

Joseph Schumpeter and His Legacy in Innovation Studies

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Inspired by the recent rediscovery of work of Schumpeter in science and policy-making the author reviews and appraises Schumpeterian theory and that of his followers in innovation studies. Although Schumpeter's vision suffers from some defects, I argue that there is more to learn from this author than his well-known idea of "creative destruction". In particular, Schumpeter's view on innovation policy is something that may have vital relevance to today's increasingly policy-dominated world. We therefore conclude that besides his key ideas on innovation-led development also his policy view should be regarded as a significant legacy in innovation studies.

If there is one deceased social scientist whose echo speaks to us today, it is the Austrian-American scholar Joseph Alois Schumpeter (1883–1950). The knowledge economy we are witnessing now has even urged some commentators to proclaim the 21st century "the age of Schumpeter" (Giersch, 1984; Helmstädter and Perlman, 1996; Cantner and Hanush, 1999). Witnessed by recent books, papers and policy documents, it would seem that authors and policy makers have rediscovered Schumpeter and his innovation theory as fruitful starting points for their work (see e.g., Foster and Kaplan, 2001; Cooke, 2002; European Commission, 2003). Often, the famous Schumpeterian catchword "creative destruction" is presented and referred to in pointing to the importance of entrepreneurship, technological development and innovation policy for economic development. Mostly, however, that is the end of the matter. In our view, by only briefly mentioning Schumpeter we do not do full justice to the depth and breadth of his work. For this reason, the paper at hand aims to review and appraise Schumpeter's *oeuvre* and that of his followers. As we shall see, Schumpeterian theory reflects the temper of these days; moreover, there is more to learn from Schumpeter than merely his classic argument of "creative destruction".

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In assessing Schumpeter's legacy for today, I have largely focussed on his writings on innovation and economic development in the capitalist system, thus covering his major works and articles. In addition, I have tried to shed some light on his view on policy matters—a theme Schumpeter was reluctant to deal with and that consequently has been neglected in the literature. The paper is structured in the following way. First I briefly place Schumpeter among his intellectual predecessors before explaining his "vision"—to use his favorite term—on innovation and its role in economic and societal development. Next, the focus is on modern Schumpeterian theory as it developed from the author's original writings. This is followed by an appraisal of the Schumpeterian approach. Thereafter I turn from theory to policy; in this respect, I deal with the nuanced view Schumpeter holds on economic policy in general and innovation policy in particular. It is here, I think, that the main relevance of Schumpeter's work for today can be found. His theory not only suggests an explanation for the omnipresent copycat behavior among policy makers in charge for innovation, but also warns against too much faith and generalization in propagating public policy measures in the field of innovation.

Schumpeter and His Predecessors

The Austrian-American scientist Schumpeter stands out, especially in the economics profession, because of his clear eye regarding the importance of institutions and technology for economic life (see the box below for a short account of Schumpeter's life and work). He was not the first one adhering to this alternative view though. In criticizing the static and universal character of neoclassical economics, he followed in the footsteps of other (groups of) scholars. Authors of the 19th century German historical school such as Roscher, Schmoller and List argued that economic laws were invariably contingent upon their historical and institutional context. Though both a German and a broadly oriented economist, Karl Marx was not a member of this school. Rather, he insisted on the major consequences technology would have for the labor relations in the capitalist economy. His labor theory of value points to the exploitation of workers and the downfall of the capitalist system through the surplus value the capitalist producers would appropriate. The idea to integrate contextual issues in economic analysis was fully embraced by the American institutionalists in the late 1880s. Veblen and his followers, for example, proposed a heterodox evolutionary approach to economics. They particularly focused on habits, routines, learning and technology as factors shaping and hampering economic change. Just like their German colleagues, the American institutionalists were describing rather than analyzing the economic process (Coase, 1984; Van der Steen, 1999). Due to the lack of systematic logic their work has been largely neglected. By contrast, Schumpeter is receiving more and more attention at the moment in the economics profession. Perhaps this is because Schumpeter did more than merely criticizing mainstream economic theory: instead, he tried to reconcile it with heterodox views by developing a synthesis.

