Constructing corridors to economic primitives:
Entrepreneurial opportunities as demand-side artifacts

Saras D. Sarasvathy
4548 Van Munching Hall
R.H. Smith School of Business, University of Maryland
College Park, MD 20742
Phone: (301) 405-9673
Email: saras@rhsmith.umd.edu

Acknowledgments:
I am very grateful to Venkat (S. Venkataraman) for his active support and intellectual engagement in my ideas, even when they take on a distinctly critical flavor. Several of the ideas in this paper in particular have been honed due to his seminal inputs. I would like to thank Nick Dew, Stuart Read, and Rob Wiltbank for ongoing conversations; and Anil Menon for useful comments on an earlier version of this paper. Hallway conversations with Per Davidsson, Bill Gartner, Benyamin Lichtenstein, and Dean Shepherd have also contributed to my thinking on this subject.

Abstract

The idea is to model entrepreneurial opportunities as pathways to the edifice of economic primitives such as preferences, demand functions, production functions, and so on -- things that economic theory typically takes as "given". This means that entrepreneurial endeavors can start in non-economic spheres and entrepreneurs construct "corridors" as it were from these pre-economic realities to economic artifacts such as new firms, new markets, and even new utility functions. The essay draws upon the open-universe philosophy of pragmatism and the more concrete "social science" arguments of Simon's *Sciences of the artificial*. I connect the two threads of arguments to specific examples and current empirical work in entrepreneurship. I also examine implications for entrepreneurship research and economic development policy.

1. Introduction

The thesis of this chapter is simple. What economics and other social sciences take as *given*, the entrepreneur actually *constructs*. Entrepreneurial opportunity, therefore, is the opportunity to construct new markets. I will attempt to show that this thesis holds whether we define a market as a set of psychological needs and preferences (such as Maslow's hierarchy); or economic structures of an industry such as demand functions, competitive landscapes, and exchange transactions; or socio-political institutions such as property rights, standards bodies, as well as rules and routines that govern interactions between human beings.

The entrepreneur, like any other human being, comes onto the world stage in the middle of a drama already in progress. And like any other human being, the entrepreneur too is constrained and shaped by the socio-economic and psycho-historic forces that prevail at the moment of his or her advent upon the stage. Yet, like engineers who understand that the laws of physics constrain, but do not *determine* their designs (Simon, 1996), entrepreneurs do not allow the constraints imposed by their environments to determine the organizations they design. Instead, using those very constraints as their raw material, they re-invent and even fabricate from scratch, environments within which they live, work, and play. Not all their designs work well, of course. That does not detract from the thesis that they do design many components of the environments we live in. Entrepreneurs are radical actors. They implement what Marx meant when he said, "The philosophers have only interpreted the world in various ways; the point, however, is to change it" (Source: *Theses on Feurbach*)

Considerable evidence for this thesis comes from early stage histories of new organizations built by entrepreneurs. The data -- anecdotal, archival, and otherwise -- show that most entrepreneurial activities originate in the ordinary business of human life. But through the

organizations they build, entrepreneurs construct corridors from what William James called "the blooming buzzing confusion" of ordinary life to the various primitives that the social sciences take as givens in their analyses of markets.

2. Schumpeter and beyond: Questioning the existence of markets

Following Schumpeter (1934), entrepreneurs have come to be seen as innovators. Schumpeter identified five types of "new combinations" that we now identify as constituents of entrepreneurial innovation:

(1) The introduction of a new good – that is one with which consumers are not yet familiar – or of a new quality of a good.
(2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which by no means need be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially.
(3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before.
(4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created.
(5) The carrying out of new organization of any industry, like the creation of a monopoly position (for example through trustification) or the breaking-up of a monopoly position.

Of these, all except (3) have come to be identified with Schumpeterian entrepreneurship. Economists and strategic management theorists study supply side innovations including technological innovation, development of new products and processes as well as new sources of supply. Industrial organization and population ecology scholars focus on the origin and evolution of new industries. But even though Schumpeter was careful to emphasize the creation of new markets in statements such as, "It was not enough to produce satisfactory soap, it was also necessary to induce people to wash." (1939: 243), entrepreneurial creation of new markets has mostly been neglected.

Main stream economists, for example, simply assume the market as exogenous to their analyses. As Olson and Kahkonen (2000: 1) put it, "The fourth primitive of economic thought –

and of most lay thinking on economics – is so elemental and natural that it is usually not even stated explicitly or introduced as an axiom in formal theorizing. It is the half-conscious assumption that markets are natural entities that emerge spontaneously, not artificial contrivances or creatures of governments." Similarly, Arrow (1974) observed, "Although we are not usually explicit about it, we really postulate that when a market could be created, it would be."

Sociologists too have sought to explain the origin and evolution of markets in a variety of ways. But their definitions of the concept are telling. Take, for example, the classic article by Harrison White (1981: 518):

> What I have proposed is embedding economists' neoclassical theory of the firm within a sociological view of markets. Markets are self-reproducing social structures among specific cliques of firms and other actors who evolve roles from observations of each other's behavior. I argue that the key fact is that producers watch each other within a market….
> … Markets are not defined by a set of buyers, as some of our habits of speech suggest, nor are the producers obsessed with speculations on an amorphous demand. I insist that what a firm does in a market is to watch the competition in terms of observables.

