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1. What is the Question?

Let us define entrepreneurship as creativity and the evolution of novelty. Let us suppose, the main thesis of the chapter, that entrepreneurship is an action that does not differ from everyday action such as walking, driving, or chewing gum. If the definition and supposition are granted we can conclude, as illustrated in Figure 1, that the theory of everyday action, such as walking or chewing gum, is one and the same as the theory of evolution.

Everyday Action \equiv Entrepreneurial Action \equiv Evolution
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Figure 1: A Single Theory of Action and Evolution

The conclusion is definitely strange if not extraordinary. It is based on a subtle but subversive thesis: There is no difference between everyday action and creativity or evolution. This conclusion is extraordinary only because it goes against the dominant dogmas in economics (i.e., neoclassical theory) and evolutionary biology (i.e., neo-Darwinian theory). Both dogmas draw a radical divide between action and evolution. For neo-Darwinian theory, action is phenotype ultimately determined by genotype—while the genotype evolves according to another mechanism. For neoclassical economics, action is determined by rational calculation of the efficient allocation of *given* resources—while resources evolve according to another mechanism. To undermine the radical divide between the theory of action and the theory of evolution, this chapter shows how everyday action—from walking, fetching water, to fishing—is entrepreneurial

at first level of approximation—and hence should be the basis of the theory of evolution.

Let us start with Robinson Crusoe, a favorite among economists. Robinson's "everyday action" would involve going to the sea to catch fish with his bare hands. Robinson's "entrepreneurial action" might involve the sharpening of a tree branch to catch fish. The term "evolution" denotes the change of technology from the use of bare hands to the use of branches.²

However, the technology of catching fish by hand is entrepreneurial because the action undergoes improvement through time. The agent will learn different ways of using the hands. For instance, one way might be to use the hands along with the chest to block and trap the fish. Another way is to dive from a rock onto the fish, which amounts to using the body and the hands as a spear. The latter method would make it easier to find a new function for the tree branch, i.e., to replace the invented function of the arm/hand. So, evolutionary change is not limited to the physical use of the tree branch. The tree branch is actually a continuation of the everyday action of catching fish by hand—where such action has already undergone change. As Alfred Lotka argues (1945), there is no ultimate difference between manufactured tools and biological tools; this is also implied in Richard Dawkins' concept of "extended phenotype" (1982). So, everyday action entails evolution. The fact that an evolutionary change appears as a quantum jump should not mislead us to conceive evolution or entrepreneurship as contrary to everyday action.

It is common knowledge that the «progress» of economic theory in the past two centuries has neglected entrepreneurship (see Baumol, 1968; Demsetz, 1983; Blaug, 1998; Endres & Woods, 2006). This should not mean that economists did not discuss entrepreneurship. Actually, they have discussed it intensively, especially starting in the early 1980s. These discussions, as Milo Bianchi and Magnus Henrekson (2005) demonstrate, generally trace entrepreneurship to some talent, drive, or individual trait and then proceed to draw the macro-

economic implications. That is, these discussions do not explain entrepreneurship.

The fact that neoclassical theory has no explanation of entrepreneurship is not accidental. It is rather due to a fallacious dichotomy that underpins neoclassical theory between everyday action and entrepreneurial action. The dichotomy is certainly helpful in solving many problems at secondary and tertiary approximations. However, at first approximation, if we want to analyze entrepreneurship, the dichotomy is unfounded. The dichotomy amounts to presenting everyday action as instrumental or, to use the economist terminology, “maximizing” behavior, while presenting entrepreneurial action as creative in the sense of innovative. Consequently, there is no single theory that can explain everyday action and entrepreneurship/evolution.

The everyday/entrepreneurial dichotomy leads economists into two choices: The first choice, undertaken by the classical and Austrian economic traditions, is to assume that entrepreneurship is part of the nature of the actor, i.e., a character trait. The second choice, undertaken by the neoclassical tradition, is to postulate that entrepreneurship, similar to innovation, is the outcome of stochastic, exogenous shocks. This approach has been used extensively in growth models. Another approach, used in neoclassical industrial organization literature, is to model innovations as output of a production function, where the inputs are investments in research and development. As Suzanne Scotchmer (2004) shows, this amounts to treating innovations as products such as shoes and clothes. This means that innovations can be produced at will as if they are paradoxically already known.

In contrast, Anthony Endres and Christine Woods (2006) have suggested a three-way distinction among three theories of the entrepreneur—neoclassical economics, Austrian economics, and behavioral economics. However, as they concede, there are very close similarities between Austrian economics and behavioral economics. On the other hand, some aspects of behavioral economics can be easily incorporated into neoclassical economics (Khalil, 2006a). For

instance, the notion of bounded rationality, as proposed by Herbert Simon (1957, 1987), has been incorporated into neoclassical economics. It is now part of the general idea of scarcity, but extended to the human brain: as a consequence of limited computational capacity, agents use heuristics and rules of thumb, leading to mistaken decision-making on some occasions. So, in the end, the insights of behavioral economics are incorporated either into neoclassical economics or Austrian economics. Therefore, economists have so far resorted to one of these two alternatives: either entrepreneurship is the product of a personality trait (Austrian/classical) or the result of some exogenous stochastic shocks (neoclassical).

