and requires a different management paradigm from the traditional “analytical” strategic management model (D’Aveni). To be successful, firms must constantly renew and redeploy the sources of their competitive advantage and realize (i.e., discover and execute) new profit opportunities. Models of entrepreneurship are a sound foundation for this new characterization of strategic management.

The term “entrepreneur” was introduced to economics by Richard Cantillon in 1755 (Brewer; Herbert and Link; Hoselitz; Speng-

ler). Since then, entrepreneurship and its central figure, the entrepreneur, have been the focus of numerous studies, including historical foundations (Herbert and Link; Hoselitz; Loasby; Spengler), the qualities of entrepreneurial behavior (Bird), the sociological and organizational dynamics of entrepreneurship (Eisenhardt and Schoonhoven; Etzioni; Schoonhoven and Romanelli; Thornton and Ventresca), and corporate entrepreneurship (Morris and Kuratko).

Recently, a new stream of literature has formed around strategic entrepreneurship (Hitt et al. 2002a; Meyer and Heppard). This new area of research is different from what has been traditionally identified as strategic management research. Instead of focusing on the mechanisms that can be used to sustain competitive advantage (i.e., existing market position), strategic entrepreneurship is about recognizing and taking advantage of new profit opportunities (Michael, Storey, and Thomas).

A firm that manages for strategic flexibility and constant renewal is able to generate

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above-average profits and thus is rewarded for its entrepreneurial behavior. The return to entrepreneurial behavior is entrepreneurial rent. Unlike most factor costs, entrepreneurial rents are noncontractible *ex ante* by either the entrepreneur or the firm. This is because the entrepreneur exercises judgments to allocate resources in an uncertain environment (Knight 1921). Because the judgments are framed in an uncertain environment, the judgments themselves are uncertain and are thus *ex ante* noncontractible.

This paper examines the different views of entrepreneurial activities in the literature and the nature of payments received for these activities. Because entrepreneurship is not as homogeneous as other factors, the analysis of payments to entrepreneurial behavior is complex. The aim of this paper is to explicitly include entrepreneurship in a model of the firm while reducing this dimensionality to two categories of activities: arbitrage and innovation. We highlight what the entrepreneur receives for these activities and what governs their imputation from the stream of profits.

The first section of this paper reviews the several definitions of entrepreneurial rent from the economics and management literature. An analysis of these definitions is undertaken to identify the core attributes, capabilities, and activities that lead to entrepreneurial rents. The third section synthesizes the various models of entrepreneurship into a dynamic model of entrepreneurial rents, which comprises the entrepreneurial activities and capabilities and the payments that they receive. In this way, the rents to innovation and arbitrage are made explicit and distinct from the contractible payments for factors of production. Following this model, entrepreneurial rents are then empirically calculated for a three-site hog production farm. A system dynamics model is used to capture the effects of various entrepreneurial activities on the hog production system and to calculate the resulting rents to the entrepreneurial activities. The final section summarizes the results and discusses implications for present and future research.

To focus the analysis, a few assumptions are made. An entrepreneur is the decision-

making resource in a firm, and a firm that actively searches for new profit opportunities is an entrepreneurial firm. Thus, we are not limited to a definition of entrepreneurship as the "single-mind" or "inventor" archetype. As Casson (1995) points out, an entrepreneur must establish a firm to exploit his or her entrepreneurial behavior in the pursuit of profit; the firm must exist to appropriate entrepreneurial rents. Furthermore, using Lippman and Rumelt's (2003b) terminology, we reserve the term "entrepreneurial rent" to represent the firm's factor payment to entrepreneurial behavior. This payment is positive when profits occur and is negative when losses occur.

Entrepreneurial Rent

Firm resources¹ can generate a variety of different types of rents. Traditionally, economists have focused on two types: one generated by the scarcity of the resource (Ricardian rents), the other by optimal allocation of that resource to its first best use (Paretian or quasi rents). We show below that the rents accruing to the entrepreneurial resource do not fit neatly into these two categories.

Entrepreneurial rent is often neglected in the literature. This is unfortunate because entrepreneurial rents represent a potentially significant source of value for the firm. To better understand these rents, the following section provides a resumé of the more than 200 years of thought about entrepreneurial activities and behaviors. In doing so, we focus on how value is created by entrepreneurial production and exchange activities and how it is captured as a payment to one or more entrepreneurial resources.

At first glance, these writings appear to contain many seemingly incommensurable definitions of entrepreneurial rents. However, a careful synthesis of this literature quickly reveals some defining characteristics about entrepreneurial rents.

¹ All assets (physical, intangible, financial) and all human resources (skills and capabilities) are referred to as "resources," following convention from the strategic management literature.

Cantillon (Rents from Uncertainty Bearing)

The central figure in Cantillon's analysis was the contractor who bid on contracts from the crown. In his analysis, Cantillon described a contractor who set a price at which he was willing to offer his services to complete a task. If accepted, the contractor then incurred *ex ante* uncertain costs associated with fulfilling the contract. The difference between the bid price and production costs was the return the contractor received for services; Cantillon considered this return entrepreneurial rent.

For Cantillon, entrepreneurs were willing to buy at a certain price and sell at an uncertain price, or vice versa. Interestingly, he singles out farmers as a particular type of "undertaker" (the 18th century Anglicism for the French term entrepreneur) whose certainty might be limited to the price of land.

The farmer is an undertaker who promises to pay to the landowner, for his farm or land, a fixed sum of money (generally supposed to be equal in value to the third of the produce) without assurance of the profit he will derive from this enterprise. He employs part of the land to feed flocks, produce corn, wine, hay, etc. according to his judgment without being able to foresee which of these will pay best. The price of these products will depend partly on the weather, partly on the demand; if corn is abundant relatively to consumption it will be dirt cheap, if there is scarcity it will be dear. Who can foresee the increase or reduction of expense which may come about in the families? And yet the price of the farmer's produce depends naturally upon these unforeseen circumstances, and consequently he conducts the enterprise of his farm at an uncertainty. (Cantillon, p. 10)

The difference between the certain prices paid and the uncertain prices received was said to constitute an entrepreneurial profit or loss. Thus, in the Cantillonian tradition, entrepreneurial rent can best be described as the return to uncertainty bearing.

