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Without Judgment: An Empirically-Based Entrepreneurial Theory of the Firm

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I: Prelude

By the time he was twenty-four, Milton Snavely Hershey had failed at his first candy venture in Philadelphia. After he failed again in New York, none of his wealthy maternal uncles would lend him any money. But a devoted aunt offered collateral on a bank loan to get his caramel company off the ground in Lancaster, PA. And with a British buyer's large order coming in just the nick of time, the Lancaster Caramel Company took off and grew to literally transform its surroundings into the town we know today as Hershey, PA.

-- Summarized from *Hershey: Milton S. Hershey's Extraordinary Life of Wealth, Empire, and Utopian Dr*eams by Michael D'Antonio. Simon and Schuster, 2006

Earl Bakken developed the first wearable artificial pacemaker in 1957 as a result of a fatal problem at the University of Minnesota hospital. Dr. C. Walton Lillihei was performing life-saving surgery on children with blue baby syndrome. That surgery often left the children needing to be temporarily attached to a pacemaker. The pacemakers at the time were large devices that required their own carts and relied on wall current for power.

As a result of a power blackout on October 31, 1957, one of Dr. Lillihei's young patients died. Dr. Lillihei had worked with Bakken before, and asked him the next day if he could solve the problem. Bakken found a circuit diagram for a metronome in Popular Electronics, and a few weeks later, Bakken delivered a battery-powered transistorized pacemaker about the size of a few decks of cards to Dr. Lillihei. The Food and Drug Administration did not start regulating medical devices until 1976, so much to Bakken's astonishment, when he came in the next day, he found the pacemaker already in use on a patient.

Over the next several years, Bakken and [the company he founded] Medtronic went on to work with other doctors to develop fully implantable pacemakers, but they also veered toward bankruptcy. Borrowed money kept Medtronic going.

-- Source: *Wikipedia* and corroborated in personal conversation with Earl Bakken

The Post-it note was invented in 1968 by Dr Spencer Silver, a 3M scientist who stumbled upon a glue that was not sticky enough. In 1974, a colleague of his, Arthur Fry, was singing in a church choir and frustrated that his bookmarks kept falling out of his hymnal. He applied some of Silver's glue to his markers. 3M launched the product in 1977, but it failed as consumers had not tried the product. A year later 3M swamped Boise, Idaho with samples. 90% of people who tried them said that they would buy the product. By 1980 the product was sold nationwide, and a year later they were launched in Canada and Europe.

-- Source: *Wikipedia*

II: Introduction

The entrepreneur has always been central to Austrian conceptions of market process. And Austrian views have made considerable impact in the growing scholarship in entrepreneurship. Recently, however, the Austrian conversation is being expanded to include economic organization as well as market process. It is to this conversation that the current paper is addressed.

- What is the role of entrepreneurial judgment? In fact, what counts as judgment?
- How is judgment related to capital heterogeneity? Is this an antecedent or consequent to the entrepreneurial process?
- How does judgment or the lack of it resolve the coordination problem within firms? And how is that related to economic organization as a whole?

These are some of the questions we propose to tackle using recent empirical work in entrepreneurship that has identified key elements of what might reside inside the "black box" of entrepreneurial judgment. In doing so, we specify a framework for economic organization that substantially differs from current Austrian views, yet coheres with and builds upon key themes dear to Austrians – including imagination, individual freedom, property rights, dispersed knowledge, the market as "a game without goods" and the powerful and inescapable role of human action in building and sustaining a value creating free society.

III: Review of recent work in Austrian economics

Although the Austrians might be described as 'late starters' in paying some attention to economic organization, they have (collectively) launched a vigorous campaign to make up for lost time (Foss et al., 2002; Ioannides, 2006). Austrian ideas specific to the firm have grown rather naturally out of the central body of Austrian thought with its focus of subjectivism, dispersed knowledge, disequilibrium, market process and entrepreneurship (Mises, 1949; Hayek, 1945, 1978; Rothbard, 1962; Kirzner, 1973; Lachmann, 1977). Of course, in most contributions the concept of entrepreneurship takes center stage. Indeed, Langlois has simply stated that

> The firm exists because of entrepreneurship… In the end, the cluster of ideas I find central to explaining the firm is the same cluster of ideas that is central to the literature on entrepreneurship. (Langlois, 2005:2).

In this review, we looked at approximately 40 articles that discuss the firm in the light of Austrian ideas. From these articles, we extracted three central themes that pertain to the theory of the firm (Foss et al., 2002:3). First, there is a group of articles concerned with entrepreneurial approaches to the internal organization of firms. These mainly draw on Hayek's insights on dispersed knowledge. A second group of articles takes up what is distinctive about entrepreneurial decision-making. This consists of an ongoing conversation in which the concept of judgment appears to be central. A third group of articles concerns itself with capital heterogeneity. This is a newer strain in the literature, but potentially an important one owing to its links with the resource-based view in strategic management. These three strains in the literature, along with a list of articles in each strain, are summarized in Table 1.