Before turning to the vision of Joseph Schumpeter, I refer to two intellectual influences in his life, Léon Walras and Karl Marx. The French economist Walras constructed the famous general equilibrium model that has been the workhorse for generations of neoclassical economists. In models of this type, the underlying func-

tions are aggregate functions and thus can be seen as the summation of all individual participants in the market. Although Walras' approach was static and context-free, Schumpeter borrowed from him the idea that the economy should be seen as an interdependent system of economic quantities, such as prices and volumes. In Schumpeter's view this was a brilliant insight, and for that reason he ranked Walras as the number one among economists (Schumpeter, 1937). Schumpeter's opinion regarding Marx was ambivalent. For one thing, he did not agree with Marx's specific analysis of capitalist evolution. Marx predicted that the capitalist system would collapse due to its failure, and not, as Schumpeter insisted upon, as a result of its success. For another thing, Schumpeter admired Marx's dynamic and institutional view on the economic process. Following the metaphor used by Smithies (1950), one therefore might say that Walras provides the foundation of the Schumpeterian building, while Marx suggests Schumpeter the method he could use to erect the theoretical construction indeed.

The Life and Work of Schumpeter

In the year of Marx's death, Joseph Alois Schumpeter (1883–1950) was born in Triesch (Czechoslovakia) as the son of a cloth manufacturer. After his studies in law and economics in Vienna, he soon earned a professorship at the University of Graz. Before the First World War he wrote three books there. The most important of these was the work *Theorie der Wirtschaftlichen Entwicklung* (1912). This book, which was translated into English in 1934, established his reputation as a renowned economist. Between 1919 and 1925 Schumpeter tried his luck as a politician—he acted as a finance minister in the Austrian government—and as a banker, but both enterprises failed (Swedberg, 1991a). He was happy therefore when he could become a professor at the University of Bonn. In 1932 he migrated to the USA, where he taught at Harvard University until his death in 1950. Meanwhile, he also served as a president of the American Economic Association. Besides a heavy teaching load at Harvard, he found time to write three massive works: the two-volume work *Business Cycles* (1939), the more popular *Capitalism, Socialism and Democracy* (1942) and the monumental *History of Economic Analysis* (1954). This last book was edited by his wife and published posthumously in 1954. Schumpeter wrote in German and English, and his work is still closely studied. The “International Joseph Alois Schumpeter Society”, for example, organizes conferences and publishes books to carry forward the work of this eminent scholar.

The Schumpeterian Vision

It is in the preface to the Japanese edition (1937) of *The Theory of Economic Development* (1912) that Schumpeter very clearly stated his ambition as an economic scientist: “There must be a purely economic theory of economic change which does not merely rely on external factors propelling the economic system from one equilibrium to another. It is such a theory that I have tried to build.”¹ A theory of economic change is needed, Schumpeter argues, because Walrasian gen-

eral equilibrium thinking can only explain the “stationary process”, i.e., the circular flow of resources in an existing economic system. Still, Schumpeter uses this model as the starting-point of his dynamic analysis, as it shows how a capitalist economy would behave *in the absence of* what he sees as its most essential feature: constant evolution.

At this point, Schumpeter agrees with Marx that capitalism is an “evolutionary process”. The economic system incessantly changes in historical time; firms and industries start up or die out, markets are opened up, new technologies are introduced and so on. According to Schumpeter, the main force that brings about this structural change is the “perennial gale of creative destruction” (Schumpeter, 1942). This process refers to the waves of innovative activity that hit the economic system in different points of time, resulting in the destruction of the old economic structure and the creation of a new one. Thus, Schumpeter (1919) sees the introduction of innovations, that is “the carrying out of new combinations” as the key process of economic change. He mentions various types of innovations: the introduction of new products, new methods of production and new forms of business organization as well as the penetration of new input—and output markets. Innovations are more than just small changes put together: “Add as many mail-coaches as you please, you will never get a railroad by so doing” (Schumpeter, 1940). Instead, for Schumpeter, innovations are “new combinations” that disturb whatever equilibrium exists in the economic system.