Von Thünen

Von Thünen's formulation of entrepreneurial rent is similar to that of Cantillon. However, in his definition of entrepreneurial rents, he includes a return to judgment. He also introduces the possibility of incorporating insurance to mitigate some uncertainties.

If from the profit which the entrepreneur of a business gets you deduct (1) the interest on the invested capital; (2) the insurance premium against shipwreck, fire, hailstones, and so forth; and (3) the salary of manager-employee, clerks, and so forth who would conduct the business and do the work of supervision, there remains as a rule for the entrepreneur a surplus, and this is entrepreneurial gain. (Von Thünen, p. 246)

Because "there exists no insurance company that will cover all and every risk connected with a business" (Von Thünen, p. 246), the residual income appropriated to the entrepreneur is a payment for the greater level of effort that the entrepreneur must exert when 'risking it all.'

The entrepreneur working on his own account and at his own risk will, other things being equal, apply greater effort, and this is the reason why the entrepreneur, in addition to the cost of administration, gets something else which we call compensation for industry. (Von Thünen, p. 248)

This is the first treatment of entrepreneurial rents that considers administration (or management) as a distinct activity from uncertainty bearing. Von Thünen also explicitly distinguishes among wages, managerial salaries, interest on capital, and insurable risk—all contractible costs, and costs that are noninsurable because of uncertainty.

Knight (Rents from Judgment)

Under the Knightian view of entrepreneurial rents, entrepreneurs receive the residual income of the profits generated by their actions after all costs (i.e., wages, utilities, etc.) have been borne by the firm. Entrepreneurs gener-

ate profits by their actions in deploying resources to optimal effect in an uncertain environment (Glauncey and McQuaid). Thus, the residual (noncontractible) income received by the entrepreneur is seen to be a return to risk bearing and judgment or foresight. Because entrepreneurs make unique judgments, Knight's definition also entails a sense of monopoly or Ricardian scarcity.

[The entrepreneur's] first and primary function . . . is that of leadership or economic pioneering; it is to initiate useful changes or innovations. The incentive to new departures is profit. . . ; it is a temporary gain, of the nature of monopoly revenue, beyond the value of resources in other uses, during a period while the innovation is being imitated and is spread through the economy as standard practice. (Knight 1942, p. 128)

This use of the word "monopoly" is an extension of Chamberlainian differentiation. That is, at the limit, unique judgment can lead to unique combinations of factors and a unique position in the market: the *sine qua non* of strategic management since 1980.

Schumpeter (Rents from Innovation and Intuition)

In Schumpeter's (1934, 1991) view, an entrepreneurial rent² is the "surplus" that is received by a firm after all costs have been paid. More specifically, a surplus is the difference between the total receipts and outlays³ of the business. To create this surplus, the Schumpeterian entrepreneur introduces new commercial combinations of resources (i.e., innovations) to the market in hopes of creating new consumer preferences and production technologies. This description of the entrepreneurial

rents is the one most often adopted by the resource-based view of the firm (Lewin and Phelan; Mahoney and Pandian).

Schumpeter (1934) identifies 5 general types of commercial combinations. These 5 innovations represent potential sources of entrepreneurial rents and value creation for the firm.

1. The utilization of a new and cheaper source of supply for a means of production.
2. The replacement of one production or consumption good by another, which serves the same or approximately the same purpose but is cheaper.
3. The creation of a new good that more adequately satisfies existing and previously satisfied needs. "In this case, the possibility of profit rests upon the fact that the higher price received for the better commodity surpasses its costs, which are likewise higher in most cases." (Schumpeter 1934, pp. 134–35)
4. The search for new markets in which a product has not yet been introduced and in which it is not produced.
5. The introduction of a completely new product

In addition to suggesting that entrepreneurial rents are generated through the commercial exploitation of innovation, Schumpeter (1934) also points to several other key features of entrepreneurial rents. The first key feature is consistent with Knight's (1921) notion of judgment under uncertainty; however, in Schumpeter's terminology, judgment under uncertainty becomes

. . . intuition, the capacity of seeing things in a way which afterwards proves to be true, even though it cannot be established at the moment, and of grasping the essential fact, discarding the unessential, even though one can give no account of the principles by which this is done. (Schumpeter 1934, p. 85)

This characteristic leaves open the possibility that if an entrepreneur's intuition (judgment) is poor, losses can occur. However, as Schum-

² Schumpeter (1934) uses the term "entrepreneurial profits."

³ Outlays include all the direct and indirect disbursements that an entrepreneur must make to produce a product. These outlays also include an appropriate wage for labor performed by the entrepreneur, an appropriate rent for any land that might belong to the entrepreneur, interest on capital, and a risk premium (Schumpeter 1934).

peter explains, this loss is never incurred by the entrepreneur.

The entrepreneur is never a risk bearer. . . . The one who gives credit comes to grief if the undertaking fails. For although any property possessed by the entrepreneur may be liable, yet such possession of wealth is not essential, even though advantageous. But even if the entrepreneur finances himself out of former profits, or if he contributes the means of production belonging to his 'static' business, the risk falls on him as capitalist or as possessor of goods, not as entrepreneur. Risk taking is in no case an element of the entrepreneurial function. Even though he may risk his reputation, the direct economic responsibility of failure never falls on him. (Schumpeter 1934, p. 137)

The notion that entrepreneurial rents can never be negative is a significant departure from the early writings of Cantillon and Knight, who viewed risk bearing as one of the primary functions of the entrepreneur. It can thus be argued that the Cantillonian and Knightian entrepreneur is also a capital owner in the firm, whereas Schumpeter was explicit about separating out these roles within a firm.