-- INSERT TABLE 1 HERE --

Strain 1. Austrian approach to internal organization: dispersed knowledge

The central thrust in the first strain on the internal organization of firms is that Austrians ideas that have traditionally been used on analyzed market processes also provide insights into the way organizations work, and that these insights are not captured by the agency or transaction cost models that pervade dominant paradigms for the economic analysis of organizations. Several articles (for example Foss, 1999) draw heavily on Hayek's subjectivism and his insights into the dispersed nature of knowledge (Hayek, 1937, 1945). Naturally, there are strong echoes of the socialist calculation debate in these papers viz. the inevitable ignorance of central decision makers (Hayek, 1944) and the consequent conclusion that the kinds of coordination problems that undermined socialism either exist to some degree in organizations, or must have somehow been overcome by them.

It may be useful to note here that these very same issues have been integrated into a compelling theoretical framework by an organizational researcher, Harry Tsoukas, in a widely cited article on firms as distributed knowledge systems. Tsoukas (1996) offers the definitive statement of the problem of knowledge in firms, evocative of what Hayek did for the problem of knowledge in society. Taking Hayek as his starting point, Tsoukas points out the fundamental similarity between a society and a firm: that both face the problem of how to utilize widely dispersed knowledge that exceeds the span of control of any one mind (p.12). He then makes his chief claim:

> that firms are distributed knowledge systems in a strong sense: they are decentered systems. A firm's knowledge cannot be surveyed as a whole; it is not self-contained; it is inherently indeterminate and continually reconfiguring (p.13).

Moreover, according to Tsoukas firms have a very limited ability to overcome this distributedness.

Austrians have been quick both to affirm Tsoukas' arguments and to analyze the effectiveness of two organizational solutions to these problems[1]. The first is the role of routines and rule-following behavior in helping to partially overcome the problems created by dispersed, tacit knowledge (Loasby 1991; Dulbecco and Garrouste, 1999; Foss, 1997). Here the kinship between Austrian perspectives and the capabilities view of strategy is especially strong (Nelson and Winter, 1982). The second is the role of shared cognition and cognitive leadership, a topic that Witt (1998, 2003) in particular has contributed to. In Witt's analysis, whether resource owners need to be coordinated on the entrepreneur's conception of business (or not) is an important issue in the entrepreneur's choice between using a firm or markets to pursue an imagined opportunity (Witt, 2007).

Strain 2. Austrian approach to decision making: entrepreneurial judgment

Several papers in the Austrian literature on the firm focus on what is distinctive about entrepreneurial decision-making with regard to the organization and sustenance of firms. There are several different contenders, popular among which are:

1. *Alertness.* The role of entrepreneurial alertness and the discovery of opportunities is frequently emphasized as an important aspect of entrepreneurial decision making

[1] However, see Foss and Foss, 2006 for a more skeptical view of these 'solutions'.

(Ioannides, 2006). Kirzner characterizes entrepreneurship as "a responding agency. I view the entrepreneur not as a source of innovative ideas ex nihilo, but as being alert to the opportunities that exist already and are waiting to be noticed." (Kirzner, 1973, p. 74).

2. *Imagination.* Some theorists emphasize the role of imaginative visions in the choice of firm versus market – Witt (1998; 2007) has recently been a prominent spokesperson for this view, anteceded by Lachmann (1976) and Shackle (1979).
3. *Judgment.* The most substantial body of the literature argues that entrepreneurial decision making is about judgment in the face of Knightian uncertainty (Knight, 1921). In other words, entrepreneurial decision making applies to situations where there is no obviously correct model or decision rule that can be applied, or when the data is unreliable or incomplete. As Langlois (2005:5) puts it:

> Judgment is the (largely tacit) ability to make, under conditions of structural uncertainty, decisions that turn out to be reasonable or successful ex post.

In our discussion on judgment later in this paper, we build on the direct relationship Knight (arguably) established between judgment and the theory of the firm. According to Knight, "[U]ncertainty explains profit and loss; but profit, when it occurs, is not properly a "reward for risk-taking" even if the expectation of gain may be the incentive for assuming the entrepreneurial role. Nor is entrepreneurship to be treated as a "factor of production" on par with others, since it is not at all in the same sense measurable or subject to varying proportions and marginal imputation. Profit (when positive) is not the price of the service of its recipient, but a "residual", the one true residual in distribution." (Knight, 1957:lix). In other words, because poor judgment can be disguised as bad luck, judgment is non-contractible (Barzel, 1987). Therefore entrepreneurs can be seen as people who specialize in exercising judgment. They do so by establishing their own residual, i.e. starting their own firms by hiring the services of others and commanding assets that are more feasible to monitor than judgment is (Boudreaux and Holcombe, 1989; Langlois and Cosgel, 1993).

While the theoretical link between judgment and the firm is straightforward enough, two important questions remain. The first has to do with 'what conception of the firm is involved in the Knightian argument?' (Langlois, 2005:16). The second question looks at 'what is judgment really?' We will come back to both of these questions shortly.

Strain 3. Austrian approach to the organization of assets: <u>capital heterogeneity</u>

An appreciation of the role of entrepreneurial judgment leads to the third strain in the literature: capital heterogeneity. This emerges straightforwardly from asking, 'judgment about what?' the answer to which, in this strain, is 'about the employment of resources'. However, Austrians point out that resources are not given data but instead are discovered and created by entrepreneurs envisioning and planning how assets may be used. The key idea here is that resources/assets have attributes (Foss et al., 2002; 2007; Foss and Foss, 2005). In a world of true uncertainty entrepreneurs are likely to be ignorant of at least some of the relevant attributes an asset may yield, and therefore there is room for them to discover and create new attributes in the process of using an asset in production. Thus the discovery and creation of these attributes is an important function of entrepreneurship.