Neither option is satisfactory, however. The option that traces entrepreneurship to some natural character is basically tautological. The option that traces entrepreneurship to exogenous shocks simply begs the question: what is the origin of the shock? So, we need to go back to the drawing board, and formulate a different theory of action.

2. The Plan of the Essay

The attempt to articulate a *single* theory of action and evolution may sound ambitious. The dominant economic theory has no theories of evolution or entrepreneurship, other than the appeal to exogenous factors. This is an embarrassing state of affairs given that entrepreneurship is the main impetus of economic development, prosperity, and evolutionary change.

But this state of affairs should not be surprising. For the most part, neoclassical economic theory has severed the connection between everyday action and entrepreneurial action and, in turn, presented everyday action as a mechanistic response to stimulus. Consequently, entrepreneurial action has to be introduced as the outcome of unexplained exogenous events. Classical and Austrian economics, on the other hand, reject the idea of action as a mechanistic response to stimulus. They present action as expressive of some innate essence or character trait and, hence, entrepreneurial action is at the heart of action itself. But this argument is tautologous: entrepreneurs are entrepreneurs because it is in their nature to be

entrepreneurs. In short, neoclassical theory presents action as mechanistic and conceives entrepreneurship as an exogenous intervention in everyday affairs. In contrast, the other approaches present action as expressive of essences, and thus entrepreneurship is explained by assuming entrepreneurship. The dichotomy formulated by John Dewey and Arthur Bentley (1999), between the “interactional” and the “self-actional,” can be profitably applied here. Neoclassical theory holds entrepreneurship to be “interactional” insofar as the agent reacts to changing stimuli. In contrast, according to classical/Austrian theory, entrepreneurship is “self-actional” in the sense that the agent is motivated by an essence or a trait in one’s nature and, hence, may change one’s action without any change in the stimulus (Khalil, 2003a).

Despite the differences between the interactional and self-actional views, they share a common substantivist metaphysics, which forms the deeper reason for their inability to explain entrepreneurship. According to this metaphysics, an agent consists of two parts—the “end” of the agent, and the “means,” such as bodily ability, physical tools, and natural resources. Interactional and self-actional approaches may differ in specifying the contents of ends and means, but both are substantivist in the sense that the agent becomes a divisible individual, and each part of the agent is treated as a substance that can be defined independently of the other part. Such a metaphysics hinders the ability to see how action entails the creative development of the agent, i.e., evolution.

It is the contention of this essay that economics is incapable of explaining entrepreneurship as long as its theory of action is informed by a substantivist metaphysics, i.e., by the end-means dichotomy that divides the individual in half. To explain entrepreneurship-qua-creativity, we need to break away from the substantivist metaphysics of economics. The work of Alfred North Whitehead and other process philosophers provide a clear alternative to substantivist metaphysics. Whiteheadian process thought advances a philosophy of the organism, called here “organismic” metaphysics. The organismic approach should help us identify the problems one must overcome in order to

explain entrepreneurship.³ In short, the essay seeks to build bridges between a Whiteheadian approach, Deweyan terminology, and the two basic traditions in economics. Figure 2 summarizes the terminology we will use.

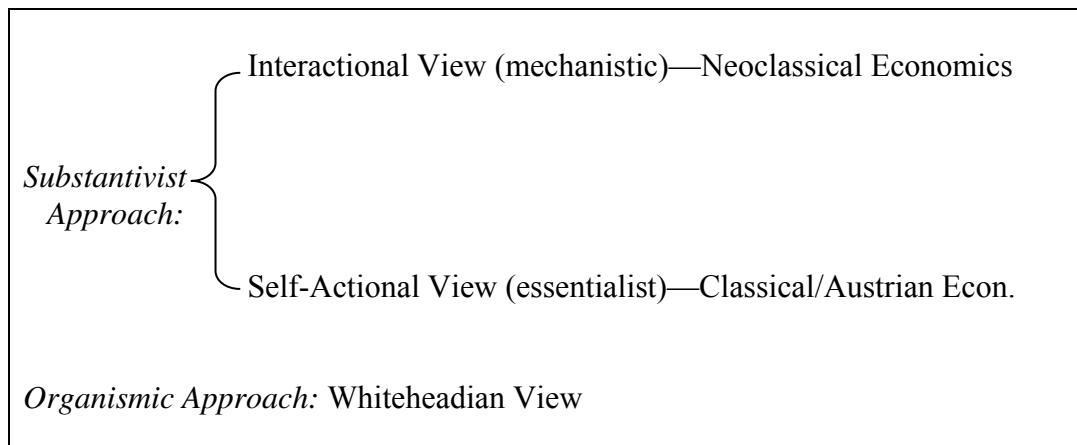


Figure 2: A Guide to the Terminology

3. Neoclassical Economics

Every tradition in economics is defined by its answers to the most fundamental questions: What is the human condition which economists call the “economic problem”? What are the issues that humans need to focus on in order to solve the economic problem?