Entrepreneurial rents are also temporary. The pattern of flow of entrepreneurial rents follows the Schumpeterian process of creative destruction. According to this process, entrepreneurs generate profits by first disrupting an equilibrium market by introducing innovations and then commercially exploiting these novel products or production technologies to earn profits. In this way, the Schumpeterian entrepreneur is a disequilibrating agent in an economy. However, as other market participants learn of these innovations, imitation occurs, and profit opportunities are eliminated as equilibrium is restored.

Finally, entrepreneurial rents contain an element of monopoly in that they are derived from unique behavior. "Since the entrepreneur has no competitors when the new products first appear, the determination of their price proceeds wholly, or within certain limits, according to the principles of monopoly price" (Schumpeter 1934, p. 152). This is consistent with Knight's model above. However, unlike

the Knight model, Schumpeter (similar to Von Thünen) is careful in separating capital ownership from entrepreneurial activity. Instead, one could argue that Schumpeter's model of innovation and his belief that corporations will drive structural change only require that the entrepreneur control sufficient capital to fund the innovation. Thus, the corporation becomes the residual claimant to innovation profits.

Schumpeter adds, moreover, "[in] the modern corporation, entrepreneurial gains are as a rule merged with many other elements into the profit item, and the individuals who fill the entrepreneurial function are separated from them—accepting the salaries and other prerequisites of executives in lieu of them" (Schumpeter 1991, p. 417). Thus, the entrepreneur trades residual claim to noncontractible payments for a contractible payment.⁴ The corporation, as "owner" of the entrepreneur's effort earns the uncertain rent stream, which becomes confounded with other payments to ownership.

Kirzner (Rents from Alertness, Information, and Luck)

Kirzner views entrepreneurial rents as the reward for the discovery of "erroneous valuations." In contrast to Schumpeter's argument that entrepreneurial rents are created by intentionally disrupting equilibrium markets, Kirzner's (2000) conceptualization of the role of the entrepreneur relies on the discovery of markets that are already in disequilibrium. In this case, it is the entrepreneurial function of discovering and exploiting market frictions that creates entrepreneurial rents and ultimately drives the market to equilibrium.

⁴ Schumpeter is careful not to term this payment as a wage. "We want to emphasize that profit is also not wages, although the analogy is tempting. It is certainly not a simple residuum; it is the expression of value of what the entrepreneur contributes to production in exactly the same sense that wages are the value expression of what the worker 'produces'. However, while wages are determined according to the marginal productivity of labor . . . what the 'marginal entrepreneur' receives is wholly a matter of indifference for the success of the others. Every rise in wages is diffused over all wages; one who has success as an entrepreneur has it alone at first" (Schumpeter 1934, p.134).

One who has captured profits has acted in accordance with the realities that the market had hitherto failed to recognize. His profit has been won by breaking away from the ignorance that previously prevailed as conventional wisdom. As entrepreneurs attracted by the profits so obtained move to take advantage of their availability, the market in general comes to be pulled and nudged to take proper account of the underlying, and hitherto overlooked, realities. (Kirzner 1979, p. 157)

The key feature of the Kirznerian entrepreneur is that he is alert and perceptive to new information and, thus, new opportunities; this enables him to benefit profitably through the ignorance of others (Kirzner 1979; O'Driscoll and Rizzo; Shane). In this way, Kirzner emphasizes the role of information and knowledge in the entrepreneurial process. The possession of unique information by individuals, therefore, is what allows entrepreneurs to be alert to opportunities and to value goods and services at different prices in the market.

However, it is not merely by deliberate behavior that profits are realized. Kirzner explicitly recognizes the role of "luck" and "surprise" in the entrepreneurial discovery process. According to Kirzner (1979), it is only with luck that an entrepreneur is able to come across the specific piece of information that he requires to trigger his discovery. Because of the uncertain distribution of entrepreneurial opportunities, it would be impossible for the entrepreneur to *ex ante* design a systematic search process to find this same piece of information that triggers the entrepreneurial discovery. Thus, Kirzner (1979) points out the paradox of entrepreneurial rents: The information that triggers entrepreneurial discoveries is not received through any deliberate action of the entrepreneur but instead is the result of luck and surprise. However, the exploitation of this information requires an individual that is alert and perceptive to its value and that acts deliberately.

The Kirznerian tradition recognizes that entrepreneurs engage in arbitrage and generate pure profits through the exploitation of price differentials. This is similar to the view expressed earlier by Cantillon. However, unlike

Cantillon, there is no explicit consideration of the production activity in the Kirznerian world. His returns arise from speculation and arbitrage opportunities, which are necessarily subject to dissipation in the market. Furthermore, Kirzner did not view the return to entrepreneurship as being subject to uncertainty. The market friction either exists or it does not, and the entrepreneur will only exploit the price differential if doing so will result in positive returns. Thus, Kirzner assumed that the entrepreneur acts as if he has full information. Uncertainty only enters the entrepreneurial process with respect to the timing of the discovery of new information.

Casson (Rents from Judgment, Market Making, and Leadership)

Casson follows the tradition of Knight, Schumpeter, and Kirzner in that he views entrepreneurial rent as a return to judgment. Entrepreneurs have the ability to repeatedly make correct choices where others would make mistakes. However, Casson (1995, 2005) also makes several other contributions to the theory of entrepreneurship.

The first contribution that he makes is that he introduces the firm as the mechanism in which profit opportunities are executed.

In an idealized world, entrepreneurial ideas could simply be licensed through competitive bidding to other people who exploit them. But the limits of the patent system are such that the licensing of ideas is impracticable. Entrepreneurs must exploit their own ideas, and this draws them into the management of teams. The firms come into being as a nexus of contracts—notably, though not exclusively, contracts of employment. The entrepreneur must choose between leadership and supervision as a method of motivating the firm's employees. The entrepreneur becomes more than a speculator or arbitrager; he becomes a leader and manager as well. (Casson 1995, pp. 129–30)

Because an entrepreneur must establish a firm to exploit his entrepreneurial ideas, he must also incur the costs associated with doing

so.⁵ In particular, the management of teams causes the entrepreneur to bear the costs of solving the agency problems of moral hazard and asymmetric information (Alchian and Demetz). The mitigation of these costs highlights another major function of the entrepreneur. "One way that the entrepreneur can [mitigate agency costs] is by influencing the opinions of others. He attempts to align their judgments with his own" (Casson 2005, p. 341). An entrepreneur aligns the judgments of others with his own by exercising leadership and information management. Leadership is especially important for employee motivation, as a strong leader is able to emphasize the importance of commitment to the task at hand and thus decrease the monitoring costs of the firm. In essence, a strong leader acts to increase the cost of slacking to team members through guilt or a loss in self-esteem.