More recently, Neil Fligstein (2001: 31) wrote:

> A market is a social arena where sellers and buyers meet. But for sellers and buyers to exist, a product has to exist and someone has to produce it. A market depends on the buyers continuing to "show up" in a particular social space to purchase the product. But the sellers' firms and their status relations define what stability means in the market. They define what the market is about, and their relations define the local culture by which money is to be made and stability produced.

This continuing focus on supply-side innovations and institutions in economics and sociology colors how entrepreneurship scholarship looks at entrepreneurial opportunities. Scholarship informed by psychology and management appears to fare slightly better. In this stream, several scholars and bodies of literature attest to the endogenous nature of supply and demand in economic processes. Examples include Stigler and Becker (1977), Hirschman (1985), Carpenter and Nakamoto (1989). Much scholarship in evolutionary economics, with its roots in the Carnegie School's development of behavioral and cognitive approaches, has been motivated

by similar observations. This stream has sought to build a picture of technological change in the supply of products that is consistent with empirical observations of the origination and evolution of markets over time (Nelson and Winter 1982). This stream has also sparked a variety of studies on technology "push" and "pull" – supply-side and demand-side influences on the evolution of technology regimes. For an excellent review of the issues, see Dosi (1982).

A theory of the creation of demand for products and services must be similarly consistent with empirical observations about the origin and evolution of markets and recognize the interdependence between production and preference formation (Gualerzi 1998). In other words, demand theory must reflect the new opportunities for consumption that are created by new sources of supply. This interaction between endogenously created supply and endogenously created demand is an important issue in our understanding of the role of new markets and, indeed, the nature of competition itself.

The key idea here is that while individuals have abstract aspirations, there are diverse and plural ways in which these aspirations can be fulfilled (Lancaster, 1971). And what makes this even more complex is that these aspirations can themselves change over time as the individual learns and interacts with other individuals. Aspirations do not in themselves entail any single or inevitable set of "demands" in the conventional economic sense. Instead, individuals have only a very rough idea of their consumption goals. For example, the fact that people experience hunger does not imply a demand for hamburgers, let alone a "market" for the hamburger supplied by any particular fast food chain or restaurant. I would therefore argue that the transformation of an abstract aspiration such as hunger into particular market niches for particular foods ought to form a key topic in entrepreneurship research.

3. Beyond Kirzner: Questioning the existence of opportunities

Entrepreneurship researchers do acknowledge that the phenomena of primary interest to entrepreneurship, namely opportunities, occur in the absence of markets (Venkataraman, 1997). Although traditionally research has mostly been focused on (a) the attributes of entrepreneurs and (b) success factors related to new venture performance, more recently, the main focus of the field has shifted to the study of entrepreneurial opportunities (Busenitz et. al, 2003). The intellectual roots of this growing interest in entrepreneurial opportunities can be traced not only to Schumpeter (1934), but also to Kirzner (1973), which Venkataraman (1997) deemed the strong and weak form, respectively. In a nutshell, the Schumpeterian entrepreneur disrupts equilibrium through her innovation; the Kirznerian entrepreneur is alert to disequilibria and works to bring the economy back to equilibrium. Aldrich (1999) and Shane (2003) have pointed out that most entrepreneurial opportunities are likely to be Kirznerian, rather than Schumpeterian.

What are entrepreneurial opportunities? Are they phenomena to be explained by entrepreneurship research, or are they taken as givens in our analyses of what entrepreneurs do and how well entrepreneurial firms perform? Currently, the majority of approaches seems to suggest the latter. For example, Shane and Venkataraman (2000: 220) use Casson's definition of entrepreneurial opportunity and state:

> To have entrepreneurship, you must first have entrepreneurial opportunities. Entrepreneurial opportunities are those situations in which new goods, services, raw materials, and organization methods can be introduced and sold at greater than their cost of production (Casson 1982). Although recognition of opportunities is a subjective process, the opportunities themselves are objective phenomena that are not known to all parties at all times. For example, the discovery of the telephone created new opportunities for communication, whether or not people discovered those opportunities.

Shane (2003: 18) extends this definition as follows:

> I define entrepreneurial opportunity as a situation in which a person can create a new means-ends framework for recombining resources that the entrepreneur *believes* will yield a profit.

This definition has its problems, just as the definition of core concepts in *any* major field of inquiry does. Take for example the notion of "mass" in physics; "life" in biology; "resources" in strategy; or "market" in the social sciences. Without going into a criticism of definitions of entrepreneurial opportunity, I wish to note only that, as in the case of markets in the social sciences, entrepreneurial opportunity is mostly taken as a *given* in our scholarship so far[1].

Just as the neoclassical entrepreneur (i.e. the producer) seeks to fulfill current and/or latent demand and capture market share, and the sociological/evolutionary entrepreneur seeks to adapt to and survive within extant markets, the Schumpeterian and Kirznerian entrepreneur seeks to recognize, discover, explore and exploit *given* opportunities. In fact, Shane (2003) identifies several sources for both types of opportunities that pre-exist the actions of the entrepreneur. Schumpeterian opportunities, he argues, arise out of technological, political/regulatory, and social/demographic changes; Kirznerian opportunities are largely idiosyncratic, and arise out of the errors and omissions of prior decision makers that cause surpluses and shortages.