This line of argument picks up on the work of Lachmann (1956, 1977), Penrose (1959) and Kirzner (1966). It was Lachmann (1956) who pointed the way by emphasizing

the heterogeneity of capital (Lewin, 2005). Penrose explicitly pointed out how the productive *services* firms might achieve from their resource set, and the way this depended on the subjective perceptions of managers: "If we can discover what determines entrepreneurial ideas about what the firm can do and cannot do, that is, what determines the nature and extent of the 'subjective' productive opportunity of the firm, we can at least know where to look if we want to explain or to predict the actions of particular firms." [Penrose, 1959: 42]. But it was left to Kirzner (1966) to point to a way capital heterogeneity might be handled in the framework of Austrian economics. Kirzner spelled out that capital heterogeneity occurred not because of the objective characteristics of capital assets, but because of the attributes, functions, characteristics, and uses of capital assets that were subjectively perceived by the entrepreneur. By tying attributes to entrepreneurial perception, Kirzner made them depend on the subjective plans, knowledge and expectations of individual entrepreneurs. Therefore, attributes are not givens, but have to be discovered or created through the open-ended play of entrepreneurial action.

Foss et al. (2002, 2007) use these insights to make an important argument about how heterogeneous assets relate to the theory of the firm. In many ways, their argument is in the spirit of incomplete contracting theories of the firm (Grossman and Hart, 1986; Hart and Moore, 1990). After all known attributes of assets have been contracted for, "owners" control the residual decision rights over assets. For Hart and Moore, the value of these residual rights derives from the ability for owners to make adjustments for (currently unforeseeable) contracting hazards. Foss et al. point out that the value of residual rights can also be thought of as deriving from the yet-to-be discovered attributes of assets that might be subject to contracting in the future. Residual decision rights have value precisely because the entrepreneur wishes to be in a position to exploit attributes that he/she judges might be embedded in the asset but are not currently perceived by other economic actors. Because each entrepreneurs' knowledge about the future plans and perceptions of other economic actors is always very imperfect, current contracts (including contingent contracts) only capture a fraction of the potential attributes of assets that might be contracted for if they were to be discovered. This explains why asset ownership (including the ownership of firms, considered as bundles of assets) is an intrinsically entrepreneurial phenomenon (Langlois, 2005) since it suggests that the value of ownership derives in a fundamental way from the entrepreneurial discovery process.

IV: Assessment / evaluation of the three strains in Austrian literature on the firm

In this section of the paper we assess the empirical efficacy of the three Austrian strains above. We are quite aware that many, if not most, Austrians would disagree with this strategy. However, sometimes a confrontation between theory and data is not only useful for testing theory but also for developing new theories and extending established theories into fruitful new territories. Furthermore, we will strive to show that there is a payoff to this particular confrontation between theory and data that even Austrians might find compelling.

On the role of dispersed knowledge in internal organization**,** Austrian themes have been shown to work well in the empirical studies grown out of the work of Simon (1947, 1979, 1993) and colleagues (Cyert and March, 1963). The starting point for Simon's work – bounded rationality – is different from Hayek's notion of dispersed knowledge, but really the

two ideas are so to tightly interlaced (the basic issue being *limited local* knowledge) that it is not at all surprising that together they explain many empirical regularities. For instance, there is little doubt about the ubiquity of routines (standard operating procedures) in organizations of all kinds. Much of the thriving literature on organizational capabilities has its roots in these observations (Nelson and Winter, 1982; Allison and Zelikow, 1999 for a summary; Felin and Foss, 2002 for a critical review; Feldman and Pentland, 2003 for a reinterpretation). Additionally, a substantial body of empirical literature in organization studies addresses the issue of shared cognition (Daft and Weick, 1994; Begley and Boyd, 2001). So, all in all, there exists considerable empirical support for key Austrian insights into internal organization.

In fact, precisely because the literatures on organization and strategy have examined issues related to knowledge in such great depth, the open problem that merits greater consideration is *ignorance*, not knowledge. The notion that some organizational issues may have more to do with the fallibility of our knowledge – i.e. what we do not know rather than what we do know -- is a traditional Austrian theme (Hayek, 1960; 1974) waiting to be further explored, notwithstanding some contributions from mainstream economists (Sah, 1992 for example).

As we noted earlier, making judgments about how to use assets has a big role to play in Austrian theorizing about what is peculiarly entrepreneurial about firms. On this topic, the empirical literature is less supportive. To the extent that judgment involves the use of prediction and planning, judgment was long ago assassinated in the management literature (see in particular Mintzberg, 1994). Economic psychologists have built a veritable industry out of examining flaws in human judgment that deviate from the rational ideal (see Kahneman and Tversky, 1973; Nisbitt and Ross, 1980 and so on). There are also large literatures on overconfidence and overoptimism (Camerer and Lovallo, 1999). In sum, the sheer weight of empirical evidence compels researchers to deem Austrian conceptualizations of entrepreneurial judgment rather unrealistic – a matter of hand-waving rather than thoughtful theorizing or careful observation. It is here that we hope the current paper will make a real contribution to the Austrian conversation.