Innovations do not just occur but always will have their basis in the pre-existing economic structure: “The economic system will not change capriciously on its own initiative but will be at all times connected with the preceding state of affairs” (Schumpeter, 1934). But what induces the structure to drift? That is entrepreneurial innovation, asking for acts of entrepreneurship, i.e., heroic efforts of “new men” to break the circular flow of existing activity. An entrepreneur is more than the neoclassical *homo economicus*. Innovation is not a result of rational decision-making, but a creative pioneering process characterized by environmental uncertainty, personal imagination and expectations. As entrepreneurs innovate rather than invent, they are “first movers”, a position rendering them temporary monopoly power with associated huge monopoly profits. In turn, the profits entrepreneurs make attract imitators. This tendency of economic actors to imitate successful entrepreneurs also explains the wave-like movements of innovative activity in “competitive capitalism”, Schumpeter argues. Since the appearance of a risk-loving entrepreneur creates a favorable climate for others who are less venturesome, an upswing in economic development occurs.

But not forever: as the chances for making profits are eroded by imitation of the original innovation, an economic boom is followed by a downswing. In other words, innovations tend to appear and disappear in “swarms” or “clusters”. The length of the cycles of innovative activity depends upon the degree of creative destruction the innovations in question induce. In his book *Business Cycles* (1939) Schumpeter shows with the help of a mass of historical material that the system of ‘competitive capitalism’ shows three types of cycles: the three-year Kitchin cycle (inventory (de)accumulation), the Juglar cycle lasting 8–11 years (individual innovations such as the dynamo) and the 50–60 year Kondratieff cycle (major innovations such as the railroad). In short, in the Schumpeterian vision economic ups and downs just

represent processes of adaptation of the capitalist engine to new circumstances. Innovations disrupt the equilibrium to which the economic system tends—the resulting cycles are the attempts of the system to attain a new equilibrium.

To understand capitalism, studying economic theory and economic history do not suffice, Schumpeter asserts. There is an obvious interaction between economic change and the economy's institutional framework. Here, economic sociology comes in. In one of his last writings Schumpeter (1950) defines "institutions" as "all the patterns of behaviour into which individuals must fit under penalty of encountering organized resistance and not only legal institutions (such as property or the contract) and the agencies for their production and enforcement". In the case of capitalism, the institutions are all geared to the system of private enterprise. In his *Capitalism, Socialism and Democracy* (1942) Schumpeter explicitly deals with the links between economic and institutional change. In the long term, he says, capitalism will dig its own grave for institutional rather than economic reasons. To start with, as a result of the "rise of big business" capitalist institutions like entrepreneurship and private property gradually will disappear. As firms grow larger, laboratory research by teams of trained specialists and bureau work by managers will replace the entrepreneurial function.

In addition to this 'routinization of innovation' the property rights of firms are spit up more and more. In the end, nobody will know which part of the firm he owns, thus killing the roots of capitalist motivation. Next, Schumpeter foresees an increasingly hostile attitude towards capitalist society. "Capitalism inevitably and by virtue of the very logic of its civilization creates, educates and subsidizes a vested interest in social unrest" (Schumpeter, 1942). Intellectuals play a decisive role here. The educational apparatus associated with capitalism turns out white collars workers who earn their living mainly by the spoken and written word. These intellectuals are outsiders looking in: as they do not have responsibility for practical affairs, they cannot but live on criticism to the very system that has produced them.

Finally, capitalist activity involves growing government intervention, like tax policies, anticyclical public expenditure, labor legislation and other types of regulation that might frustrate entrepreneurship. This does not mean that Schumpeter does not see any role for government in capitalism. The only principle that counts for him is that the economy is kept open for change, which always asks for a thorough case-by-case assessment. From this perspective, any intervention by the state, varying from sectoral subsidies to less strict monopoly laws in an the stage of an industry's life cycle, might be justified. Thus, Schumpeter argues, there is no general advice for policy makers to give, although they would love to have it.