The economic problem, for neoclassical economics, is the problem of “scarcity.” That is, we have to be efficient in how we use resources because resources are scarce. If there were no scarcity, there would be no need to attend to the issue of efficiency—and there would be no need for the discipline of economics. It is crucial to note that the neoclassical notion of scarcity is narrow, and differs from the common usage of the term. Crucially, it ignores creativity, i.e., the ability of the agent to create more resources. From the neoclassical perspective, resources are scarce in the sense that the budget is “given,” i.e.,

defined as a basket of goods. The agent can only decide how to make the best, i.e. efficient, use of the contents of the given basket.

The core of the neoclassical program is the idea of efficiency (or allocation). The roots of this idea can be traced to the 1870s when three economists independently advocated marginalist analysis in what came to be called the “marginalist revolution” (Blaug, 1997, Chapter 8). Leon Walras in Switzerland, Carl Menger in Austria, and William Stanley Jevons in England advanced the simple and seemingly innocuous idea that when agents decide to consume goods, such as peanuts, they do not make a decision whether to consume all (e.g., one kilogram) or none. They can decide to consume a fraction of the kilogram. As agents consume more, they get less satisfaction from the last unit, i.e., the marginal satisfaction declines with more consumption of the same good. Thus, as they consume more, other alternatives start to look attractive. They would be ready to consume more only if the price of the good declines relative to the prices of the alternatives.

This means that agents arrange their consumption efficiently, i.e., make sure that they receive the greatest satisfaction from their given resources. For instance, if the price of peanuts goes up, they reason that it would be better to spend the last euro on some other good. So, agents allocate their resources among diverse goods in such a way that the satisfaction they receive from the expenditure of the last euro on each good gives them an equal amount of satisfaction. For instance, if the agent receives twice as much satisfaction from the last euro spent on good X as from the satisfaction derived from the last euro spent on good Y, the agent would not be rational. To be rational is to be efficient: the agent should demand more of good X and less of good Y until the satisfaction derived from the last euro spent on both is equal. And if the price of good Y declines, it means the last euro spent on Y generates greater utility than the last euro spent on all other goods. This prompts the agent to demand more of Y, or less of all other goods, until one’s given resources are spread efficiently.

This basic idea can be expressed mathematically as the maximization of the utility function (U), given the income constraint (I):

$$\text{Maximize: } U = U(X, Y, Z)$$

$$\text{Subject to constraint: } I = p_x X + p_y Y + p_z Z$$

where X, Y , and Z are the quantities of three different goods, and p_x , p_y , and p_z the respective prices of the three goods. So, the consumer allocates one's given income (I) among the three different goods in such a way that the mix of the three goods would give the agent the greatest satisfaction (U).

The same logic of maximization applies when the maximizer is a firm. Let us say that the firm produces the good X and sells it at the market price p_x . The firm, in competitive markets, cannot control the price. Also, in competitive markets, the firm cannot control the amount it sells (for reasons that need not be discussed here). What the firm can control is the mix of inputs that produce the good X . In neoclassical theory, it is traditional to assume three inputs—labor (L), capital (K), and land (T). So, the firm, in order to maximize profits (π), wants to employ these inputs in such a way that minimizes its cost according to this formula

$$\text{Maximize: } \pi = p_x X - TC$$

$$\text{Subject to constraint: } TC = wL + iK + rT,$$

where $p_x X$ is total revenue; TC total cost; w , i , and r are the wage rate, interest rate, and rent of the three inputs, respectively. In this fashion, given total revenue $p_x X$, the firm maximizes profits (π) when it minimizes the budget used to produce X , i.e., total cost (TC). The firm can, according to neoclassical economics, minimize total cost *without improving the technology*. As discussed below, this feature sets neoclassical economics apart from classical economics.

But how can one suppose that the firm minimizes total cost without an improvement of technology or, alternatively, finding cheaper resources? One could suppose so because, again, of marginal analysis. The contribution of each input is conceived to decline at the

margin as the firm adds more inputs. For instance, if the firm adds an extra unit of labor to a given piece of land or a given factory, output increases, but it increases at a declining rate. Or, when the firm withdraws a unit of labor, the marginal contribution of the remaining labor would rise. The task for the firm is to combine inputs in such a way that the contribution of each, given its cost, is equalized across all inputs. So, if the price of one input increases, the firm would use less of that input until its marginal contribution is higher, i.e., justified by the higher price.