The argument for the non-contractibility of entrepreneurial services also appears somewhat suspect. Most empirical strategy researchers of corporate entrepreneurship would be surprised to learn that corporate entrepreneurs cannot be paid a salary (Burgelman, 1983; Guth and Ginsberg, 1990; Kuratko et al., 1990). Also venture capitalists, who regularly fire founding entrepreneurs and replace them with hired ones might also balk at this claim (Amit et al., 1990; Gompers and Lerner, 2000), as might scientists who seek to bring an entrepreneur on board to commercialize an invention.

Overall, judgment appears to be a troublesome concept. Again, in our opinion, Austrians might profit more from focusing on the other side of the knowledge coin – on *ignorance* rather than judgment. Roughly speaking, this is the line of reasoning we plan to follow in the rest of the paper. Paradoxical though it may initially appear, we think entrepreneurial reasoning has more to do with decision processes that work well when *ignorance* reigns, than processes that leverage superior judgment, or even just old fashioned prior knowledge (Venkataraman, 1997; Shane, 2000). In our view, entrepreneurial expertise (Sarasvathy, 2007; Dew et al., 2007) embodies procedural knowledge that is 'adaptive' in the absence of substantive knowledge, i.e. in the face of ignorance (Simon, 1978; Hayek, 1960).

Finally, on asset heterogeneity, we might ask whether the process of discovering and creating new attributes of assets has been studied in the literature. Indeed it has. A small but coherent line of work in evolutionary economics has much affinity with the Austrian point of view. Evolutionary biologists and technology historians call this a process of *exaptation* (Gould and Vbra, 1982; Dew et al., 2004). For instance, feathers evolved for one reason (temperature regulation) but were later exapted for another use (flight), i.e. in nature creatures have discovered new uses for pre-existing attributes. According to Dew et al. (2004), exaptation is precisely about the discovery or creation of valuable new uses or new attributes of artifacts that were previously invented or adapted for the value of other attributes. Many empirical examples of exaptation (the quintessential one being the laser) can be found in the work of technology historians such as Basalla (1998), Rosenberg (1996) and Mokyr (1990). By explicitly linking exaptation to Knightian uncertainty, Dew et al., (2004) show that the list of possible attributes of an asset is in principle limitless because we cannot predict all of the context-dependent ways in which some subpart of an artifact might have a novel use in some future situation. Again, the key issue is ignorance: per Foss et al., asset ownership is important not because of what we know (for we can write contracts about that) but because of what we do not and cannot know.

In sum, if we look at the mixed empirical support for Austrian concepts in the theory of the firm, one outstanding issue is the contrast between the realism of asset heterogeneity arguments and the weak empirical support for the concept of judgment. This poses a puzzle: the very sources of asset heterogeneity, namely bounded rationality and limited local knowledge on the one hand and the prolific-idiosyncratic nature of subjective imaginings and individual tastes and preferences on the other, make 'judgment' (defined as the ex-ante ability to make decisions that turn out to be correct ex-post), even assuming there exists such a thing, rather rare and short-lived. Yet, subjective individual judgment consisting in the plans, expectations, alertness and foresight of the entrepreneur is what underpins asset heterogeneity. According to Foss et al. (2006:11), Kirzner's approach defines capital assets

> in terms of subjective, individual production plans, plans that are formulated and continually revised by profit-seeking entrepreneurs. Capital goods should thus be characterized not by their physical properties but by their place in the structure of production as conceived by entrepreneurs.

In other words, contra the careful attention Austrians have in the past paid to process (Hayek, 1978), the present theory of capital assets explains heterogeneity with heterogeneity. And in many ways, it is with the worst kind of heterogeneity: the black box of subjective, continually revised judgments.

We believe we can do better. In this paper we want to entertain the possibility that more satisfactory mechanisms exist for the discovery and creation of new asset attributes that also effectively engender economic organization in the face of dispersed knowledge. The data point to an entrepreneurial *process* that ends up creating heterogeneous assets as well as results in reorganizing markets while concurrently organizing the internal structure of the firm. In the ensuing section we lay out a conceptualization of entrepreneurial judgment that is essentially *procedural*. This conceptualization also leads naturally to a procedural explanation of the *source* of capital heterogeneity.

V: Judgment as the outcome of expertise

We can undertake a simple logical analysis of the role of judgment in the entrepreneurial creation of new firms. We begin by noting two large literatures outside of Austrian economics that take an oversimplified all-or-nothing view of judgment. Neoclassical economics has no role for entrepreneurs since it assumes perfect information. Evolutionary economics trivializes the role of entrepreneurs since it assumes no judgment whatsoever. Individual entrepreneurs merely create random variations on which selection (embodied in evolutionary market processes) acts.

With Knight, Kirzner, Casson and recent Austrian theorizing we come to a more complex and interesting view of judgment – namely that it exists and is an important starting point for economic organization, even when one is unable to specify and explicitly acquire it ex-ante. But, as Table 2 illustrates, the various conceptualizations of judgment do not cohere very well.