In sum, due to the rise of big business, discontented intellectuals and government interventions the walls of the capitalist building are crumbling more and more. Ultimately, says Schumpeter, the system of competitive capitalism may even turn into a socialist system ("state capitalism") in which only a few huge corporations will run the economy in an efficient but mechanical way. Thus, he believes, it is the very success of capitalism that sets the stage for its "march into socialism". Schumpeter does not indicate exactly the moment at which capitalism has destroyed itself. But he suggests that a century is only a "short run" in this context (Schumpeter, 1942). This corresponds with his general view that institutions tend to persist after they have lost their rationale. Institutional change is difficult and may slow down

the process of economic change. What is more: “the discrepancies between the two are among the most important explanatory factors of human history. . . . Lag phenomena are sufficient to account for this” (Schumpeter, 1950).

Due to this institutional inertia, Schumpeter argues, transitional states of society are the rule, and an “intact society”, i.e., a society in which the institutional and economic structure perfectly match, i.e., are consistent with each other, would be the exception (Schumpeter, 1948). However, there is no one-way causality between institutions and economic processes; the reverse is also true. The political process and democracy are cases in point as they are institutions mainly shaped by economic processes. To Schumpeter, politicians can be best conceptualized as “political entrepreneurs” that do not strive for the common good, but rather aim to govern the masses. Seen from this economic perspective, “the democratic method is that institutional arrangement for arriving at political decisions in which individuals acquire the power to decide by means of a competitive struggle for the people’s vote” (Schumpeter, 1942). I come back to this interesting part of Schumpeter’s vision when discussing the role of the state in the process of economic change. For now, I confine ourselves to Schumpeter’s general point: economic and institutional change interact and thus cannot be separated from each other.

Modern Schumpeterian Theory

The Schumpeterian vision has long inspired social scientists and their research. However, the rich and flowery prose in which Schumpeter used to write has not engendered an unambiguous interpretation of his ideas. This may explain why there are several schools of thought claiming to build upon his legacy. Schumpeter’s name pops up in such varied branches as neoclassical theory, evolutionary/institutional economics and political science. Below I concisely deal with the ways in which these disciplines make use of his body of work.

In spite of Schumpeter’s attack to neoclassical theory, mainstream economists have taken at least one aspect of his analysis seriously: the importance of innovation, both from a macro—and micro-economic perspective. Based on data of the US economy (1909–1949) Abramovitz (1956) and Solow (1957) demonstrated that standard macro-models could not explain a large part of economic growth. This “residual” Solow dubbed it, was attributed to technological progress, but it was still seen as an exogenous factor. Since the end of the ’80s, however, technological change was internalized in so-called “endogenous” or “new growth theory”.

Factors like “human capital”, “spillovers” associated with the public-good character of knowledge, and “increasing returns to scale” turned out to augment the explanatory power of growth models indeed. In turn, micro-economists were triggered by the importance that Schumpeter ascribed to the R&D-activities resulting from the “rise of big business”. Most of the time this view has been interpreted as if Schumpeter held an unqualified plea for the monopolistic firm. Galbraith (1967), for example, formulated the so-called “Schumpeterian thesis”, i.e., the proposition that large firms are more innovative than small firms. Ever since, neoclassical economists have been exploring the link between market structure and innovation.

Over the years a great deal of theoretical and empirical research has been done in this field (Kamien and Schwartz, 1982; Scherer, 1992; Van Cayseele, 1998).

The bulk of investigations focus on the relationship between absolute firm size or relative firm size (industry concentration) and innovative performance. The results are inconclusive, however. In a survey of studies on the Schumpeter thesis Scherer (1992) concludes with caution: "Most of that research supports a conclusion that Schumpeter overstated the advantages of large, monopolistic corporations as engines of technological change".