An entrepreneur can also reduce the costs of asymmetric information by sharing information about his venture with his business partners. In this respect, Casson highlights an entrepreneur's role as an information manager.

Finally, Casson (2005) views the entrepreneur as a market maker. This function is closely related to information management. Consistent with the information paradigm of entrepreneurship (Hayek; Shane), Casson argues that entrepreneurs possess unique information sets that allow for the identification of market-making opportunities that others cannot.

Resource-based View (Rents from Innovation, Risk Taking, and Judgment)

In the resource-based view (RBV) of the firm, entrepreneurial rents are typically character-

ized by those rents accruing to innovative behavior (Alvarez and Barney; Mahoney and Pandian). Like Casson, the resource-based view argues that a firm is needed to exploit entrepreneurial opportunities. However, in this case, it is the ownership of assets that brings the firm into existence (Foss and Klein). The resource-based view suggests that firms consist of a heterogeneous set of productive resources. These resources provide a bundle of potential services that are subjectively defined by an entrepreneur with reference to their use (Mahoney and Michael; Penrose). Thus, in the same way that unique information sets can lead to entrepreneurial discoveries (Hayek; Kirzner 1979; Shane), a firm's unique resources and services of those resources can lead to unique production opportunity sets.

Penrose defined three general services of the entrepreneurial resource: versatility, attracting capital, and judgment. Entrepreneurial versatility refers to a sense of market recognition (opportunity). The ability to attract capital is similar to Casson's (2005) reference to an entrepreneur's ability to attract funds for highly risky ventures, but it also highlights the entrepreneur's creative ability to come up with novel sources of capital. Finally, like many of the other conceptualizations of the entrepreneur throughout economic history, Penrose suggests that a primary function of the entrepreneurial resource is to make judgments under uncertainty.

Following the framework laid out by the resource-based view, "entrepreneurial (Schumpeterian) rent may be achieved by risk taking and entrepreneurial insight in an uncertain/complex environment" (Mahoney and Pandian, p. 364). These rents are difficult to attribute to any specific resource; instead, they represent the value created by the entrepreneur's unique (heterogeneous) combination of assets (Mahoney). In this view, entrepreneurial rents are the synergy rents created by cospecialized assets (Lippman and Rumelt 2003a). This view of entrepreneurship is essentially a form of judgment but is tied explicitly to the crafting of the production function and firm organization. It shares some elements of Casson's approach, in that it requires a firm, and

⁵ Foss and Klein also point out that an entrepreneur must establish a firm to exploit their entrepreneurial ideas. However, they argue that it is the entrepreneur's role as a decision maker and not the lack of a market for entrepreneurial ideas that is the *raison d'être* for the firm. Decision making requires that entrepreneurs allocate resources among different activities and this implies that the ownership of assets is required. Similar to the transaction cost economics and resource-based view literatures, it is this ownership of assets that establishes the boundaries of the firm.

Table 1. Summary of the Historical Views of Entrepreneurial Rents

Author	Capability	Activity	Payment Received
Cantillon	Uncertainty bearing	Management	Uncertain selling price minus certain buying price, or vice versa
Von Thünen	Judgment	Management	Profit minus (interest on invested capital, insurance premiums, salaries and wages)
Knight	Judgment, uncertainty bearing	Innovation	Monopoly revenue minus contractible production costs
Schumpeter	Intuition	Innovation	Management salary or Ricardian gain
Kirzner	Alertness, optimization	Arbitrage	Price in market 1 minus price in market 2
Casson	Judgment, leadership	Management, innovation	Risk-adjusted Ricardian gain minus costs of supervision and capital
RBV	Risk bearing, judgment	Innovation	Temporary monopoly (Ricardian) gain

RBV is resource-based view.

to Schumpeter, in that rents arise from innovative activities.

Entrepreneurship and Strategy: Commensurability of the Historical Views

As the review presented above indicates, past literature has described entrepreneurship and the returns to entrepreneurship in different ways. However, several key elements appear to be consistent in these conceptual models.

First, most scholars recognize that entrepreneurship is a process that includes discovery of a value-creating opportunity and deliberate exploitation of the opportunity, which leads to a new or larger rent stream. Where the literature diverges is in the nature of entrepreneurial opportunities and how they are exploited. For instance, Kirzner suggests that entrepreneurs discover market frictions and engage in arbitrage activities to exploit erroneous valuations. One starts from a position of disequilibrium. On the other hand, the Schumpeterian approach to creating value is to disrupt the *status quo* by introducing innovations. The commercialization of these innovations exploits the profit opportunities available in the disequilibrium environment.

What is important to both the Kirznerian and the Schumpeterian approach is that the underlying entrepreneurial behavior is unique. In other words, no two entrepreneurs discover the same information (Hayek) or evaluate opportunities in the same way. In this sense, entre-

preneurial rents from this discovery process are more like Ricardian rents than Paretian rents. Like other scarce resources, entrepreneurs receive a monopoly-type payment because no other resource can behave as they do, and thus no competition to their services exists.

In addition to the being a monopoly-type return for unique behavior, there are also several other key features of entrepreneurial rents. Table 1 provides a summary of the historical treatments of entrepreneurial rents.

Among the commonalities between the various scholarly works is that entrepreneurial rents appear to be derived from a select few dynamic capabilities of the entrepreneur.

