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Title: The Policy Ramifications of Capital as Ideas

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Abstract: In 1987, Baldwin Ranson wrote about capital and technology in economic growth. Ranson argued capital should be defined as intangible ideas and technology that are not subject to supply and demand constraints. Veblen described his conception of capital as, "it is found in possession of something in the way of a body of technological knowledge – knowledge serviceable and requisite to the quest of a livelihood" (Veblen, pg. 518, 1908). Commons wrote in a similar vein, stating, "capital is not the accumulation of past produce of stored up labor – these are transitory and aimless – capital is a going plant of industrial knowledge and experience" (Commons, pg. 662, 1934). More recently, Cesar Hidalgo (2016) and Paul Romer (1990, 1993) have also written about the idea of capital as ideas and the key to economic growth. Hidalgo wrote that, "so the growth of information in the economy results from the coevolution of our species collective computation capacity" (Hidalgo, pg. 178. 2016). The first section of this paper explores the linkages between the older generation and more recent thinkers on the intersection of capital as technology and ideas. The second section of the paper than explores the policy ramifications of this conceptualization of capital. Romer argues that temporary monopolies are needed to encourage investment in innovation. Veblen and Ranson argue that these rules do not allow for the full social value of ideas to be utilized. The second part of this paper explores these differences using A. Allan Schmid's Situation-Structure – Performance model (SSP).

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Introduction

Thorstein Veblen wrote several articles about capital and technology over a 100 years ago. Veblen wrote in the article "The Nature of Capital" in 1904 that, "the information and proficiency of the ways and means of life vests in the group at large…it may be called the immaterial equipment or by license of speech, the intangible assets of the community" (Veblen, 1904, pg. 518). He identifies later that knowledge is in some part individual based but to be useful must be used in the community context. Individual knowledge does very little good on its own, especially in more technologically advanced societies. In these articles, Veblen was stating that rather than thinking of capital as machinery and equipment, capital was really about intangible ideas and knowledge held by the community at large.

Building partly on this legacy, Baldwin Ranson in 1983 and again in 1987, wrote about the issue of capital and capital formation from the institutionalist perspective in the Journal of Economic Issues (Ranson, 1983, 1987). Ranson argued that the traditional, neoclassical model required savings to drive economic investment and growth. In other words, society had to sacrifice consumption today to drive higher consumption in the future via investments in physical capital.

In this first piece in 1983, Ranson discussed the big changes that started occurring in thinking about capital and technology via Veblen and Keynes in the early twentieth century. Both argued, in different ways, that the idea that savings and sacrifice were necessary for growth and investment was wrong. Ranson also pointed to John Fagg Foster as crucial in the development of this thinking. Foster argued that the "money" for capital investment and technological change comes not from foregone consumption but rather from the creation of money and credit via banks and the government (Ranson, 1983).

In 1987, Ranson again picked up these themes and expanded on his original article. The neoclassical economists argued that land, labor and capital were the three factors of production. Capital can only be financed in this view by foregoing consumption and saving money. In the traditional view, capital is a factor of production that is represented by machines and other equipment. Ranson argued that in fact capital represents intangibles and in particular ideas and knowledge about how to do things. Thus, capital formation is not about "getting more stuff" but learning and generating new ideas on how use material items. The implications of course of this new idea are that generating new ideas is not about foregone consumption (savings) but rather about stimulating new thinking (Ranson, 1987).

Since the writing of the 1987 Ranson article, many important changes have occurred in economists' thinking about growth, development, technology and capital. Most notably, the new growth theory or endogenous growth as pioneered by Paul Romer has emerged. This article seeks to update Ranson's work to determine what we have learned and what advances have been made in the last thirty years and whether they alter at all Ranson's findings.

Current Thinking on Capital Formation and Savings

The first question to ask is whether the ideas about capital that Ranson criticized about in the 1980s' still exist in today's popular press and literature. The evidence suggests that they still exist as the following examples demonstrate.

The Hudson Institute wrote that, "the U.S. economy is reaping some deleterious effects sowed by decades of weak capital spending. Since the 1970's, the compound annual growth rate in nonresidential fixed investment has plummeted" (Kravis, 2017). For another example, the Committee for Responsible Federal Budget also discussed these issues. They wrote that, "we estimate that in order for the economy to grow at a sustained annual rate of 4 percent solely by growing capital investments, capital would need to grow at almost quadruple current projections" (CRFB, 2017).

Groups such as the Aspen Institute have laid out a model that a low U.S. savings rate represents a threat to long-term economic growth. In their report, they argue that whether the U.S. will have to rely on foreign savings to boost investment in capital goods and growth or face much slower growth over time. They specifically state that "a higher level of household saving enables an increase in the nation's physical capital stock growth more quickly and the economy is able to maintain a faster pace of growth" (Aspen Institute, 2009). These ideas are nearly identical to those critiqued by Baldwin Ranson in the 1980's.