The evolutionary school in economics constitutes of a heterogeneous group of scholars all emphasizing the dynamics of economic life. Nelson and Winter (1982), well-known interpreters of this branch, explicitly claim to formalize Schumpeter's view that innovation-based competition is the driving force behind capitalist development. "We are evolutionary theorists for the sake of being Neo-Schumpeterians" (Nelson and Winter, 1982). One of the main features of evolutionary models is the use of a biological metaphor to grasp the economic process: just as organisms, firms in the market are regarded as being heterogeneous, boundedly rational and driven by routines (Fagerberg, 2003). The firms' chances for survival are determined by the working of selection (sorting) mechanisms in their environment—in the end, it is a process a "survival of the fittest".

Because of the routinized behavior of firms and their competitors, technological trajectories emerge that may follow a path in time that is not necessarily the most efficient one from an economic perspective. Due to increasing returns to scale (network effects) the path dependent character of technological development may lead to "lock-in effects", sometimes also referred to as "the economics of QWERTY" (David, 1985; Arthur, 1994).² The dynamic nature of innovation-based competition is also stressed in the vast literature on product/firm/industry life cycles and long waves. Vernon (1966), for instance, argues that a product typically passes through several stages of a life cycle: after its introduction an innovation enters a growth phase, but owing to increased imitation and excessive capacity a point of maturity is reached marking the product's decline. This cyclical pattern can be observed for firms and industries as well (Jovanovic and MacDonald, 1994; Audretsch and Feldman, 1996). Schumpeter's idea that revolutionary innovations may lead to a new wave of economic development has been taken up by evolutionary-oriented macro-economists such as Mensch (1979), Freeman et al. (1982) and Tylecote (1992). Based on the Schumpeterian vision, Mensch (1979) declares that important innovations emerge in bunches and do so especially in periods of depression. His argument is that firms tend to develop innovations when they are unable to get profit from existing activities. Moreover, if these innovations are interrelated in that they jointly give rise to pathbreaking "technological systems" (e.g., petrochemicals since the 1930s), a new long wave is put into motion, even in the context of the world economy (Freeman et al. 1982; Tylecote 1992).

The relationship between innovations and institutions Schumpeter pointed to has been elaborated in several directions. In particular from the 1990s onwards, business economists, innovation scientists and economic historians have developed concepts and frameworks to analyze the link between a country's institutions and its innovative performance. Business economists such as Porter (1990/1998) and Whittington (2001) are interested in the question of why some nations are able to produce innovative firms in certain branches of activity (e.g., the Dutch maritime industry), while other countries are not. According to Porter, there are four

explanatory factors: besides basic and advanced production factors, demand conditions, and the availability of related and supporting industries, he points to a determinant encompassing national institutional specificities, referred to as “firm strategy, structure and rivalry” (e.g., competition laws). Likewise, the literature on national innovation systems (Lundvall, 1992; Nelson, 1993) and technology systems (Carlsson, 1995; Edquist, 1997) argues that every country has its own innovation/technological system that reflects particular institutional elements. The idea is that the interaction in this system among various institutions (e.g., the organization of scientific research and the patent system) and innovating economic actors can act as a powerful engine of national economic progress.

Economic historians as well played a part in breathing new life into Schumpeter’s view. In “new economic history” institutions are labeled as stable structures reducing uncertainties and associated transaction costs in human interaction. In this respect, North (1990) focuses on the relationship between institutional change and technological progress in economic history. According to North, technological development is linked to the rate at which a society’s institutions are able to change (“adaptive efficiency”). He makes clear that in the past only a few countries had flexible institutions conducive for growth; most societies, however, got stuck in an institutional setting that hampered them from fully benefiting from techno-economic opportunities.