1. *Alertness to profit opportunities (Kirzner)*. To create new rent streams and growth, an entrepreneur or entrepreneurial firm must be alert to new opportunities in the market as they present themselves. If these are missed, other entrepreneurs or firms will recognize them and the potential entrepreneurial rent stream will be lost as competitors gain first-mover advantages and earn above-average profits and growth.

2. *Judgment (Knight, Casson, RBV) and intuition (Schumpeter)*. Entrepreneurs must also exercise superior judgment and intuition. This capability permits the entrepreneur to better discern values of inputs and outputs than other agents in the market, to better deal

with imperfect information, and to better assess profit potential.

3. *Control of assets* (Cantillon, Knight, Kirzner, Schumpeter, Casson, Friedman, RBV) and/or the ability to attract additional capital (Casson, RBV). Firms require the services of productive resources to take advantage of growth opportunities (Penrose; Schumpeter 1934). Capital might be needed to fund an arbitrage opportunity, labor might be needed to make a new product, or management expertise might be required to analyze a new market. However, these resources do not necessarily need to be owned by the entrepreneurial firm, but their services must be available to it.

4. *Risk taking or uncertainty bearing* (Cantillon, Knight, RBV). Perhaps the most significant entrepreneurial capability is the ability to execute one's decision (McGrath and MacMillan). This capability reflects the ability of the entrepreneur to take risks and to bear uncertainty. Moreover, it represents a (scarce) capacity to execute the entrepreneurial strategy, to "make the leap."

It is through the unique combination of these four entrepreneurial capabilities that an entrepreneur provides productive services to a firm. And although these services can only be defined with respect to their specific use, they can be broken into two broad categories: arbitrage services and innovation services. However, in either case, the underlying element in all of the above definitions is that these services create new rent streams for the firm by changing some aspect of the firm's business model.

The literature also points out that entrepreneurial rents are transitory. Unlike monopoly rents and wages, the entrepreneur does not receive a constant return for his services. As Mahoney and Pandian point out, "entrepreneurial rents are inherently self-destructive due to the diffusion on knowledge" (Mahoney and Pandian, p. 364). This is most evident in Schumpeter's process of creative destruction but is consistent with the other views of entrepreneurship. As entrepreneurs reveal profit opportunities through their own actions, others

imitate their behavior, and the profit opportunities are quickly dissipated away.

These conceptual models differ in their treatment of two important aspects of entrepreneurship. Many definitions of entrepreneurship consider the entrepreneur to be an individual, particularly those from the classical schools. Schumpeter, Casson, and the literature of the resource-based view of the firm, on the other hand, point to the entrepreneur as being interior to the firm. They argue that the exploitation of entrepreneurial opportunities must take place within a firm either because there is no efficient market for entrepreneurial ideas (Casson 1995) or because entrepreneurship requires that entrepreneurs allocate resources, which implies firm ownership of assets (Foss and Klein; Schumpeter 1934).

The second area of disagreement is whether entrepreneurial rents are *ex ante* contractible. Cantillon, Von Thünen, Knight, and Casson define entrepreneurial rents as the residual claims to the returns from the entrepreneurial activities. This residual is uncertain *ex ante* and thus cannot be contracted. The same is essentially true in Schumpeter's definition: instead of receiving the residual profits of activity, the entrepreneur substitutes an *ex ante* contractible payment for his or her services. Kirzner defines entrepreneurial rents to be contractible. In the case of Kirzner, the entrepreneur possesses information that allows him to know with certainty what the payoffs of his arbitrage activity will be *ex ante*. Thus, he could contract his services for this amount before exploiting the profit opportunity.

Payments to Entrepreneurship: A Dynamic Model

We develop a dynamic model of revenues and costs to illustrate the ways in which entrepreneurial activities can be explicitly characterized. To simplify our analysis, we consider a two-period model in which the parameters can change between periods. Entrepreneurial rents (ER) are generated through changes in revenue (REV), production costs (PC), the production function, or transaction costs (TC),

$$(1) \quad ER = \Delta \text{Revenue} - \Delta \text{Production Costs} \\ - \Delta \text{Transaction Costs},$$

where $\Delta \text{Revenue} = \text{REV}_t - \text{REV}_{t-1}$, $\Delta \text{Production Costs} = \text{PC}_t - \text{PC}_{t-1}$, $\Delta \text{Transaction Costs} = \text{TC}_t - \text{TC}_{t-1}$, and t is the time period.

Revenue

The entrepreneur can generate entrepreneurial rents by changing the revenue streams of the firm. This can be achieved by exploiting new markets and creating new products.

New Markets

Entrepreneurial rents accrue to the entrepreneur who is alert to arbitrage opportunities and exercises judgment to exploit those opportunities. One way in which these rents can be generated is to exploit new information about price differentials in different markets. This type of arbitrage rent refers to the most basic type of Kirznerian rent—exchanging a low-valued market (or segment) for the firm's product for a higher valued market—and can be denoted as in Equation (2),

$$(2) \quad p_t y_t > p_{t-1} y_t,$$

where t is time period i , where $i = (t, t-1)$; p is output price; and y is production function $f(\cdot)$.

However, an entrepreneur can also generate entrepreneurial rents by entering previously unexploited markets for the firm's existing product line. This is a particular type of arbitrage activity. Instead of substituting one price for another, the market for a product or service can be expanded across geographic location and market segments. In this situation, positive entrepreneurial rents are generated as the number of goods sold increases,

$$(3) \quad p_t y_t > p_t y_{t-1},$$

where t is time period i , where $i = (t, t-1)$; p is output price; and y is the amount of goods sold (=production function $f[\cdot]$).

Production Costs

The entrepreneur can act to change the production costs of the firm. The entrepreneurial rent is then the difference between the production costs from period to period. The change in firm production costs is defined as

$$(4) \quad \Delta \text{Production Cost} \\ = (C_t X_t + w_t l_t + v_t l_t + r_t k_t) \\ - (C_{t-1} X_{t-1} + w_{t-1} l_{t-1} + v_{t-1} l_{t-1} \\ + r_{t-1} k_{t-1}),$$

where t is time period i , where $i = (t, t-1)$; C_i is a vector of per unit costs for purchased inputs; X_i is a vector of production inputs; w_i is the per unit wage rate; l_i is labor; v_i is the per unit supervision rate; r_i is the interest rate; and k_i is capital.