< INSERT TABLE 2 HERE >

When Knight first introduced the notion of entrepreneurial "judgment" he referred to it as follows:

> The ultimate logic, or psychology, of these deliberations is obscure, a part of the scientifically unfathomable mystery of life and mind. We must simply fall back upon a "capacity" in the intelligent animal to form more or less correct judgments about things, an intuitive sense of values. We are so built that what seems to us reasonable is likely to be confirmed by experience, or we could not live in the world at all.

This is a little different from Langlois quoted earlier (pp 15):

> Judgment is the (largely tacit) ability to make, under conditions of structural uncertainty, decisions that turn out to be reasonable or successful ex post.

And patently different from Casson (2007:):

> [T]he key trait of entrepreneurship [is]… judgment in decision making. Judgment is a capacity for making a successful decision when no obviously correct model or decision rule is available or when relevant data is unreliable or incomplete."

So there are two broad sets of possibilities here. Either judgment is something all of us have a la Knight and entrepreneurship is simply a matter of some people having the courage to act on their judgment even in the absence of clear foresight about consequences; or it is something some people are deemed to have a la Kirzner's alertness hypothesis or Casson's knowledge asymmetry. In either case, if this judgment is *tacit* – i.e. the entrepreneur does not know ex ante whether he or she has it, we have to come to grips with two types of possible errors:

- Either the entrepreneur believes he has the judgment when in actual fact he hasn't. This leads to overconfidence, hubris and over-entry. There is considerable evidence that human beings in general and entrepreneurs in particular are prone to these biases.
- Or the entrepreneur believes she does not have the judgment when in actual fact she has it. This leads to unjustified risk aversion, under-confidence and underinvestment in

entrepreneurship. Evidence for this comes from non-US economies such as Germany where failure avoidance is high (cites) and developing nations such as Bangladesh where entrepreneurs like Yunus have to launch concerted campaigns to get people to start micro-ventures so they can (presumably) learn about and leverage their entrepreneurial judgment.

No matter what the *empirical* efficacy of the arguments above, *theoretically* speaking, both individual entrepreneurs and the researchers who study them are forced to proceed *as-if* there exists an ex-ante judgment (whether it is knowable only ex-post or not). The notion of 'judgment' therefore becomes reified as a necessary condition for entrepreneurship to happen. At the extreme, scholars are pushed into tautological corners such as Casson and Wadeson, 2006:6:

> Overall, a good entrepreneur, with good judgment, will tend to select good projects, whilst a bad entrepreneur, with bad judgment, will select bad projects. Of course, given the prohibitive cost of collecting full information, there will always be residual uncertainty; good judgment shortens the odds, but does not guarantee success. The new projects promoted by a good entrepreneur will tend to be true opportunities, whilst the projects promoted by a bad entrepreneur will be false opportunities – i.e. projects that appear promising to people who use over-simplified theories and poor information. Investing in false opportunities represents a waste of resources because the opportunities do not belong to the optimal project portfolio. The key to entrepreneurial success is to possess sufficient judgment to recognise true opportunities and screen out false ones.

If we are to develop realistic and useful micro-foundations that cohere well with Austrian insights about the creative nature of market process and subject to evolutionary selection at the macro level, while at the same time not vacuously collapsing into random variations or mystical intuitions at the level of individual entrepreneurs and their stakeholders, we need to look at judgment neither as an unfathomable black box nor as an idiosyncratic attribute of individuals that simply cannot be divined ex ante.

Instead, in a series of studies informed by methods from cognitive science, we have been looking at entrepreneurial judgment as a form of *expertise* – i.e. teachable and learnable elements with an internally consistent logic that we call effectual logic. Effectual logic, it turns out, works *even-if* judgment does not exist or cannot be known ex ante. Furthermore, the logic is inherently dynamic and interactive. Effectual logic embodies a procedural rationality that sets in motion a process of interactions of individual entrepreneurs with their environments – physical, social, political, economic, institutional and interpersonal. In the next section, we present a concise outline of effectual logic drawn from our previous empirical work.

Effectual logic

Effectual logic was inductively derived from two empirical studies. Sarasvathy (1998) used think-aloud protocols to examine the cognitive processes used by expert entrepreneurs in making decisions in the new venture creation setting. Dew (2003) used a historical and qualitative approach to the development of a new industry – Radio Frequency Identity (RFID). Since then, several studies comparing expert entrepreneurs with novices

(Dew et al., 2007), corporate managers, organic growth leaders, angel investors (Wiltbank et al., 2007), and venture capitalists across countries, have begun cumulating evidence leading to the following stylized facts:

1. Expert entrepreneurs use effectual logic significantly more than both novices and corporate managers. There are also significant differences between the three groups on specific principles, breadth and depth of the use of causal and effectual logics.
2. Organic growth leaders, unlike corporate managers in general, appear to be closer to expert entrepreneurs in their use of effectual logic.
3. While venture capitalists in general are significantly less likely to use effectual logic, the more experienced they are, the closer they come to expert entrepreneurs in their use of effectual logic.
4. Angel investors who more widely used specific effectual strategies experienced a reduction in investment failures without any compromise in success rates.

A variety of published articles and book have explicated the logic in depth. Key theoretical elements of effectual logic were laid out in Sarasvathy (2001); the dynamics were worked out in Sarasvathy and Dew (2005) and connections to strategic management theories were worked out in Wiltbank et al. (2006). For a complete theoretical treatment of the logic in detail, see Sarasvathy (2007). We provide below a brief summary of the logic in order to draw out its implications for an Austrian view of the theory of the firm. The summary is graphically encapsulated in Figure 1.