The last field in which Schumpeter’s vision has taken root is political science, particularly the theory of pluralist democracy and public choice. Schumpeter’s insistence on the analogies between political life and the economic process has been the starting point of the pluralistic approach towards democracy (Dahl, 1982). For pluralists the essential point of democracy is competition between political leaders (elites) for the people’s vote in a system with a pluralistic division of power among the elites. This view has been elaborated theoretically by Dahl in his influential theory on polyarchy (Dahl, 1971). For Dahl, elites make up winning coalitions by promising all kinds of advantages for diverse (interest) groups in society. By competing in this way, the elites hope to gain as many votes as possible to gain market share on the political market. Downs, one of the founding fathers of public choice, also recognizes the influence of Schumpeter: “Schumpeter’s profound analysis of democracy forms the inspiration and foundation for our whole thesis” (Downs, 1957). Indeed, public choice may be simply defined as “the application of economics to political science” (Mueller, 1979) along the lines Schumpeter originally had in mind. His insistence on methodological individualism and the role of political entrepreneurship in making collective choices has led to non-ideological theories about the utility-maximizing behavior of politicians, voters and bureaucrats (see e.g., Downs, 1957, Riker, 1962 and Niskanen, 1971).

An Appraisal of Schumpeterian Theory

Most appraisals of Schumpeter’s vision in the literature start with the remark that in the end he was wrong: today, capitalism seems to be more alive than ever (Heertje, 1981; Canter and Hanusch, 1999). Indeed, his expectation that the capitalist system would be self-destructive has been rejected by the course of history. Also, the recent reform processes in former socialist countries and the persistent

importance of small and medium sized enterprises in economic development suggest that Schumpeter was in error. In our view, the historical record is not a sufficient argument to reject Schumpeter's theory. After all, I repeat that Schumpeter himself noticed that "in these things, a century is a short run" (Schumpeter, 1942). Besides I think that the mechanisms underlying his main argumentation are still valid. As a matter of fact, capitalism has created a large class of highly educated people with critical minds.

Important reflections of this grow cadre of critics are discussions about the disappearance of the substance of property rights of shareholders in the corporate governance debate (Raaijmakers and McCahery, 2000), the "McDonaldization" of society (Ritzer, 1993), the ecological movement (Albrecht and Gobbin, 2001), and anti-globalism. To be sure, it is not very likely that these movements will cause the destruction of capitalism. They are indications, however, of what Schumpeter called the "crumbling walls" of the capitalist building. More important than sticking to the empirical validity of the Schumpeterian vision, I believe, is an appraisal of the concepts he introduced, for they are widely accepted now in neo-Schumpeterian approaches. In particular three of these typical Schumpeterian concepts can be criticized: entrepreneurship, innovation and evolution.

Firstly, it is not exactly clear what Schumpeter means by the "entrepreneur" and where this figure comes from. In his early work (1911) entrepreneurs are defined as heroic individuals; later on (1942), however, he seems to have changed his mind by denominating big business as the main innovator. I think that this duality in Schumpeter's work—that is usually referred to as Schumpeter Mark I and Mark II—should not be enlarged too much. Looking outside, he noticed that over the years entrepreneurship was losing importance in favor of big business, which may have confirmed him in his dynamic view on capitalism. This emphasis on change is also a valid argument why the neoclassical "Schumpeterian thesis" makes little sense in the Schumpeterian system. In the process of creative destruction there is no optimal structure, but instead continuous structural change: innovations destroy the existing market structure and replace it with a new one. Hence, the neoclassical search for the market structure most conducive for innovation in one moment of time is irrelevant. In our view, neoclassical economists are not really examining Schumpeter's vision but instead test a hypothesis they constructed themselves.

A more serious defect in Schumpeter's theory, however, is his lack of attention to the question of where innovating firms come from. The innovator enters the stage as a *deus ex machina*; it is an exogenous factor outside the economy. Reasoning the other way around, I only can say that the entrepreneurial function gradually will erode in societies showing an intellectual and policy climate that is hostile towards entrepreneurship. Thus, Schumpeter does not explicitly indicate what type of environment fosters the chance that entrepreneurial activities will emerge and what public authorities might do or refrain from to provide such a climate.