Input Costs

An entrepreneur can generate rents by being alert to cost-saving opportunities in the market. Positive entrepreneurial rents accrue to the entrepreneur who is able to substitute lower input costs (c_t) for higher input costs (c_{t-1}). In the model above, the positive rent generated from this alertness would be represented as

$$(5) \quad (C_{t-1} - C_t)X,$$

where $C_{t-1} > C_t$ and X is constant between periods.

Notice also that these Kirznerian rents can be negative, as is the case when $C_{t-1} < C_t$; the entrepreneur exercises poor judgment and purchases inputs at a greater cost in period t than period $(t-1)$.

Labor Costs

To exploit profit opportunities in the market, Casson (1995) argues that entrepreneurs must elicit the help of others and establish a firm. To the extent that the entrepreneur can substitute low-cost labor for high-cost labor, entrepreneurial rents will be gained according to Equation (6),

$$(6) \quad (w_{t-1} - w_t)l,$$

where $w_{t-1} > w_t$ and l is constant between periods.

Cassonian (Organizational Leadership) Innovation

A firm is essentially a nexus of employment contracts; thus, the management of teams becomes a primary activity of the firm (Alchian and Demetz; Casson 1995). Because the entrepreneur cannot monitor the efforts of all employees, supervisors are hired to motivate employees and minimize the occurrence of moral hazard and asymmetric information. In doing so, the entrepreneur reduces the number of employees that he himself must monitor but accrues additional costs. However, the cost of hiring supervisors can be substituted by leadership ability (Casson 1995). By emphasizing the importance of commitment to the task, entrepreneurs are able to increase the cost of slacking (or decrease the cost of effort) for employees through guilt or loss of self-esteem. Thus, entrepreneurs can generate rent by exercising leadership and reducing the amount of labor required,

$$(7) \quad (l_{t-1} - l_t)w,$$

where $l_{t-1} > l_t$ and w is constant between periods.

Capital Costs

This type of rent is similar to the Kirznerian cost-saving rents describe above; an alert entrepreneur recognizes arbitrage opportunities in the capital market and exercises judgment to generate rents. In this case, high costs of capital are substituted for lower costs of capital,

$$(8) \quad (r_{t-1} - r_t)k,$$

where $r_{t-1} > r_t$ and k is constant between periods.

Schumpeterian (Process/Product) Innovation

According to Schumpeter (1991), entrepreneurs combine existing resources and technologies in new and unique ways in the pursuit of profits. In this way, rents are generated through innovation. The gains from innovation can occur from saving capital, saving labor, or both. Moreover, innovation can bid (different) capital from another sector. With the use of the notation from above, Schumpeterian rents are created when

$$(9) \quad p_t f_t(X_t, l_t, k_t) > p_{t-1} f_{t-1}(X_{t-1}, l_{t-1}, k_{t-1}),$$

where $f(\cdot)$ represents the production function.

Note that the product produced in period $(t-1)$ (y_{t-1}) is not necessarily the product produced after the innovation (y_t).

Transaction Costs

Minimizing transaction costs can also generate rents. Transaction costs can be categorized into two types: (1) market costs and (2) contract costs. Following Coase and Williamson, the optimal choice of organizational structure will minimize transaction costs. The change in firm transaction costs is defined as

$$(10) \quad \Delta \text{Transaction Cost}$$

$$= \Delta \text{Market Costs} + \Delta \text{Contracting Costs},$$

$$(11) \quad \Delta \text{Market Costs}$$

$$= \beta_{1,t}(s_t + b_t) - \beta_{1,t-1}(s_{t-1} + b_{t-1}), \text{ and}$$

$$(12) \quad \Delta \text{Contracting Costs}$$

$$= \beta_{2,t}(d_t + m_t) - \beta_{2,t-1}(d_{t-1} + m_{t-1}),$$

where $\beta_{1,i} + \beta_{2,i} = 1$, where $i = (t, t-1)$; t is time period i ; s_i is market search cost; b_i is market bargaining cost; d_i is contract design cost; and m_i is contract monitoring cost.

Market Mechanism

The two primary costs associated with using the market mechanism to conduct transactions are (a) search costs s and (b) bargaining costs

b. Search costs refer to the costs of time, energy, and resources required to find a partner to exchange with in the market, whereas bargaining costs refer to the costs of negotiating the terms and conditions of exchange between the partners. Rents are generated when entrepreneurs discover new search and bargaining methods that reduce the costs of transacting in the market, such that

- a. search costs $s_{t-1} > s_t$ and
- b. bargaining costs $b_{t-1} > b_t$.

Contract (Hierarchy) Mechanism

An alternative available to the entrepreneur is to use contracts as the mechanism of exchange. The costs associated with this mechanism are (c) setup costs and (d) monitoring costs. Unlike the market mechanism, contracts establish a long-term relationship in which the partners do not have to search for or bargain with each other each time they want to exchange goods or services. Instead, terms and conditions of exchange are set from the onset of the contract, and the partners exchange their products according to these terms for the life of the contract. As such, setup costs associated with contracts are significant. In addition to the terms of sale (equivalent to bargaining in the market), parties will also negotiate contingency plans for what will happen should conditions not be met. The costs of establishing contracts are thus significantly greater than the costs associated with the market mechanism. However, the benefit of the contract mechanism is that the parties need only search and negotiate once to exchange their products. Under the market mechanism, search and negotiation costs are incurred every time a transaction occurs.

Also associated with contractual arrangements are the costs of monitoring. Monitoring is necessary to minimize the possibility of opportunistic behavior by the exchange partner. With respect to these two types of contracting costs, rents can be generated if an entrepreneur discovers a method of designing more efficient contracts or exercising leadership to mitigate monitoring costs, such that

- c. contract design costs $d_{t-1} > d_t$ and
- d. contract monitoring costs $m_{t-1} > m_t$.