There are many details in the theories of consumption and production that we can ignore. The salient point that underlies both theories is that the agent—whether consumer or producer—can manipulate the mixture of the means in order to maximize the end. In the case of the consumer, the means are the different goods of enjoyment. In the case of the producer, the means are the different inputs into the production process. While the consumer tries to make the best of a given budget, the producer tries to minimize the budget of producing a given output. In either case, the means are supposedly combined efficiently in order to maximize the product (utility) given the budget or, what is the same thing, to minimize the budget given the product (output).

In maximization/minimization, action is mechanistic. Action is simply a reaction to the stimulus, for instance, the change of the price of goods. Such a reaction does not prompt technological innovation or creativity. So, how can entrepreneurship-qua-creativity be explained? The only option is to assume that creativity takes place due to shocks from the outside the system. The neoclassical notion of efficiency simply cannot explain creativity, which it was constructed, from the beginning, to ignore.

4. Classical Economics

Does classical economics offer a framework that can better explain entrepreneurship? Much has been written about the classical tradition and how it differs from neoclassical economics (e.g., Harris, 1978, Introduction). One can trace the classical tradition to Adam Smith, David Ricardo, and Karl Marx. It has experienced a revival recently in the work of modern Marxian economists (e.g., Shaikh &

Tonak, 1994) and neo-Ricardians such as Piero Sraffa (1960; cf. Steedman, 1977).

While neoclassical economics defines the economic problem in terms of *efficiency*, classical economics defines the economic problem in terms of the production of *surplus*. In the classical paradigm, resources are not scarce, but rather spread through nature in heterogenous qualities. For example, land is not scarce, but rather it comes in different gradations of quality or proximity to a desired location. The economic problem for classical economists is how agents can work productively and abstain from luxury consumption so that they can effectively reach out to lower quality resources. If agents do not work productively, the product of low-quality land may not justify the effort, i.e., the surplus would be negative.

So, the reduction of unproductive activities is a major policy conclusion of classical economics. Agents have to make such differently available resources readily available. Thus, the economic problem is not about the optimum or proper mix of inputs or goods to maximize an output. It is rather the application of productive capacity to subjugate nature and make less accessible resources—such as less fertile land or mineral deposits that are harder to extract—more ready for human consumption.

The application of productive capacity involves the expenditure of matter and energy, what Karl Marx called the “means of production.” The economic problem is that the resulting output should at least be large enough to cover the costs of the expended inputs or means of production. That is, the economic problem amounts to securing non-negative surplus (S), the difference between output (O) and input (I):

$$S = O - I.$$

Given this simple equation, the economic problem is defined as the production of non-negative surplus ($S \geq 0$).⁴

Interestingly, with one important difference, the surplus formula resembles the profit function in neoclassical theory mentioned above, viz.,

$$\pi = p_x X - TC$$

where S corresponds to π , O to $p_x X$, and I to TC . The one important difference is that TC in neoclassical theory can be minimized by adjusting the mix of inputs in light of changing input prices *while using the same technology*. In contrast, for classical theory, inputs (I) is a single value given by the technology. No degree of adjustment to the input mix can change the input cost, because inputs cannot be combined in different proportions. That is, for classical theory, each technology has one single combination or mix of inputs and, hence, has one single I . Economists call such technology “Leontieff technology,” which does not allow substitution or re-combination among inputs. In other words, for neoclassical theory, there is more than one way to produce X using the same technology, while for classical theory, there is only one way of producing X using the same technology.

However, if the classical formula of surplus allows only one way of producing X , what is the agent *doing* in classical economics? There is no efficiency problem in classical economics and, hence, the agent cannot be allocating resources, i.e., choosing the correct mix of inputs.

Nonetheless, the agent can have two different functions in the classical model. First, the agent can expand output by either abstaining from luxury consumption or by reducing expenditures on unproductive services. Luxury consumption and unproductive services are seen as superfluous and, to promote economic growth, they can be reduced at will. Second, the agent can invent a new technology that improves on the method of production, i.e., leads to greater output per input.

Concerning the first function, can the agent reduce luxury consumption and unproductive services at will? Regarding luxury, if

the agent reduces luxury consumption, the agent would be able to invest the saved income which, in the second period, would lead to higher output. However, upon reflection, the reduction of luxury and the consequent economic growth does not necessarily entail innovation or evolution of technology. The growth can take place on a replicative scale.

Concerning the productive/unproductive distinction, it is ultimately untenable. To make sense of the concept of unproductive labor, one must assume an identical system without the supposedly redundant or unproductive labor. But why should one stipulate that such an ideal system is tenable or costless? For instance, if there is expenditure on guards, accountants, and lawyers, their services must have been needed given the level of trust in society, which is obviously less than ideal. But even in an ideal system of trust, it is not costless to maintain such institutions. In the ideal system, society must spend a great amount of resources on education, public occasions, and the like to sustain the level of trust. But classical economists did not see it in this manner. They preached the virtue of magnification of surplus. They saw luxury consumption as the clear enemy of the production of surplus and the wealth of nations. They also saw unproductive expenditure on bureaucracy, army, and other services as the clear enemy of surplus and the wealth of nations.