Kirzner, notably, has a more complicated position as to the existence of opportunities and the entrepreneur's role in discovering them (1979: 8):

> Entrepreneurial knowledge is a rarefied, abstract type of knowledge – the knowledge of where to obtain information (or other resources) and how to deploy it.
>
> This entrepreneurial alertness is crucial to the market process. Disequilibrium represents a situation of widespread ignorance. This ignorance is responsible for the emergence of profitable opportunities. Entrepreneurial alertness exploits these opportunities when others pass them by. G. L. S. Shackle and Lachmann emphasized the unpredictability of human knowledge, and indeed, we do not clearly understand how entrepreneurs get their flashes of superior foresight. We cannot explain how some men discover what is around the corner before others do.

[1] In all fairness, Venkataraman has co-authored a paper with me that is one of the exceptions (Sarasvathy, Dew, Velamuri, and Venkataraman, 2003)

From empirical investigations into the cognitive processes used by expert entrepreneurs to build new and lasting firms, I am persuaded that the answer to Kirzner's mystery is that entrepreneurs generally do *not* have any "flashes of superior foresight." Instead, as evidenced in Sarasvathy (2001), Sarasvathy and Kotha (2001), and Dew (2002), expert entrepreneurs use non-predictive modes of reasoning and action that construct the so-called opportunity through a process of effectual interaction with stakeholders (See Figure 1 for a graphical depiction of this process and a verbal elaboration of it in Section 6 below). In other words, entrepreneurs often behave as though the opportunity is a *result* of their action rather than a precursor to it.

4. If markets and opportunities are not *assumed to exist*, what do we assume instead?

If we do not begin our scholarship taking either markets or opportunities as already existing or latent in society, where do we begin our analyses? There are two ways to approach this question. I will first lay out the philosophical argument in brief and then quickly move to mundane empirical reality for useful answers.

If we take as our starting point, existing theories such as the neoclassical economic framework, or its forefather, the philosophy of rational choice, we will of course have to *explain* entrepreneurial activity or effectual reasoning as *deviations* from received wisdom. This would be akin to explaining Einstein's theory of relativity as a deviation from the Newtonian model. The more useful way adopted by physicists is to view Einstein's model as the more general one from which Newton's model can be derived as a special case. Here, in the spirit of Popper (1963), I would like to make the "bold" conjecture[2] that entrepreneurship similarly generalizes economics. In other words, economics and the social sciences connected with it study those

[2] Popper on the falsificationist approach: "I can therefore gladly admit that falsificationists like myself much prefer an attempt to solve an interesting problem by a bold conjecture, even (and especially) if it soon turns out to be false, to any recital of a sequence of irrelevant truisms. We prefer this because we believe that this is the way in which we can learn from our mistakes; and that in finding our conjecture was false we shall have learnt much about the truth, and shall have got nearer the truth." (Conjectures and Refutations, 1963)

particular cases where the market has already been created, or where industries/competitive landscapes already exist. Entrepreneurial opportunity, in this view, has to be the opportunity to create the primitives that these sciences take as given. The primitives, as listed at the beginning of this chapter include, among other things, preferences, demand functions, competitive landscapes and socio-political institutions.

In my view, entrepreneurial opportunities begin where everything of importance in human affairs begins – in the "world of pure experience" that William James (1996 [1912]) embraced and sought to understand. In this world, knowledge is never completed, and opportunities are always in-the-making, for as Jamesian pragmatism would have it, the universe itself consists of worlds-in-the-making. In James' vivid rhetoric (1996: 69):

> *To continue thinking unchallenged is, ninety-nine times out of a hundred, our practical substitute for knowing in the completed sense*. As each experience runs by cognitive transition into the next one, and we nowhere feel a collision with what we elsewhere count as truth or fact, we commit ourselves to the current as if the port were sure. We live, as it were, upon the front edge of an advancing wave-crest, and our sense of a determinate direction in falling forward is all we cover of the future of our path. It is as if a differential quotient should be conscious and treat itself as an adequate substitute for a traced-out curve. Our experience, *inter alia*, is of variations of rate and of direction, and lives in the transitions more than in the journey's end.

In other words, opportunities are *made*, as well as found; and as empirical evidence shows, they are perhaps much more the *outcomes* of what entrepreneurs do than the data based on which entrepreneurs act. This view of action itself as a root cause of novelty in the world, as opposed to action as mere implementation of creative thought (Kirzner's "flashes of superior foresight" being an example of creative thought) is endorsed by recent developments in social philosophy. Joas (1996) for example, argues in great detail to generalize the theories of social action to include creative action, with rational action being a special case where assumptions of corporeality, situation, and sociality hold. He questions the wisdom of modeling creativity as mere deviations from rationality:

> Just as fixating on an enemy affects an individual as profoundly as does emulation of a role model, so too, sociological action theory is permeated with the theory of rational action precisely because it sees types of action only as gradations of deviation from rationality in the full sense of the concept and not a unique phenomena in their own right.
>
> The question is whether this picture actually agrees with the facts. (1996: 35)

To the extent that entrepreneurial action is a form of creative action, it can be modeled as a more general form of action than rational economic action based on Joas' framework, as well as within those of other pragmatist philosophers such as Rorty's exposition of the *strong poet*, and Goodman's *ways of world making.* In sum, when we put together relevant ideas from pragmatists such as James, Dewey, Rorty, Goodman, and Davidson, we are led to the necessity of beginning our understanding of entrepreneurial opportunities in the mud of common human experience. And it is my contention that such an analysis will lead us to the conclusion that these opportunities are a *result* of the efforts of particular entrepreneurs striving to construct corridors from their personal experiences to stable economic and sociological institutions that comprise organizations and markets we see in the world. We can easily see this if we ask ourselves, *"How do people become entrepreneurs?"* instead of the more traditional question, *"Why do some people become entrepreneurs, while others do not?"* or its corollary *"Why do some perceive entrepreneurial opportunities and act upon them, when others do not?"*