Schumpeterian (Organizational Governance) Innovation

Organization innovation (Mahoney) can also be a source of entrepreneurial rent. The choice of governance structure is indicated in the model by the values of β_1 and β_2 . If the market mechanism is chosen, $\beta_1 = 1$ and $\beta_2 = 0$, and if the contract mechanism is chosen, $\beta_1 = 0$ and $\beta_2 = 1$.

The choice of β_1 and β_2 is dependent on the abilities of the entrepreneur. Entrepreneurs are not homogeneous; inevitably, some entrepreneurs will have greater search capabilities or superior negotiating skills, whereas others might excel at motivating partners to cooperate or have legal expertise in writing or enforcing contracts. Entrepreneurs with superior skills in searching for arbitrage opportunities and bargaining will minimize transaction costs by choosing the market mechanism as the preferred method of exchange. On the other hand, entrepreneurs with a comparative advantage in leadership/supervision and contract enforcement will generate rents by using contracts to coordinate exchange.

Imputing Economic Returns to Entrepreneurial Behavior

In a recent paper, Ross constructed a system dynamics model of a three-site hog production operation to compute the value of entrepreneurial rents arising from several different arbitrage opportunities and innovations that can be exploited by an entrepreneurial manager. By explicitly modeling these activities, Ross identified which factors of production were contracted and thus receive an *ex ante* fixed payment and which resources generated non-contractible flows that can be allocated to entrepreneurial behavior. The following section is intended to highlight the results of that study and to provide a bridge to the conceptual model of entrepreneurial rents presented above.

Ross simulates 11 entrepreneurial activi-

ties, including five arbitrage activities in output and input markets, one Schumpeterian (process/product) innovation, a Cassonian (organizational leadership) innovation, and four Schumpeterian organizational innovations. With the exception of the arbitrage activities in the output and input markets, none of these activities represent a pure strategy. In fact, most of the entrepreneurial activities are modeled as a combination of both arbitrage and innovation. These 11 entrepreneurial activities give rise to transitory rents given uncertainty, casual ambiguity, and competitive forces that cannot be allocated to any firm resource *ex ante*. By comparing the various simulations to a base model⁶ and by contracting for various resources needed in the production process, it is possible to capture the flow of economic returns to the services of the entrepreneurial resources. Entrepreneurial activities are implemented at the start of each simulation run, and returns accrue to the firm until the profit opportunity is removed by the market.⁷ As in the conceptual model presented above, entrepreneurial rents are calculated as the change in profits that result from each entrepreneurial behavior, *ceteris paribus*.

In this paper, we will focus on five different entrepreneurial activities simulated by Ross—two arbitrage and three innovations. These activities are presented in Table 2 along with the conceptual formulation of the rents that they generate. Note the base case is the model represented at $(t - 1)$.

The entrepreneurial rents generated from arbitrage activities in the output and input markets are relatively straightforward. Entrepreneurs exploit price differentials in output

(market hog) and input (corn) markets; and it is simply the size of the price discrepancy times the number of transactions that can be conducted at the disequilibrium prices that determines the payment to the entrepreneur resource. To model the Schumpeterian (process) innovation, Ross simulates the introduction of a new production technology: segregated early weaning. This technology allows the firm to increase the number of hogs it is able to market each year while maintaining the quality of the end product. On the other hand, segregated early weaning can lead to sow health problems and increased sow herd replacement costs. The Cassonian (organizational leadership) innovation takes the form of an employee incentive contract that reduces the agency costs associated with moral hazard by aligning the incentives within the organization. By introducing these incentives, employees are induced to exert high effort, thus reducing the amount of labor and supervision needed in the production process.⁸ Finally, a Schumpeterian (organizational governance) innovation is also modeled. Unlike the previous simulations, the production function is held constant, and it is the method of procurement and marketing that changes. In this case, the firms change from the market mechanism ($\beta_{1,t-1} = 1, \beta_{2,t-1} = 0$) to the contract mechanism ($\beta_{1,t} = 0, \beta_{2,t} = 1$).⁹

The results of these simulations can be seen in Figure 1. The sizes of the cumulative entrepreneurial rents are not indicative of inherent (or ordered) relative values of the five modeled entrepreneurial activities. The rent streams are determined by a complex set of feedback loops and delays that create nonlinearities. Moreover, the simulation runs have embedded actual price series for inputs and outputs; relative prices over a different simu-

⁶ The base model represents the case in which no entrepreneurial activities exist. As such, all returns are allocated to resources such as land, labor, capital, and management, and none are allocated to entrepreneurial resources. The base model also assumes that inputs and outputs are procured and sold, respectively, by the market mechanism.

⁷ The rate at which returns to entrepreneurial activities are dissipated by the market differ by the type of activity. For arbitrage activities, above-average returns are removed within 2 years, and for innovations activities, this period is 5 years. These assumptions reflect the complexity of the activity.

⁸ For modeling purposes, it is assumed that decreasing the amount of labor is the dual to increasing the amount of market hogs. Thus, in the simulation model, this innovation is modeled such that a premium is paid for high effort and such that the firm is able to monitor this effort by examining the mortality rate of market hogs (i.e., low mortality rate = high effort).

⁹ Contract prices are set to the 5-year historical average of each respective input and output. Furthermore, contracting costs are also explicitly included in the simulation.