This raises the issue: Why should humans strive to magnify the surplus? Why should the capitalists ensure, to use Marx's term, the "accumulation of capital"? The assumption that humans are driven to accumulate surplus is based on an essentialist, self-actional view. It explains entrepreneurship, ambition, or internal motivation by assuming it (Khalil, 2006b).

Such a tautological explanation is more evident in the second supposed function of the agent in the classical model. Namely, the agent can innovate at will. If this is the case, the agent has desires which are defined prior to action—as if action were merely the execution of a given plan.⁵ This is why Dewey and Bentley called such an explanation "self-actional": the action is supposed to

externalize a deep desire for greater wealth or surplus. To enhance the production of surplus per unit of input, the agent must dedicate a portion of current surplus to the research and innovation that brings about an improved technology. Such improved technology entails that greater output is produced for the same input expended or, equivalently, that the same output is produced with less inputs.

But the function of innovating again begs the question: Why is the agent driven to innovate? Classical theory explains creativity by assuming it.

5. Austrian Economics

Austrian economics is also generally based on an essentialist, self-actional view (see Smith, 1990). For Austrian economists, entrepreneurship is an expression of purposeful, human action, as opposed to so-called mechanistic action. This opposition is best expressed in the notion of “praxis” in the work of Ludwig von Mises (1966), a major figure in Austrian economics. Mises distinguishes between purposeful behavior, which can only be found in humans, and mechanistic behavior, which characterizes the behavior of non-human animals/plants and the biological aspects of human behavior such as instincts. The human/non-human distinction runs through much of the social theory informed by Germanic romanticism (Khalil, 1996). The Austrian dichotomy, similar to Marx’s concept of abstract labor, is a reminder of the essentialist metaphysics of vitalism, but carried over to the supposed divide between human and non-human living organisms.⁶

Joseph Schumpeter (1949) also regards entrepreneurship as expressive of the human impulse to be creative. But he differs from Mises by regarding entrepreneurship as a character trait possessed by different people in different degrees, or even not at all. Schumpeter likened the entrepreneur to the medieval knight who rushes to adventure out of an urge for self-aggrandizement. Such an urge, which Schumpeter playfully called “irrational,” differs from arbitrage, i.e., a mechanistic action that takes advantage of the difference in prices of the same good. Arbitrage is the calculative action of rational agents

who make money by buying cheap in one market and selling dear in another. Such action helps the two markets to be connected and, hence, to become one market, i.e., to reach an equilibrium. In contrast, driven by inner impulses the entrepreneur introduces new ideas or novelty as a way to self-aggrandizement, and in the process upsets the old equilibrium.

On the other hand, for Israel Kirzner (1973, 1985), a student of Mises, the entrepreneur brings order to the system. As an arbitrageur, the entrepreneur is distinguished from other agents by greater “alertness.” Such a trait allows the entrepreneur to see opportunities, such as differences in prices, which others cannot.⁷

Despite their differences, Mises, Schumpeter, and Kirzner identify entrepreneurship as a character trait unique to humans. Likewise, Frank Knight (1971), who sympathizes with Austrian economics in other regards, views the entrepreneur as a risk-taker—ready to take action when outcomes are uncertain. Knight distinguishes between risk, which is quantifiable, and uncertainty, which is a unique. One cannot form a quantifiable probability of unique events. Sometimes, the agent is in total ignorance, unaware of whether the event is unique. Agents who bid on unique events may earn windfall profits because the cost of the bid cannot reflect probability that is non-quantifiable. Such windfall profits cannot be equalized in the market because the market can only equalize ordinary profits that stem from quantifiable or predictable events, i.e., risk. So, for Knight, entrepreneurs are the residual claimant of activities that are uncertain, which are to be distinguished from ordinary or risky activities. Knight’s view explains the persistence of windfalls profits. However, this explanation does not explain entrepreneurship itself.

All these theories in the Austrian tradition, which are similar in some aspects to the classical tradition, see entrepreneurial action as expressive of a character trait. While ordinary agents may not be characterized by such a trait, the ones who are so are identified as entrepreneurs. This explanation, similar to that proffered by classical economics, is a tautology: it explains entrepreneurship by assuming it.