< INSERT FIGURE 1 HERE >

Expert entrepreneurs do not necessarily begin with an opportunity or market research. Instead, they start with who they are, what they know and whom they know. These are their primary means. What they have – i.e. capital assets, is a function of their identity, knowledge and networks. As we will see in the elaboration of the process, these assets will fluctuate in their value as they get invested, manipulated, combined with others and transformed into unprecedented new possibilities.

Expert entrepreneurs may or may not begin with a clear vision for a new venture. Instead their entrepreneurial strategies are predominately means-driven and *result* in new ends embodied in goals and subgoals that are usually characterized by specific *courses of action* rather than outcome variables. Expert entrepreneurs are as likely to see entrepreneurship as an instrument to achieve non-economic goals (such as attaining a preferred lifestyle or solving societal problems such as environmental degradation) as they are to see an entrepreneurial career itself or making money per se as the predominant goal for starting their ventures.

Almost the first thing expert entrepreneurs do in transforming their means into new ends is to start interacting with potential stakeholders. However, they do not always seek out specific stakeholders and try to sell them on a preconceived vision of the opportunity – as noted earlier, in many cases they do not even have any such vision to begin with. Indeed, the stakeholder acquisition process in effectuation inverts conventional wisdom on bringing people on board a new venture. It is more a process of stakeholders *self*-selecting into the venture rather than entrepreneurs masterminding a chase for the "right" people. Instead the

skill of the entrepreneur lies in his or her ability to stitch together a valuable venture from a variety of real commitments from a number of self-selected stakeholders, each of whom may have a different conception of the venture and the particular uses to which the assets they bring on board may be put to.

Since effectual entrepreneurs' strategies are predominately means-driven and the whole point of the process is to create new ends (embodied in new business models, new product and product-markets as well as new ventures and organizations), anyone who commits real resources to come on board gets to shape the goals and direction of the venture to the extent of their commitment. Preset goals and preconceived visions do not determine the criteria for who comes on board and what their value is to the firm, just as preset goals and visions do not determine the value of assets invested in the firm – instead it is the particular ways in which the assets get used to create new ends that end up determining what their *negotiated* worth turns out to be. Furthermore, while each self-selected stakeholder may or may not be motivated by what she may stand to gain, she invests only what she can afford to and is willing to lose.

It is this means-driven *process* of self-selected stakeholder negotiations based on subjective and intersubjective assessments of affordable loss – if and when continued unaborted over a sufficient period of time -- that concurrently determines the structure, scope, bounds and organizational texture of new ventures and new markets.

Whereas what any new economic organization of firms and industries will eventually turn out to be is unpredictable at the beginning of the effectual process, the process itself embodies a clear logic with precise principles and guidelines that drive the decisions of individual entrepreneur-stakeholders. This procedural logic is teachable and learnable; it minimizes the use of prediction; it leverages surprises and inherent heterogeneities in means and capabilities; it is strongly antithetical to central planning and practically (not merely ideologically) nurturing of individual freedom and creativity. And in the final analysis, it is definitely *not* tautological.

VI: Implications

In two recent instances where Sarasvathy (2001) has been cited in Austrian articles (Chiles et al., 2007:18; Foss et al., 2006:13), both comment that effectuation takes entrepreneurial means as 'givens'. Both articles therefore miss the point of effectuation, which is a logic that drives the process by which entrepreneurs transform existing artifacts into new artifacts (Sarasvathy and Dew, 2005). The root of this confusion appears to be simple: both Chiles et al. and Foss et al. confuse the assets entrepreneurs acts on – i.e. what they *have* with the entrepreneurs' means – namely who they are (tastes, traits, abilities), what they know (education, experience-based and other types of prior knowledge) and whom they know (social and professional networks). Capital assets are artifacts in the world that are a function of the entrepreneur's means. In other words, what any given entrepreneur sees as the valuable possibilities inherent in any given asset depends on who s/he is, what s/he knows and whom s/he knows. Furthermore, since effectual entrepreneurs often do not know and need not imagine the particular new artifacts that they actually end up creating, there is no assumption whatever in effectuation as to the "given" nature of capital assets. When we say effectuators take means as 'given" all we mean is that they work with what is readily

available and do not necessarily go searching for the "right" resources for building their venture. Instead they continually imagine new uses of old assets and furthermore they put a variety of stakeholder imaginations to work, and as we know from creativity studies, more heads are indeed better than one in resulting in path breaking innovations (Conrath, 19xx; Amabile, 19xx).

Therefore, contra what Chiles et al. and Foss et al. both appear to suggest, effectuation does not at all embrace a neoclassical view that assets come in pre-defined form. Quite the opposite. In fact, we have argued in several different ways that assets are infinitely definable (Sarasvathy and Dew, 2004; Dew et al., 2004). Moreover, any given asset can be used to define, transform and redefine new *ends* in infinite ways too. In our view, to borrow Buchanan's evocative phraseology, the market begins as a 'game without goods' not with them (Buchanan and Vanberg, 1990). Thus, as outlined in Sarasvathy et al. (2003), Sarasvathy and Dew (2005) and Sarasvathy et al. (2007), effectuation has an affinity with "creative" views of the market process, epitomized by the work of Shackle (1979) and Buchanan (Buchanan and Vanberg, 1990). Or, as Chiles et al. remark (2007:34): "Sarasvathy's economic approach to entrepreneurship is decidedly Lachmannian."