Advances in Thinking about Capital and Technology: New Growth Theory

Since Ranson's writing in the 1980's, Paul Romer and others pioneered a new set of approaches to economic growth and the role of technology and knowledge. Romer's (1990, 1994) model is based on a fairly traditional idea of human behavior based on far- sighted rational decision making. Firms are envisioned to profit-maximizers who are able to take out an infinitely lived patent on any new invention they derive from research (Romer, pg. S86). Romer settled on an economic model that allowed the innovating firms to generate monopoly profits.

Romer makes an important distinction in his model between human capital and knowledge. He argues that human capital, identified as ideas and knowledge in one's head, is based on a concept of rivalry stored as neurons and connectors. At the same time, knowledge written down or codified in any form is nonrival and can be used without losing its inherent value. At this point, Romer states that "human capital is almost perfectly excludable". It appears then that in fact there are cases where exclusion is not policy based but inherent to the situation or characteristics of the economic good. These critical concepts are similar to ones employed by Veblen and remain crucial to Romer's narrative.

Romer was able to reconcile a decentralized solution with market power via the nature of knowledge creation and use. Romer clearly states in his 2015 piece that nonrivalry is a key characteristic to any knowledge good. At the same time, he argues that partial excludability is a second important element. The combination of partially excludability and nonrivalriness implies that an "impure' public good situation exists. Romer treats this as a natural and defensible assumption. He writes that, "Rivalry and its opposite nonrivalry are assertions about production possibilities; excludability depends on policy choices about rules" (Romer, 2015).
This unique situation allows the inventing firm to make money while allowing the general knowledge of new inventions to be in the public domain.

Previous authors had to live with invention and knowledge being a pure public good and were unable to then explain the creation of knowledge as driven by individual incentives. Romer writes that, "both spillovers and price setting seems essential to capturing the features of

knowledge" (Romer, 1990, pg. s89). Romer writes that in fact a model of perfect competition is simply not compatible with an innovation driven economy.

Recently, Cesar Hidalgo (2016) also tackled the question of the nature of knowledge and information and their role in economic growth in his book. Hidalgo uses the concept of "personbyte". The term is meant to connote that any individual person has a limit to the amount of information and knowledge that can be accumulated. Hidalgo wrote that, "define it as the maximum knowledge and knowhow carrying capacity of a human (Hidalgo, 2016, pg. 82). It should be noted that Hidalgo's conception of personbyte is very similar to the idea articulated by Veblen nearly 100 years ago.

In chapter one of his book, Hidalgo focuses on the key idea that physical objects embody information. Often in economics, information is conceived of in intangible terms. Veblen thought in the same fashion as he wrote, "it is a knowledge of ways and means, and is embodied in the material contrivances by means of which members of the community make their living" (Veblen, 1908, pg. 521). A strong correlation can be observed between Veblen's conceptions of knowledge and capital and Romer and Hidalgo's and the idea that capital is not "stuff" but rather intangible ideas and knowledge.

Veblen and New Growth Theory: Similarities and Differences

Several authors have already noted some important similarities between Romer's and others work in new growth theory, and Thorstein Veblen's ideas about capital and ideas. McCormick (2002) argued that both Robert Lucas and Paul Romer, progenitors of new growth theory, treat capital and knowledge in an identical way to that of Veblen. The key point of distinction between new growth theory and Veblen lies in the treatment of the monopoly owners of capital. McCormick, like many others, emphasizes that in Veblen's view, capital goods are in conjunction with people using knowledge, and in and of themselves are not useful or productive (McCormick, 2002, pg. 266). In a very keen observation, he writes that, "a computer for example is completely useless to a society that doesn't know how to use it" (McCormick, 2002, pg. 267). He writes that, "but that they do not yet see how technological change both requires and fosters changes in how people see the world" (McCormick, 2002). McCormick (2002) for example argues that Romer and others in the endogenous growth theory missed the fact that technological change leads to changes in social structures and outlook. These subsequent changes are not captured in endogenous growth theory. This insight is certainly an on-point comment, however there are other elements to the differences between Romer and Veblen that bear mentioning.

A key difference between Veblen and Romer is each author's view of human nature and motivation. New growth theorists take a very neoclassical view of human nature, the very view criticized by Veblen in his own works. In contrast, Veblen uses his theory of instincts and habits to explain human behavior and motivation. Veblen argued that the instinct of workmanship and even idle curiosity drove human behavior and not the benefit and cost calculation of the utility or profit maximizer. So, while similarities exist between Romer and Veblen, there are important distinctions at a very fundamental level in behavioral theory.

The differences in human motivation are not trivial matters but likely drive a wedge in the types of implications we can draw from these two contrasting approaches to capital as ideas. With Veblen, there is no sense that the need for monopoly rights over ideas is necessary to motivate the drive to innovate. Veblen remained more concerned about the ability and willingness of business persons to capture the scarce material equipment and machines necessary in the industrial age to utilize ideas.