6. The End-Means Dichotomy

As mentioned above, both economic approaches are limited by their assumption of a substantivist metaphysics that divides the agent into two independent substances. One of these two halves consists of the end which the agent tries to maximize; this may be the utility/profit of neoclassical economics, or the surplus of classical economics. The other half consists of the means that the agent needs to recombine efficiently (neoclassical theory) or reduce (classical theory). But this ends-means dichotomy cannot accommodate creativity and the rise of novelty.⁸ The basic problem with the dichotomy is that it pits the agent against the agent's capability, which the agent, in both theories, sees in a wholly instrumental fashion. In both schools of thought, the resources of the agents (TC in neoclassical theory, and I in classical theory) are combined with the environment before they are juxtaposed against the end. So, the agent treats his own body, skills, mental and physical development, and tools as objects that stand external to himself; they are regarded no differently than are trees, rivers, and soil, say.

In neoclassical theory, land (T) is treated symmetrically with labor (L) and capital (K). To start with, human labor and tools are mere capacities to perform work, while land is the source of nutrients, minerals, and materials which the agent needs to appropriate—and indeed to *rob*.⁹ Obviously, as a result of production, land (T) does not become more creative, but on the contrary loses some of its nutrients and resources. To treat the capacity to perform work (L and K) as symmetrical with T amounts to treating them as incapable of creativity. Labor and its tools (K) are there to assist in robbing nature, while land is the object of such action.

The same issues arise in classical theory. Production is conceived as the application of a set of instruments, including human labor, which is juxtaposed against the goal of the agent. Marx, for instance, Marx presents the “labor process” (i.e., production) as the extraction of surplus, where the agent is separated from one's own

labor power.¹⁰ Thus in the classical tradition too, the agent is divided into the “end” and the “means.” The means include the environment as well as the skill and tools of the laborer.

7. What is Missing in the End-Means Dichotomy?

The end-means dichotomy is a useful approximation particularly in engineering projects. It allows the engineer to evaluate one action as opposed to another while assuming that means are external to the end. However, means cannot be given. They are part of the evolving capacity of the actor. This capacity is evolving because action, any action, is a creative act which leads to the development of the actor (Khalil, 1997a). While the ends-mean dichotomy is useful for some engineering problems, it cannot be used if we are interested in understanding the evolution of capacity. The dichotomy treats capacity as, first, a well-defined substance and, second, as part of other elements that make up the environment which confronts the agent. The problem in this picture is the radical split of the actor into two halves, where the end or mental images are set apart from the agent’s capacity.

In this manner, the end-means dichotomy cannot allow us to understand entrepreneurship. The end-means dichotomy does not allow us to see the agent as an organism—a conception needed if we want to understand evolution or creativity, at least as related to everyday action.

If we need to explain entrepreneurship-qua-creativity, the entry point of theorizing should be the actor as a whole, i.e., the unity of the end and the means—where the means here are limited to the set of tools of production. That is, the set of tools does not include the environmental nutrients and minerals that the agent wants to extract. In this manner, with an organismic view of the actor, the tools of production would be seen as inseparable from the end, whether it be utility/profit (neoclassical theory) or surplus (classical theory). If the goal is to explain action in the most fundamental sense, the dividing line should be drawn differently. It should not be between the end and

the means, but between the organism, or “actor,” and its environment, which it robs.

Such a view is not permitted in the neoclassical notion of scarcity or efficiency. According to the neoclassical view, resources are given in a basket and, hence, do not need to be robbed. The resources only need to be re-arranged in the most optimal way. That is, for neoclassical theory, the problem is how to re-arrange the given resources of a basket so as to meet a particular criterion, such as the optimization of utility. However, if the economic problem is defined as one of survival, the agent would focus on how to rob nature to obtain the basket of goods in the first place.¹¹

Interestingly, Whitehead uses the expression “robbery” to describe the ecological relation between the actor, or “living society,” and the environment:

Another characteristic of a living society is that it requires food. In a museum the crystals are kept under glass cases; in zoological gardens the animals are fed. Having regard to the universality of reactions with environment, the distinction is not quite absolute. It cannot, however, be ignored. The crystals are not agencies requiring the destruction of elaborate societies derived from the environment; a living society is such an agency. The societies which it destroys are its food. This food is destroyed by dissolving it into somewhat simpler social elements. It has been robbed of something. Thus, all societies require interplay with their environment; and in the case of living societies this interplay takes the form of robbery. The living society may, or may not, be a higher type of organism than the food which it disintegrates. But whether or no it be for the general good, life is robbery (Whitehead, 1978, *PR*) p. 105).

So, if the robber’s components, such as labor and tools, cannot be included in the environment set which the robber wants to rob, then

what does the environment set include? It includes components that are external to the actor, such as the weather, raw materials, physical laws of nature, market fluctuations, property rights, conventions about standards of measure, and so on. However, contents related to the ability of the actor, which are misplaced as part of the constraint function in neoclassical and classical economics, should be placed in the “actor” set. Such contents include human capital such as health, biological capacity, and produced tools of production used by the actor.