The following is a rough taxonomy of the ways in which people become entrepreneurs:

Habitual entrepreneurship:

Some people whose parents are entrepreneurs decide either to carry on with the family business, or become entrepreneurs in their own right. This is in line with any other profession – and tends to be more pronounced in more traditional societies such as India, where there is a distinct merchant/business caste or class. In more modern societies such as the US, even children of non-entrepreneurs become entrepreneurs because of early experiences such as a

successful newspaper route (Joe O'Donnell, founder of Boston Concessions) or selling garbage bags door to door as a twelve-year old (Mark Cuban, founder of Broadcase.com and owner of the Dallas Mavericks).

Necessity entrepreneurship:

There is an itinerant relationship of trade-offs between the labor market and entrepreneurial ventures. People get fired from their jobs and become entrepreneurs. Or they quit their jobs because the parent company decided not to commercialize their ideas and inventions (See history of the disk drive industry in Christensen and Bower, 1996). Some people are simply unhireable, say, due to lack of education and requisite language skills (immigrant entrepreneurs for example) or criminal backgrounds (drug lords and protection racketeers, for example), and so become entrepreneurs.

Incentivized entrepreneurship:

Sometimes individuals are induced to become entrepreneurs. Governments in almost every country today offer seed money and other incentives to induce local citizens to start firms and commercialize government-owned technologies (e.g. Batelle National Labs' Entrepreneurial Leave Program). Microfinance organizations, as well as non-profit international aid organizations, governmental and non-governmental, also cajole and/or strong-arm a variety of natives in many developing countries to start ventures or become self-employed. Increasingly, business schools offer entrepreneurship as a career choice, collaborating with and even co-founding incubators for which they provide a steady pipeline of new entrepreneurs.

Celebrity entrepreneurship:

Some individuals are fortunate enough to experience extra-ordinary success in their chosen professions. They then decide to found for-profit and/or non-profit organizations to

create pathways for the less fortunate to find their way to financial independence. Examples abound from show business (Jodi Foster's Egg Pictures, Newman's Own sauces), professional sports (Magic Johnson's theaters), and other areas of the limelight (Oprah Winfrey's plethora of initiatives).

Social entrepreneurship:

People who face extra-ordinary misfortunes too become entrepreneurs. Some social entrepreneurs such as Candy Lightner, who founded *Mothers Against Drunk Driving* after losing her child in a DUI accident, and Sharon Daugherty founder of *Innermotion*, who uses dance to rehabilitate victims of sexual abuse through, are cases in point. Other social entrepreneurs such as Peter Cove, who founded the for-profit firm *America Works* to move welfare recipients into the work force, also attest to the fact that entrepreneurship (for-profit, non-profit or hybrid) is an effective way to solve problems in society.

Entrepreneurship has heretofore been seen as the result of people *perceiving* an entrepreneurial opportunity; I would like to argue instead that entrepreneurial opportunities are predominately the result of people acting in entrepreneurial ways, some of which includes acting upon perceived opportunities. So what does it mean to act entrepreneurially? I turn to that question next.

5. Beyond Schumpeter and Kirzner: Simon's notion of the "artifact"

To act entrepreneurially means to act as though the market is an artifact that results from human action and interaction. In other words, acting entrepreneurially involves *not* thinking of new markets either as natural forces, or as adaptive landscapes – both of which may be predictable to varying degrees, ranging over a very large swathe of the continuum of uncertainty. Instead, as Figure 1 shows, entrepreneurs realize that particular environments are artifacts of

interactive human design. This view coheres with Simon's arguments that environments are increasingly *artificial*:

> The world we live in today is much more a man-made, or artificial, world than it is a natural world. Almost every element in our environment shows evidence of man's artifice. The temperature in which we spend most of our hours is kept artificially at 20 degrees Celsius; the humidity is added to or taken from the air we breathe; and the impurities we inhale are largely produced (and filtered) by man… …One may object that I exaggerate the artificiality of our world … I shall plead guilty to overstatement, while protesting that the exaggeration is slight (Simon, 1982: 4-5).

Simon did not stop with his insight that human beings fabricate artifacts that increasingly comprise the environments they live in. Instead, he introduced a whole new class of sciences that he termed *"the sciences of the artificial"* as opposed to the traditional dichotomy of the "natural" and "social" sciences. Entrepreneurship, as I have argued elsewhere (Sarasvathy and Simon, 2000: Sarasvathy, 2002; Augier and Sarasvathy, 2004) is a quintessential science of the artificial. Modeling entrepreneurship as a science of the artificial involves incorporating several ideas from Simon's work in our scholarship. These include:

Natural laws constrain but do not dictate our designs

Within the constraints of natural law, our designs are contingent on our imagination and action; there is nothing intrinsically "inevitable" about them. Furthermore, constraints can be positive as well as negative. In fact, opportunities are but positive constraints that enable certain actions and not others. For example, paraphrasing what Shane and Venkataraman pointed out earlier, we can state that the invention of the telephone created new *technological possibilities* for communication. But how particular entrepreneurs act upon those possibilities, which stakeholders interact with them and commit particular resources to particular uses of the new technology, together determine over time what opportunities actually come to be and constitute the market for telecommunication.