As our explication in the previous section shows, effectual logic coheres well with Austrian insights that assets do not come with pre-specified attributes and hence are not objectively valuable ex ante. Instead, capital assets and even what counts as capital is determined within and through an intersubjective process that involves imagining, leveraging, redefining, manipulating and transforming any and all materials at hand (Hark back to the case of the Post-It note described at the beginning of this paper). In a trivial sense *everything* can potentially count as an asset. Yet, the process of *transforming anything* into an asset is non-trivially related through effectual logic to multiple stakeholder interactions, contingencies and market *creation* not merely to market *discovery.* Judgment in this conceptualization is not a *thing,* not an attribute of individuals, but the cumulative residual of a dynamic and interactive *process,* the activation and fostering of which in itself can be precisely and simply specified. The elements of effectual logic are ready-for-use by cognitively bounded creatures whose foresight and insight are both far from omniscience. Yet it neither consists in the blind groping of random acts of wishful thinking, nor does it involve an "unfathomable mystery of life and mind" as Knight posited it would.

The key point of difference from Austrian approaches, however, is that effectual logic provides a much larger role for stakeholders beyond the individual entrepreneur. In fact, the founding entrepreneur is but one stakeholder in the effectual process. On the one hand, this might go against the grain of the strong methodological individualism inherent in the Austrian view. Yet, effectual logic highlights the fact that the market process is a *market* process even at the most micro level of analysis. Effectual stakeholders are less likely to play a game of follow-the-charismatic-leader and more prone to negotiate real (not merely financial) equity stakes in shaping vision and venture. In any case they *self-select* into the process and pay a *price* (in the form of a pre-commitment) to self-select. In this sense, every effectual transaction is a market transaction. Whether it is a straight transaction where the stakeholder is buying the "vision" that the entrepreneur is selling and seeking only to influence its execution, or whether it is a completely counterfactual transaction where the stakeholder is buying an option to shape that vision itself, the heart of the effectual process is a negotiated *market* transaction. No coercion, no fiat and in truly effectual cases, not even a hard sell.

A growing body of empirical and theoretical work has begun to show how effectual logic could be an effective driver of new venture creation as well as the creation of new markets. Yet the interactive and counterfactual nature of the effectual process makes its role in economic organization a bit more nuanced and complex than the standard Austrian view. Effectuation leverages individual imagination, but leaves room for and in certain cases highlights the importance of cooperative action in the creation of enduring firms and hierarchical coordination in keeping them going. But the way forward with effectual cooperation and coordination is mostly the way of Amartya Sen's solution to the social choice problem – i.e. a leveraging of individual freedoms and capabilities to choose ends as well as means and to voluntarily and strenuously take "other minds" into account in making those choices (Sen, 19xx). Effectual entrepreneurship is social choice within the market process. But it is a social choice that at once eschews concerted collective action and monodic Walrasian auctioneering. Instead it is an inter-subjective transformation of old local realities into growing new possibilities that carry within them the potential for wide-ranging changes that show up ex-post as Schumpeterian disequilibria at times and Kirznerian equilibria at others.

Finally, a word on the behavioral aspects of effectuation. Earlier in the paper, we showed that any conception of ex-ante judgment is prone to Type I and Type II errors leading to overconfidence or underinvestment. The empirical jury is still out on these problems with regard to effectual strategies. In the meanwhile we offer the following hypothesis about how effectual logic explicitly trades off these errors against each other. On the one hand, it may be that effectual logic leverages over confidence and encourages over-entry, but by focusing on affordable loss, it limits and perhaps encourages under-investment in early stages – keeping costs of failure low for entrepreneur (spread over stakeholders) and economy.

VII: Conclusion

Entrepreneurial judgment in its conventional form is in fact neither necessary nor sufficient for effectual entrepreneurship. But if such judgment actually does exist, effectual logic can leverage it as well. In this sense, effectual logic provides sufficient, even if unnecessary conditions for economic organization of both markets and firms.

Table 1: literature summary

Internal Organization	Entrepreneurial Judgment	Heterogeneous Assets
Hayek, 1937, 1945	Knight, 1921	Lachmann, 1956, Kirzner, 1966, 1996
Minkler, 1993 Tsoukas, 1996 Sautet and Foss, 1998 Sautet, 2000 Foss and Klein, 2001, 2007 Foss, 1997, 1999, 2001 Foss & Foss, 2006 Ioannides, 1999, 2003, 2006 Dulbecco and Garrouste, 1999 Foss and Christensen, 2001	Boudreaux and Holcombe, 1989 Langlois and Cosgel, 1993 Langlois, 2002, 2005a, b Foss, 1994 Foss and Klein, 2005 Foss, Foss & Klein, 2006 Loasby, 2004 Casson, 1982, 2005 Witt, 1998, 1999, 2003, 2007 Alvarez and Barney, 2005	Foss, Foss and Klein, 2002, 2006 Foss & Foss, 2005 Lewin, 2005 Chiles et al., 2007
Other papers / uncategorized		
Adaman and Devine, 2000 Adelstein, 2005 Kapás, 2003 Lewin and Phelan, 2000 Mathews, 2006 Roberts and Eisenhardt, 2003 Vihanto, 1992 Yu, 1999		