Framework for thinking about Veblen and Romer

It has been argued that Veblen, Romer and Hidalgo share many important insights regarding the nature of capital as intangible ideas rather than physical objects and their role in economic growth. Less clear is where the differences lie and the implications of those differences for policy conclusions. A. Allan Schmid made some important contributions in understanding of the inherent interdependence brought on via public goods (public goods was a term that Schmid wished would be eliminated). Schmid (1987) focused on what he termed the physical nature of the goods in inquiry and how these created interdependence between parties. He also acknowledged over time that these interdependencies could change via technology. For the short term however, Schmid kept the nature of the interdependence as exogenous and fixed in the model and varied institutions or structures to determine performance or outcomes.

Schmid's framework has been termed SSP for Situation, Structure and Performance which he borrowed from industrial organization. The term "behavior" could also be introduced to create SBSP. With this framework, the analyst must first identify the situation or the nature of the interdependence between parties, the underlying behavioral assumptions to be used, the structure or set of institutional rules that apply and the performance or indication of the distribution of impact across part.

Situational variables include the classes of interdependencies given technology and psychology. Situation includes attributes of (1) individuals (preferences, values, ends in view; knowledge of the rules and productions functions; and information processing and decision strategies), (2) the community (number of decision makers, and the degree to which individual characteristics are shared) and (3) goods (the good's characteristics determine how one person's actions can potentially affect the welfare of another person). Different inherent characteristics of goods create different contexts of human interdependence and thus the same institution or right can result in a different performance when applied to goods having different characteristics. (Schmid, 1987, p. 39)

SSP forces specificity and precision as to the "good" where generally economic theory has for the most part regarded goods as homogeneous. Schmid (1987) asks us to treat each "good"/"idea" discreetly. This requires thinking beyond the ownership of the factors of production and the conditions of a competitive market.

This Schmid framework allows us to better understand the similarities and differences between Veblen and more recent authors such as Romer and Hidalgo. In terms of situation (S), the three authors seem to agree that capital is intangible ideas or recipes rather than physical items. They also at least partially agree that there is a common stock of nonrival knowledge and ideas that exists in society are necessary for innovation and the growth of ideas. Romer and Veblen differ in their views on expected performance (P) which is the growth of new ideas. Romer believes

that new ideas will only come from the ability of firms and individuals to have a monopoly and generate rents or excess profits. Veblen on the other hand does not view this as necessary and in fact, especially from the viewpoint of more recent interpretations such as Ranson, view these policies or institutions as harmful. The key point of divergence is in the behavioral assumptions (B) between the two authors.

Policy Implications and Concluding Thoughts

A key question in the debate over technology, knowledge and capital is its ultimate relationship to economic growth. Many economists and popular writers today, writing under the influence of Romer and before him Arrow and Solow, write that new technology and new ideas are the key to long term economic growth and welfare. The question naturally turns to the process through which new ideas, knowledge and ultimately technology are spurred forward in an economy. An intermediate step, before the question of economic growth can be answered, is the issue of the policy choice to create a system of property rights to knowledge and ideas.

At one level, it appears that Veblen and newer authors such as Romer and Hidalgo are on the same page regarding the nature of knowledge and new ideas. However underling those possible similarities lies an important set of differences that pose very different policy implications. Romer and the neo-Schumpeterian approach clearly point to the fact that system of temporary or permanent monopoly rights is necessary for technology and ideas to translate into economic potential.

Alternatively, Ranson made the argument that supply and demand concepts did not apply to technology and capital and their role in economic growth. In this frame of reference, the notion that money or issues related to supply constraints on technological change are irrelevant and in fact used to stall the further development of the economy for pecuniary reasons. While Veblen did not propose specific policy measures, Ranson wrote, partially based on Veblen's ideas, that society should control debt creation and the role of investment managers should be to invest in universal free access to education and training. This thinking stands in stark contrast to the arguments used in the new growth theory.

At one level, Veblen and Romer seem to agree on the nature of capital as intangibles and in particular they are composed of ideas and knowledge about how to produce, use and organize material items. These similarities may lead one to imagine that the policy conclusions would also be similar. However, the motivations underlying the drive to innovate are quite different for each author. This implies very different policies regarding the legal and customary treatment of ideas and knowledge. Romer's model relies on the concept that legal protections exit to ensure that innovators have financial incentives to act.

Veblen and his incorporation of instincts and habits does not envision the need for these types of protections. Veblen can be interpreted as arguing that instincts and habits such as workmanship and idle curiosity will drive the human behavior towards innovation and technological change. In the Veblen narrative, there is no need for secrecy or patents and trademark laws. Humans will be driven to innovation and in fact secrecy is harmful and unnecessary.

One lesson from this analysis is perhaps one must carefully compare and assess differences in the structure, behavioral motivations and situational categorization under consideration. The Schmid model or framework helps us view or understand where key points of difference may lie. In terms of the situation, there is apparent similarity in conception that capital as ideas are nonrival but partially excludable, although on this last point Veblen is less clear. The institutional structure is a key question and here Romer is explicit that he argues for partial excludability. On behavioral assumptions we see a wide divergence.

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