We should seize every opportunity to avoid the use of prediction in design.

Simon (1996: 147) stated,

> Since the consequences of design lie in the future, it would seem that forecasting is an unavoidable part of every design process. If that is true, it is cause for pessimism about design, for the record in forecasting even such "simple" variables as population is dismal. If there is any way to design without forecasts, we should seize on it.

Expert entrepreneurs routinely use non-predictive strategies in building new firms and markets. Take the case of disruptive technologies in recent strategic management research. Christensen and Bower (1996) showed that listening to current customers and extrapolating from their responses led to the failure of leading firms in the disk drive industry. By relying upon predictive market research, the leading firms ended up under-investing in new technologies that turned out in the future to be disruptive to their current markets. If they had relied instead on *creating* their markets based on the technologies they had developed, particularly using low-cost effectual methods, they might not have missed the opportunities that new entrants in their industry ended up creating (Dew and Sarasvathy, 2001). Counterfactual arguments aside, the fact remains that these leading firms were so stuck in the paradigm of pre-existing markets that the artificial fabrication of new markets was not even on their radar screen as a viable strategic option.

Not relying on predictive information alone allows decision makers to increase the set of alternatives available to them, the first step in creative problem solving (Isaksen, 1987). Furthermore, not relying on predictive information also allows us to design without becoming tethered to final goals (or existing markets) and enables the creation of valuable novelty. In its turn, designing without final goals allows us to free ourselves from the pitfalls of prediction so we can use other mechanisms such as the scientific method (Harper, 1998), the garbage can

(Cohen, March & Olsen, 1972), technology of foolishness (March, 1982), or the effectual logic of control (Sarasvathy, 2001).

Locality and contingency govern the sciences of the artificial.

There are at least two major issues in decision making under high unpredictability: first, the information required to make informed decisions do not yet exist and/or is so dispersed and fragmented as to be inordinately difficult to gather (Hayek, 1945); second, even if such information can somehow be collected and collated, human cognitive limitations make it unviable to be analyzed in any comprehensive way (Simon, 1955). This means that most of the relevant knowledge that goes into making entrepreneurial opportunities is highly local (Dew, Velamuri and Venkataraman, in press) and the sheer variety of local contexts and the persistent heterogeneity of decision makers ceaselessly churns out unforeseeable contingencies.

But expert entrepreneurial decision making and the histories of many new ventures demonstrate that (a) contingencies can be viewed as opportunities to be exploited rather than as misfortunes to be avoided; and (b) while successes and failures are always local, cumulative learning is still possible. As Scott Cook founder of *Intuit* puts it (www.hbs.edu):

> A third part of creating an entrepreneurial culture is to celebrate failure. It's very hard to be an entrepreneur inside a company if you feel you're going to get crucified for failing, because there's risk in being an entrepreneur. If you've tried ten things, five will fail. Besides, if you wait too long so that you can do enough research to be sure an idea will work, you're probably going to be too late. So you've got to create an environment where people know it's okay to fail and, that way, they'll try a lot more. They'll think outside the box. They're willing to think differently because they know that if it doesn't work, they won't be scorched and they'll still have a career.
>
> At times, like when we've closed out a business, we've had something like a celebration of what we've learned. We celebrate what we now know that we did not know before because it will help us make much better decisions in the future. We celebrate those people who fail and everyone around them knows that they produced value. It wasn't the value we intended, but it's okay as long as we learn from it.

The role of serendipities in creating new technological breakthroughs is well documented (Roberts, 1989). And experimentation explicitly designed to falsify hypotheses is the hallmark

of science. Non-predictive strategies combined with the leveraging of local knowledge and unexpected contingencies including those embodied in failures is the core of creating a variety of artifacts, technological as well as entrepreneurial.

Human beings are boundedly rational and docile.

All the insights stated above with regard to the fabrication of artifacts rest on certain facts about human cognitive behavior. Simon's work on bounded rationality is well known. Less known are his arguments for the docile nature of human behavior. Simon defined "docility" as: *The tendency to depend on suggestions, recommendation, persuasion, and information obtained through social channels as a major basis of choice.* (Simon 1993: 156) Docility follows directly from bounded rationality and has been amply evidenced in laboratory work in behavioral economics. In a complete review of the literature, Schotter (2003: 196) concluded the following:

1. Laboratory subjects tend to follow the advice of naive advisors (i.e. advisors who are hardly more expert in the task at hand than they are).
2. This advice changes their behavior in the sense that subjects who play games or make decisions with naive advice play differently than those who play identical games without such advice.
3. The decisions made in games played with naive advice are closer to the predictions of economic theory than those made without it.
4. If given a choice between getting advice or the information upon which that advice was based, subjects tend to opt for the advice, indicating a kind of under-confidence in their decision-making abilities that is counter to the usual egocentric bias or overconfidence observed by psychologists.
5. The reason why advice increases efficiency or rationality is that the process of giving or receiving advice forces decision-makers to think about the problem they are facing in a way different from what they would do if no advice were offered.

In sum, docility suggests that human beings can and do build social artifacts in an interactive fashion, without having to invest in constant vigilance against opportunism.