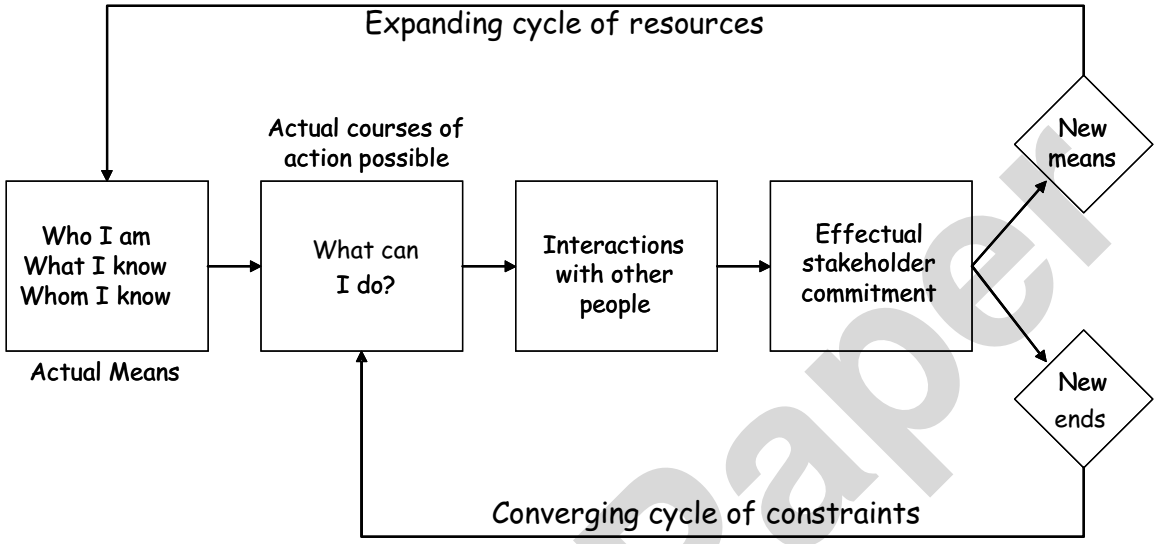
Table 2

Definitions: Entrepreneurial Judgment

Langlois, 2005b:13	"Judgment is the (largely tacit) ability to make, under conditions of structural uncertainty, decisions that turn out to be reasonable or successful *ex post*."
Casson, 2005:329 Ultimately, Casson's concept of judgment is ex post. It is also an empty black box because he reduces judgment to being in possession of *information* that turns out to be correct.	"Judgmental decision making involves an element of improvisation rather than exclusive reliance on routines. It makes use not only of publicly available information but also of private information available only to a few. The exercise of judgment involves the synthesis of all this information…" "Superior judgment stems from privileged information (that is substantially correct)…
Casson, M.C., 2007. The concise encyclopedia of economics Note that here Casson defines judgment in 2 different ways: a). as ad hoc decision making b). used when data in unreliable or incomplete. However, he assumes the relevant data can be known (i.e. does not assume isotropy).	[T]he key trait of entrepreneurship [is]… judgment in decision making. Judgment is a capacity for making a successful decision when no obviously correct model or decision rule is available or when relevant data is unreliable or incomplete." "Cantillon's entrepreneur needs judgment to speculate on future price movements, while Knight's entrepreneur requires judgment because he deals in situations that are unprecedented and unique. Schumpeter's entrepreneur needs judgment to deal with the novel situations connected with innovation."
Casson. M.C. and Wadeson, N., 2006:3 The Discovery of Opportunities: Extending the Economic Theory of the Entrepreneur – working paper.	"[E]ntrepreneurship studies the behaviour of individuals who specialise in making choices that require intensive use of judgment – *i.e*. choices that involve unprecedented situations in which different people are likely to make different decisions." (Casson, 1982).

Foss, Foss and Klein, 2007:4 Original and Derived Judgment	"Judgment refers primarily to business decision-making when the range of possible future outcomes, let alone the likelihood of individual outcomes, is gen-erally unknown (what Knight terms uncertainty, rather than mere probabilistic risk)."
Boudreaux and Holcombe, 1989:151 Do not define judgment directly but relate it to the non-existence of markets, and therefore the absence of information.	"Entrepreneurial judgment is the real-world substitute for the hypothetical perfect foresight exercised by producers in static equilibrium models… Market prices provide information only if markets already exist… New goods can only be produced on the basis of entrepreneurial judgment."
Schumpeter, 1934:85 (Cited by Langlois, 2005: 13) Ex post definition	Entrepreneurship "depends on 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."
Loasby, 2004:4 Uses the word "intelligence" rather than judgment. Loasby points to isotropy (knowing what's relevant, what to ignore) as well as uncertainty.	"Profit, firms, and entrepreneurship, Knight argued, all depended on uncertainty, defined as the absence of correct procedures for dealing with a range of possibilities. We may add to this the absence of correct procedures for defining the range of possibilities, so eloquently emphasised by George Shackle."

Figure 1
Effectual Process (Sarasvathy and Dew, 2005:543)



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