The actor set, as summed up in Figure 3, is broader than the “end” set in neoclassical and classical economics. The actor set includes, besides utility/profit, surplus, and desires such as self-aggrandizement, labor capacity and its tools.

The Actor: Utility/profit/surplus <i>and</i> capital/labor/land in the sense of tools of production	The Environment: Land in the sense of nutrients and minerals
End: Utility/profit (neoclassical theory) Surplus (classical theory) Self-aggrandizement (Schumpeter)	Means: Capital, labor, land (neoclassical and classical theories)

Figure 3: What is the Proper Dividing Line?

There are serious differences between the neoclassical and classical/Austrian views of what constitutes the “end.” The neoclassical, or interactional, view presents action as the result of the interaction between the actor’s end and the given means in the sense of incentives. The classical/Austrian, or self-actional, view, presents action as the expression of the self—either as a norm, type, or desire. Despite the differences, either view splits the actor apart. One part—the mental—either optimizes along neoclassical theory or executes action according to norm, type, or desire along classical/Austrian theory. The other part—the means—is used to attain the end.

7. Conclusion

The proposed actor-environment partition is not a dichotomy as in the vitalist living/nonliving or human/nonhuman distinctions. The actor-environment partition does not suppose that a new element is introduced into nature with the emergence of life on Earth or with the emergence of humans. Rather, the proposed actor-environment partition is an ecological observation of where the boundary lies if the focus is on survival of the organism.

In the proposed actor-environment partition, the actor is not split in half as in the case of the end-means dichotomy. The actor-environment partition complements the philosophy of the organism as proposed by Whitehead. The divide reaffirms the unity of the actor.

To note, such a unity is not based on some homogeneous conception of the actor. The actor is rather made up of many subordinate actors, each of which, in turn, is made up of other subordinates. For instance, an organism is made up of organs, organs of tissues, and tissues of cells, and so on. Each actor in this hierarchical complexity seeks its own goal. On the other hand, this should not mean that the actors within the hierarchical complexity are pitted against each other. Rather, they should be seen as involved in a cooperative enterprise according to the general plan of the organism. As Whitehead puts it:

The concrete enduring entities are organisms, so that the plan of the *whole* influences the very characters of the various subordinate organisms which enter into it. In the case of an animal, the mental states enter into the plan of the total organism and thus modify the plans of the successive subordinate organisms until the ultimate smallest organisms, such as electrons, are reached. Thus an electron within a living body is different from an electron outside it, by reason of the plan of the body. The electron blindly runs either within or without the body; but it runs within the body in accordance with its character within the

body; that is to say, in accordance with the general plan of the body, and this plan includes the mental state. But the principle of modification is perfectly general throughout nature, and represents no property peculiar to living bodies (*SMW*, 79).

The proposed actor-environment juxtaposition is most necessary if we want to account for creativity. For one thing, it can explain why the actor undergoes creative development. In the proposed juxtaposition, the actor can never be a substance, i.e., an entity that is well-defined. The ability of the actor is not an instrument to serve an end external to it. Further, when the actor relates to the environment, it is the actor as a whole that is involved. The actor is fundamentally unified as it tries to rob resources from the environment.

It seems also to be the case that an explanation of creativity is Whitehead's main focus (e.g. *AI*, 181-82). Whitehead wanted to situate creativity or novelty in nature. He understood the organism broadly to include non-living organizations (such as atoms and molecules). In this manner, he avoided the opposition of mechanistic nature and freedom, which is the root of the body/mind problem (see Rose, 2005). But we need not go into these far-reaching and deeper concerns of Whitehead. For the question of economic theory, the organism-environment divide allows us to see creativity as part of action. Everyday action is one and the same as entrepreneurial action.

One must remember that the environment includes organisms that are conspecifics and that may cooperate with each other. If they do, an order of society can arise, with neighborhoods or markets. This order of the market should be carefully distinguished from a different type of order, the order of the super-organism, in which an agent is a member of larger organism (see Khalil, 1990, 1998-99). But for our purpose here, it is sufficient to state that we are not dealing with relation of submission or authority that occasions the super-organism. Rather, the relation under focus is between the organism and the external environment, which may or may not give rise to orderly

patterns such as the market or traffic flow. But we need to start with the relation of the organism to the external environment, rather than the market, if we want to analyse the challenge that faces the organism. Such a challenge might be the basis for the decision to submit to authority and, hence, be part of a super-organism, such as the firm.

In its relations with its external environment, the actor as an organism is a unified unit subsisting on its environment. Such actor-environment juxtaposition is useful insofar as it provides an account of creativity, which the substantivist view underpinning the end-means dichotomy cannot. The actor-environment juxtaposition highlights that the actor's main challenge is to remain acting, i.e., remain in the game of survival. As such, the actor is not mainly trying to maximize an output while assuming its' own ability as a given. Rather, it acts because if it does not it will not be able to maintain its own organizational cohesion. In this regard, the actor is not a substance but rather sees itself only in relation to the environment. The main unit of analysis here is the relation between the actor and its environment.