How do we go from boundedly rational and docile human beings striving to live well in the Jamesian sense and seeking to construct the artificial environments within which they live, work, and play to the notion of "markets" that the social sciences seek to study and understand?

6. The market as an effectual artifact

One path on this journey from James and Simon to the markets we observe in the world has been induced from studies of expert entrepreneurs (Sarasvathy, 1998) and the real-time history of a new industry (Dew, 2002), and specified in Figure 1. No doubt this path is still very much rough-hewn from sparse empirical data that needs to be filled out and elaborated in future studies. In the meanwhile, the extant details of the effectual interaction processes depicted in Figure 1 incorporate both the pragmatist's urging to begin in the mud of common human lives (who I am, what I know, and whom I know) as well as Simon's principles of the artificial outlined in the previous section. Effectuators are boundedly rational and docile; they try not to rely on predictive information; while fully heeding the constraints of reality, they nevertheless seek to re-make the world either with or without final goals; and they continually leverage locality and contingency in such re-making.

Figure 1 traces the effectual process as follows: Based on who he is, what he knows, and whom he knows, the effectuator generates a set of possible actions (actions for which he has high levels of self-efficacy) and starts interacting with people in his environment. Because both he and his potential stakeholders are docile, they are able to compare aspirations and abilities, debate the possibilities that they envision, and begin negotiating features of the project. Note that at this stage, both outcomes and returns to outcomes are vague and unpredictable at best. So the contents of the negotiations are focused on the nature and characteristics of the project (i.e. what the pie may look like) rather than the type and quantity of returns to the project (i.e. the size

and distribution of the pie). Note also that what the effectual process does at each stage and the market that is created at the end of the process are both determined by who comes on board; who comes on board is not determined either by an exogenous market or predictive information provided by customers and pundits. Who comes on board is determined by the people the effectuators are able to call upon or happen to meet and by the actual commitments that some of those people are willing to make to come on board the enterprise.

Depending on what the stakeholders are willing to commit and what they negotiate in return for their commitment, a chain of new means and goals become available to the effectuators. Assuming that this chain grows unbroken for a meaningful period of time, two cycles of consequences are set in motion: one is a widening cycle that increases the pool of resources available to the growing stakeholder group; the other is a converging cycle that pushes the growing group toward increasingly specific goals that become more clearly defined and less flexible as the social artifact coalesces into being.

In this effectual process, the social artifact, whether a firm or market or organization or institution becomes in many cases an embodiment of novelty, taking on a shape often unanticipated and sometimes even unimagined by the individual stakeholders whose commitments actually gave birth to it. For a detailed empirical examination how this process worked in the creation of the RFID industry, see Dew (2003). Case studies and early stage histories of most successful entrepreneurial ventures, whether in the for-profit or social sectors should provide compelling evidence for how this process operates and why it leads to novelty.

Let's briefly consider here the example of new ventures in the food industry to find illustrations of this process. As stated earlier, the fact that people get hungry does not imply a market for any particular type of food or the specific offerings of any particular firm. Of course,

since markets for food are very well understood in general, the manufacturer/entrepreneur can induce people to try new food products through several marketing and promotional techniques including free samples. But even in this relatively mundane industry, new markets get created through effectual processes. For example, the founders of Starbucks opened their first shop only as an outlet for selling fresh roasted and ground coffee beans, largely because they themselves were coffee afficionados. Only requests from walk-in prospects for trying out the coffee in the shop led them to the idea of a coffee shop such as the modern Starbucks Coffee shops. Even armed with the knowledge about existing markets of coffee drinkers, no one could have predicted ex-ante the market for Starbucks. In any case, the founders of Starbucks certainly did not. That market was created through a transformational process that involved the interactions of multiple stakeholders that over time coagulated into a familiar shape that we all recognize as a "market" for specialty coffees and coffee culture (Vishwanath and Harding, 2000).

To put it in a nutshell, in an effectual universe, Needs, Wants and Desires ≠ Demand; and, Demand ≠ Supply ≠ Market. The relationships between supply and demand are circular, interactive and contingent rather than linear, unilateral and inevitable (Earl, 1998). In a plural and effectual universe markets are artificial inventions endogenous to the entrepreneurial process.

7. Entrepreneurial opportunities: Constructing corridors to social science primitives

If we put relevant nuggets from the pragmatist philosophers together with Simon's ideas in *The Sciences of the Artificial,* and use the combined lens to examine entrepreneurial opportunities, we get the following two premises about what human beings do and two conjectures about how demand-side artifacts come to be:

Jamesian Premise: *People strive to live well*

Simonian Premise: *People strive to construct their environments.*

My first conjecture based on the two premises above is that entrepreneurship is a powerful tool in both these endeavors.

My second conjecture is that profitable opportunities get created in those societies and epochs in which people strive to live well and construct their environments using entrepreneurial means and methods.

A historical analogy might be of help here in clarifying my key points. The universe is for the most part the same as it was before Francis Bacon spelled out the elements of the scientific method in *The New Organon* in the 16th Century. Yet, armed with the scientific method, socio-political and economic institutions could be created that led to a significantly more accelerated pace of scientific progress that enabled a continuing explosion of new technological innovations. Understanding the scientific method was crucial to our proactive creation of technological inventions. Alfred North Whitehead summed it up best when he remarked that the greatest invention of the nineteenth century was the idea of invention itself. Similarly, it is my contention that there exists an entrepreneurial mode of reasoning and action that creates profitable opportunities in the world. Understanding the entrepreneurial method and building effective institutions based on it will therefore be key to the creation of economic opportunities.