Table 2. Entrepreneurial Activities Simulated by Ross

Entrepreneurial Activity	Rent Generated
Hog market arbitrage	$p_t y_t - p_{t-1} y_t$
Corn market arbitrage	$(C_{t-1} - C_t)X$
Segregated early weaning (Schumpeterian process innovation)	$p_t f_t(X_t, l_t, k_t) - p_{t-1} f_{t-1}(X_{t-1}, l_{t-1}, k_{t-1})$
Employee incentives (Cassonian organizational leadership innovation)	$(l_{t-1} - l_t)w$
Contracting (Schumpeterian organizational governance innovation)	$\beta_{1,t}(s_t + b_t) + \beta_{2,t}(d_t + m_t) - \beta_{1,t-1}(s_{t-1} + b_{t-1}) - \beta_{2,t-1}(d_{t-1} + m_{t-1})$

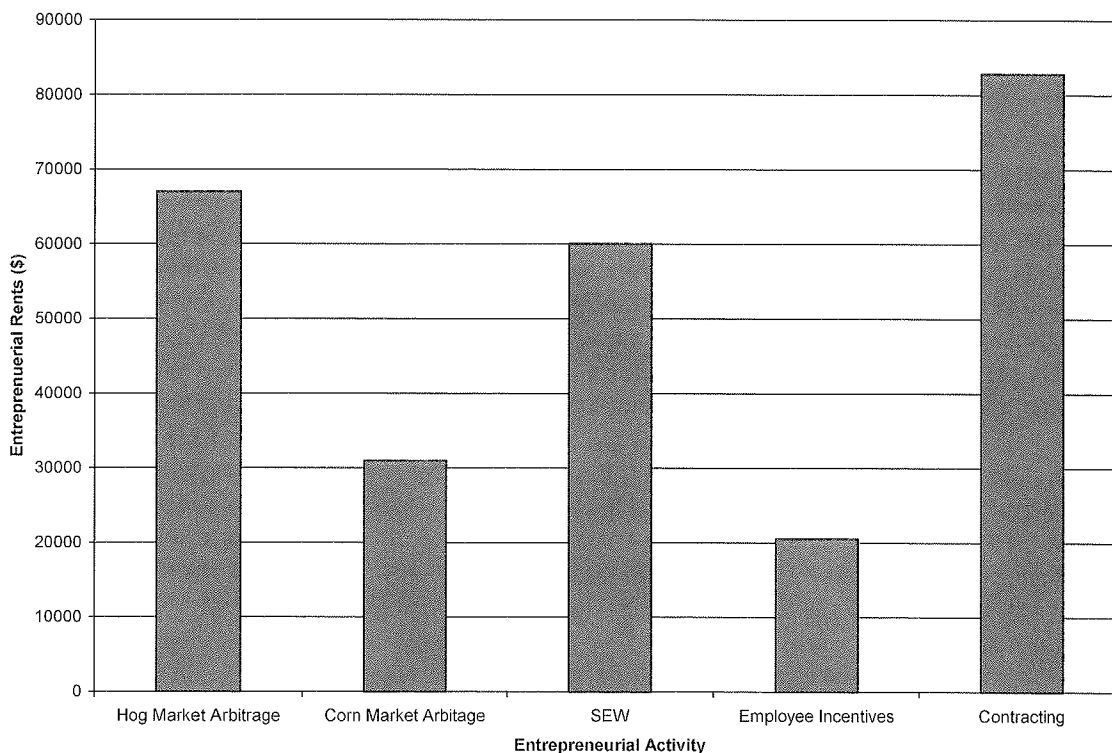
lation period would alter the rent streams. The important takeaway from the simulations is that by fully characterizing the prices, production function and costs, and transaction costs (as in the conceptual model), one can impute that portion of the *ex post* profits to the non-contractible resource: entrepreneurship.

Discussion and Conclusions

Entrepreneurs are the driving forces in the creation of new profit streams for a firm because

they provide the necessary services (i.e., alertness, judgment, access to resources, and risk taking) required to discover and exploit potentially productive opportunities. As payment for these services, they receive entrepreneurial rents from the profit streams.

In this paper, a conceptual model was presented to illustrate a method for the valuation of entrepreneurial rents. The central premise of this model is that the payments to an entrepreneur should be residual, noncontractible payments after all contractible payments are

**Figure 1.** Cumulative Rents from Five Simulated Entrepreneurial Strategies (Source: Ross)

made to bring the firm's resources to bear on a new opportunity (innovation or arbitrage). This framework is consistent with the full imputation of rents to the productive resources of the firm (Friedman; Lippman and Rumelt 2003b; Winter). The model differs from previous models of factor payments by making the various types of innovation and arbitrage choices explicit across time and by separating changes in contractible costs (e.g., interest and wages) associated with the new strategy from returns to judgment, alertness, asset deployment, and risk bearing.

The conceptual model presented here is supported empirically by Ross, who simulates several entrepreneurial behaviors in a system dynamics model of a three-site hog production operation. By explicitly modeling how these various entrepreneurial behaviors change different aspects of the hog operation (i.e., production, marketing, procurement), Ross is able to capture the flow of returns that these activities generate over time and is thus he is able to value the entrepreneurial rents that they create.

This paper offers several contributions to the growing field of strategic entrepreneurship. First, this paper highlights the broad range of definitions of entrepreneurial behaviors that exist in the literature. We reduce the apparent incommensurability of these definitions, synthesizing them into a single conceptual model. Although the conceptual model might not reflect all definitions of entrepreneurship, it is flexible enough to incorporate innovations in both production technology and organizational design. Moreover, it can illustrate arbitrage strategies in input and output markets, a central theme in the historical development of models of entrepreneurship.

Furthermore, the conceptual model presented in this paper is also consistent with a resource-based approach to the study of entrepreneurship. A firm is composed of a bundle of productive resources (Penrose; Wernerfelt). However, valuation of firm resources has been a concern for resource-based theorists, particularly when not all factors are priced (Lippman and Rumelt 2003b). This paper offers a potential solution on how to value one of these

firm resources: the entrepreneurial resource. This resource allows the firm to identify potential new business opportunities, make sound value judgments, gain access to resources, and execute their new business ideas. In essence, the entrepreneurial resource is responsible for change within the firm; thus, it is by design that the entrepreneurial rent model presented in this paper captures the returns to those changes.

The analysis provided here is consistent with the growing literature on strategic entrepreneurship and would support the initiative to develop two lines of research within the strategic management literature: one relevant to the topics of entrepreneurial management, such new business discovery and value creation, and the other to topics of administrative management such as sustaining competitive advantage and coordination (Michael, Storey, and Thomas).

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