Such an organismic view affords an endogenous account of creative action and the rise of novelty. When the actor acts, the actor acquires a new ability or knowledge. Also, the environment upon which the actor acts undergoes change because of its action. The transformation of the environment ensued here differs from the stochastic fluctuation of the environment that may take place for other reasons. But even if the environment remains the same, the actor experiences it differently because of the knowledge or ability which the actor acquired in the process. Therefore, the theory of action is also a theory of creativity, and the theory of creativity is also the theory of action.

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Notes

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² The evolutionary change can be “micro” if it involves the improvement of the skill of catching fish with bare hands or the improvement of the skill of catching fish with a sharpened tree branch. The evolutionary change can be “macro” if it involves the movement from the use of bare hands to the use of the sharpened tree branch. There should ultimately be no difference between micro- and macro-evolution. But this is a subject outside the focus of this essay.

³ I am aware of only one economist, Nicholas Georgescu-Roegen (1972) who seriously studied the notions of creativity, novelty, and evolution in the Whiteheadian process tradition. Unfortunately, whatever Whiteheadian insights Georgescu-Roegen gained, he confused them with the entropy law (Khalil, 1990a). Put succinctly, Georgescu-Roegen thought that the irreversible increase of entropy in a closed universe is identical with Whitehead’s understanding of evolutionary change as the appearance of novelty.

⁴ In case the economy consists of more than one commodity, the variables S, O, and I must have the same metric. Marx developed a theory of value, his “labor theory of value,” to provide such a metric. Marx’s metric ran into many problems, the most famous of which is the “transformation problem” (Foley, 2000). Ricardo, followed by Sraffa, developed a different metric, a composite index of value, which avoids the transformation problem (Steedman, 1977). We need not discuss the controversies surrounding the appropriate metric.

⁵ In some sense, my earlier essay (Khalil, 1997a) can partially be characterized in the vitalist, classical economics tradition, where agents are portrayed as motivated by self-competition: they try to excel beyond their previous achievements.

⁶ See Samuel Hollander (2004) for a closely related observation of the similarity of Marx's and von Mises's views of the actor.

⁷ In a sense, my earlier essay (Khalil, 2003b) offers a Deweyan view of entrepreneurship where agents, empowered by different perspectives, see the same substance differently.

⁸ The same identical substantive metaphysics underpins neo-Darwinian evolutionary theory which hinders it from advancing a developmental view of evolution (Khalil, 1993).

⁹ The use of the term "rob" is not accidental. It is a term used by Whitehead, and it is used here to stress that the economic problem is ultimately about survival, for the actor must rob the environment in order to maintain himself. This is a common view in ecological science and ecological economics (Khalil, 1997b).

¹⁰ 1976, Chapter 7. Marx strongly differentiates the "labor process" of humans from the labor activity of insects. For humans, the act of production involves the mental conception of the process which is supposedly prior to execution. For insects, there is supposedly no such mental representation. Insects simply act according to their given nature. So, for Marx, human mentality clearly stands outside nature. Such a view asserts a non-bridgeable gulf between mental conception and action, as if both were separate substances. Given the classical definition of the economic problem as the production of surplus, Marx is forced to adopt the substantivist view, and in particular the dichotomy between action and conception of the action (see Khalil, 1992). Marx is forced to adopt such a position in order to argue that diverse human activities, such as tailoring and carpentry, can be compared because they are mere instances of the same substance, viz.,

homogeneous in terms of the abstract mental component which Marx called “abstract labor.” Using concept of “abstract labor,” Marx was able to the metric to account for the surplus. Even if the agent were Robinson Crusoe, where he undertakes all different specializations during the day, at the end of the day he would still have to calculate the surplus. To do so, he must use a metric that allows him to add the diverse activities spent, e.g., on hunting as opposed to fishing. If there is no abstract substance underpinning the diverse heterogeneous acts of labor (which Marx called “concrete labor”), how can the agent know whether he is producing a surplus? So, to produce a surplus, the agent must treat his labor as something external to himself—as an instrument that can be calibrated by an engineer and can tabulated along a ledger of costs that stand apart from the end.

¹¹ It is obvious that the actor should not rob his own tools of production—such as his health, limbs, physical capital, and so on—in order to survive. For instance, the actor should avoid addictive substances if he wants to maintain his health or, in general, his “human capital.” Although this point is obvious, the end-means dichotomy entails that the actor could rob his own human capital if it maximizes his utility. His human capital is part of the means to be exploited. In fact, in his model of addiction, Gary Becker (1996) portrays addiction as no different from entrenched habits of consumption, such as the habit of partiality to a particular music. The term “rob” is used to stress that we should include the means of production in the actor set rather than in the set to be robbed.