This line of argument has important implications for policy and research. Our economic development efforts, for example, would be extremely different if we accept the premise that entrepreneurs go where economic opportunities are versus if we believe that opportunities get created where entrepreneurs are. In the former case, we would invest in creating opportunities – i.e. deploy our resources toward bringing the latest technologies and the infrastructure needed for

them to the regions we are interested in developing. In other words, we would invest in incentives and inducements for attracting hi-tech entrepreneurs by trying to create opportunities for them locally. But if we accept the premise that entrepreneurs create economic opportunities, we would invest our economic development resources in entrepreneurship education and support local entrepreneurs who seek to leverage pre-existent local resources to create new opportunities that do not depend upon new technologies transplanted from other regions of the world. Prahalad and Hammond (2002), for example, have shown how even multi-national corporations can benefit from local solutions created in developing countries that usually pass under the radar of major economic development initiatives. Similarly, the social venture, Ashoka, leverages the efforts of social entrepreneurs in remote corners of the world who have found local solutions to a variety of social problems from poverty to global environmental issues.

It is obvious that both approaches (i.e. bringing opportunities to entrepreneurs and supporting entrepreneurs in the creation of new opportunities) would be useful and necessary in fostering economic development. But the overarching emphasis of most policymakers today rests on the premise that opportunities have to pre-exist entrepreneurs.

The same sort of emphasis dominates our research efforts. Recurring back to my earlier review of the literature on entrepreneurial opportunities, we have predominately invested in the premise that opportunities pre-exist entrepreneurs; and that entrepreneurs primarily "discover" what already exists. The *sources* of these opportunities are attributed to exogenous technological progress and social changes rather than to the entrepreneurial method. There is, however, an ongoing debate among scholars in the field as to the subjective versus objective nature of entrepreneurial opportunities. For example, scholars such as Gartner (2001) have argued that opportunities do not exist "out there" but are enacted in the sense of Weick (1979). The thrust of

my thesis takes a different tack on this debate. The question here is not whether opportunities exist objectively in the world or whether they exist primarily in the entrepreneurs' minds. Instead, the key debate concerns the issue of whether opportunities make entrepreneurs or whether entrepreneurs create opportunities.

Some of the pragmatist philosophers and Simonian scientists offer a plausible answer: The world exists – that is not in question, however one perceives it or interprets it or not. But that does not mean that technologies exist; or opportunities exist. Technologies have to be invented, fabricated, constructed, made – from the materials in the world. The scientific method effectively enables such making. So too, I contend, opportunities and markets have to be invented, fabricated, constructed, made – through the peculiar processes of human action and interaction that comprise the entrepreneurial method.

The markets that the social sciences take as primitives in their analyses are artifacts that are constructible through the entrepreneurial method. Entrepreneurial opportunities, therefore, are the corridors that entrepreneurs construct leading from the daily aspirations of all human beings to live well and obtain greater control over their particular destinies to the organization of preferences, utilities, institutions and technologies that the social sciences seek to study under the rubric of "markets."

Q. E. D.

References

Aldrich, H. 1999. *Organizations Evolving*. London: Sage.

Arrow, K. J. 1974. Limited Knowledge and Economic Analysis. *American Economic Review* 64(1): 1-10.

Augier, M., and Sarasvathy, S. 2004. Integrating evolution, cognition and design: Extending Simonian perspectives to strategic organization. *Strategic Organization* 2(2): 169-204.

Busenitz, L. W., West III, G. P., Shepherd, D., Nelson, T., Chandler, G. N., and Zacharakis, A. 2003. Entrepreneurship Research in Emergence: Past Trends and Future Directions. *Journal of Management* 29(3) 285–308.

Carpenter G. S., and Nakamoto, K. 1989. Consumer Preference Formation and Pioneering Advantage. *Journal of Marketing Research* August 1989: 285-298.

Christensen, C. M., and Bower, J. L. 1996. Customer Power, Strategic Investment and the Failure of Leading Firms. *Strategic Management Journal* **17**:197-218.

Cohen, M. D., March, J. G., and Olsen, J. P. 1972. A garbage can model of organizational choice. *Administrative Science Quarterly* 17(1): 1-25.

Dew, N. 2003. Lipsticks and Razorblades: How the Auto ID Center used Pre-commitments to build *The Internet of Things*, *Dissertation, University of Virginia,* Charlottesville, VA.

Dew N., Velamuri, S. R., and Venkataraman, S. In Press. Dispersed knowledge and an entrepreneurial theory of the firm. *Journal of Business Venturing.*

Dew, N., and Sarasvathy, S. D. 2001. Of immortal firms and mortal markets: Dissolving the *Innovator's Dilemma.*' Presented at *The Second Annual Technology Entrepreneurship Research Policy Conference* University of Maryland, available for download from www.effectuation.org.

Dosi G. 1982. Technological Paradigms and Technological Trajectories. *Research Policy* **11**:147-162.

Earl P. 1998. Consumer Goals as Journeys into the Unknown. In *The Active Consumer* Bianchi, M. (ed.) London: Routeledge.

Fligstein, N. 2001. *The Architecture of Markets: An Economic Sociology of Twenty-First-Century Capitalist Societies.* Princeton University Press.

Gartner, W. B., Carter, N. M., and Hills, G. R. (2001). Opportunities are enacted! Paper presented at the *Movements in Entrepreneurship Workshop*. Entrepreneurship and Small Business Research Institute, Stockholm, Sweden.

Gualerzi D. 1998. Economic Change, Choice and Innovation in Consumption. In *The Active Consumer* Bianchi M. (ed.), London: Routeledge.

Harper, D. 1998. How entrepreneurs learn: A Popperian approach and its limitations. *Working paper*, New York University.

Hayek, F. A., 1945. The Use of Knowledge in Society. *American Economic Review* 4; 519-30.

Hirschman AO. 1985. *Rival Views of Market Society and Other Recent Essays.* Cambridge: Harvard.

Isaksen, S. G. (Ed.). 1987. *Frontiers in creativity research: Beyond the basics*. Buffalo, NY: Bearly Limited.

James, W. 1996 [1912]. A world of pure experience. *Essays in radical empiricism* University of Nebraska Press: 39-91.

Joas, H. 1996. *The Creativity of Action*. Chicago: University of Chicago Press.

Kirzner, I. 1973. *Competition and entrepreneurship*. Chicago IL University of Chicago Press

Kirzner, I. 1979. *Perception, opportunity, and profit: Studies in the theory of entrepreneurship*. University of Chicago Press.

Lancaster K. 1971. *Consumer Demand; A New Approach*. New York: Columbia University Press.

March, J. G. 1982. The technology of foolishness, In J. G. a. J. P. O. March (Ed.), *Ambiguity and choice in organizations*: 69-81. Bergen, Norway: Universitetsforlaget.

Nelson, R., and Winter, S. 1982. *An Evolutionary Theory of Economic Change*. Cambridge:

Olson, M., and Kahkonen, S. 2000. *A Not-so-dismal Science: A Broader View of Economics and Societies.* Oxford University Press.

Popper, K. 1963 *Conjectures and Refutations.* Routledge.

Prahalad, C. K., and Hammond, A. 2002. Serving the World's Poor, Profitably. *Harvard Business Review,* 80(9): 4-11..

Roberts, R. M. 1989. *Serendipity: Accidental Discoveries in Science.* NY: John Wiley & Sons.

Sarasvathy, S. D. 1998. How do firms come to be? Towards a theory of the prefirm, *Dissertation, Carnegie Mellon University,* Pittsburgh, PA.

Sarasvathy, S. D. 2001a. Causation and Effectuation: Towards a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review* **26**(2): 243-288.

Sarasvathy, S. D. 2001b. Effectual reasoning in entrepreneurial decision making: Existence and bounds. *Best paper proceedings, Academy of Management 2001* Washington DC, August 3-8, 2001.

Sarasvathy, S. D. 2003. Entrepreneurship as a science of the artificial. *Journal of Economic Psychology* 24: 203-220.

Sarasvathy, S. D., Dew, N., Velamuri, S. R., and Venkataraman, S. 2003. Three views of entrepreneurial opportunity. *Handbook of Entrepreneurship Research,* Z.J. Acs and D.B. Audretsch (eds.), Kluwer L aw International: 141–160.

Sarasvathy, S. D., and Simon, H. A. 2000. Effectuation, near-decomposability, and the creation and growth of entrepreneurial firms. presented at *The First Annual Technology Entrepreneurship Research Policy Conference*, University of Maryland, available for download at www.effectuation.org.

Sarasvathy, S. D., and Kotha, S. 2001. Managing Knightian Uncertainty in the New Economy: The RealNetworks Case. In *Research in Entrepreneurship and Management* Vol 1: E-commerce and Entrepreneurship. Butler J. (ed.) IAP, Greenwich, CT, 31-62.

Schumpeter, J. A. 1934. *The theory of economic development: An inquiry into profits, capital credit, interest and the business cycle*. Cambridge MA Harvard University Press

Schotter, A. 2003. Decision making with naive advice, *American Economic Review,* 93(2): 196-201.

Schumpeter, J. A. 1939. *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process* 2 vols. New York: McGraw Hill.

Shane S. 2003. *A general theory of entrepreneurship: The individual-opportunity nexus*. UK: Edward Elgar.

Shane, S., and Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review* 26(1); 13-17.

Simon, H. A. 1955. A behavioral model of rational choice. *Quarterly Journal of Economics* 69: 99-118.

Simon, H. A. 1969 [1996]. The architecture of complexity. *Sciences of the Artificial,* 3rd Edition, Cambridge, MIT Press.

Simon, H. A. 1993. Altruism and Economics. *American Economic Review* 83(2): 156-161.

Stigler, G. J., and Becker, G. S. 1977. De Gustibus Non Est Disputandum. *American Economic Review* 67(2): 76-90.

Venkataraman, S. 1997. The distinctive domain of entrepreneurship research: An editor's perspective, in J. Katz and R. Brockhaus (eds.) *Advances in entrepreneurship, firm emergeence, and growth*, 3 Greenwich CT JAI Press: 119-38.

Vishwanath, V. and Harding, D. 2000. The Starbucks Effect. *Harvard Business Review*, March-April 2000.

Weick, K., 1979. *The Social Psychology of Organizing* (Second Edition). New York: McGraw Hill.

White, H.C. 1981. Where Do Markets Come From? *American Journal of Sociology* 87: 517-547.

Figure 1: A dynamic model of the creation of new social artifacts through effectuation