Secondly, Schumpeter's understanding of innovation is vulnerable. Innovations are loosely defined as "new combinations", varying from new goods, new production methods to new organizations. In Schumpeter's view, all of them have the same effect, namely that they are "the fundamental impulse that sets and keeps the capitalist engine in motion" (Schumpeter, 1942). This view does not take into account that the possibilities for innovation are not the same in every branch of eco-

conomic activity. In addition, Schumpeter's heterogeneous innovation concept leads to an undifferentiated idea of economic change. Hence, we do not know the direction in which the economic system moves. Which kind of economic activities will gain in relative importance in the course of time? And conversely: which branches and firms are likely to be the victims of the process of creative destruction? Owing to the importance Schumpeter attributes to the innovator at the supply side, his innovation theory may be characterized as "technology push". The long-run demand side of the economy, i.e., the customers and their changing tastes over time, do not play any role in the explanation of innovations. As argued in product life cycle analysis, for example, it is not because of the invention of a new commodity itself but the growth of the potential demand for it that an innovation succeeds, fails or loses importance (Schmookler, 1966; Vernon, 1969; Zweimüller, 2000).

Seen from this "demand-pull" perspective, long-term changes in the preference structure of consumers can stimulate or reduce the demand for innovations in a certain branch of activity. As structural change theorists—following Fourastié (1949)—see it, technological development and the associated imbalance between growing production and growing consumption will induce long-term structural change from an industrial towards a service economy (Knottenbauer, 2000). Whereas in the industrial era people still predominantly will demand an increasing number of goods and tend to value innovations of a material nature, the post-industrial period is showing an increasing concern with the quality of life and novelties in rather immaterial domains (e.g., health technology and wellness).

Finally, the loose use of the term "evolutionary" by Schumpeter to denote the capitalist process has caused confusion among his scientific successors. In general, evolutionary economists like Nelson and Winter are seen as the closest followers of Schumpeter.³ Indeed, these scholars do more justice to the dynamic conception of the economy than, say, Schumpeterian business economists and innovation scientists. Moreover, they have nuanced Schumpeter's view that besides radical innovations incremental innovations also play a role in industrial development. However, these economists have interpreted the term "evolutionary" in Schumpeter's work as an unqualified invitation to apply biological concepts, approaches and methodologies in studying economic change. Accordingly, evolutionary economic theory stresses the similarities between the economic and natural world; processes as variety, selection and survival are seen as decisive for the performance of both systems.

By contrast, Schumpeter was highly critical to the use of any biological analogy in grasping economic phenomena. At several places in his work, he argues that the economic system and biological system are fundamentally different, which make comparisons between the two largely irrelevant (Witt, 2002; Fagerberg, 2003). This makes the link between Schumpeter's vision and the evolution theory much weaker than is normally thought (Nelson and Winter, 1982; Hodgson, 1993). Of course, it can be questioned how important it is that scholars are really following in Schumpeter's footsteps. In the end, it is the validity of economic change theory that counts, irrespective of whether it builds on Schumpeter or not. At the same time, I think that Schumpeter's dynamic and institutional perception of economic change is too fruitful to neglect—particularly when we have a look at the policy implications of his view.

From Schumpeterian Theory to Policy

As we have seen above, Schumpeter's vision has been elaborated in several directions. Although his followers differ in interpreting Schumpeter, both his mainstream, evolutionary and business legacy draw similar conclusions when it comes to policy matters: innovation policy is seen as a legitimate way to contribute to the process of "creative destruction" and thus to an economy's development (see e.g., Scherer, 1992; Nelson and Winter, 1982; Porter, 1990). Not only scientists, but also policy makers use Schumpeter's insights as an argument to justify policy aimed at innovation (cf. OECD, 2000; Ministry of Economic Affairs 2003; European Commission, 2003). For example, the much-praised innovation policy in post-war Japan goes directly back to an interpretation of Schumpeter's body of work (Reinert, 1995). The decision by the Japanese government to invest in high-technology industries was entirely based on the advice from officials of the country's Ministry of Trade and Industry (MITI), who highlighted the writings of Schumpeter on innovation-based competition. Since then, Schumpeter is often cited in policy documents and forums defending temporary protection of domestic industries, innovation subsidies and other policy measures aimed at improving national "competitiveness".

Whether this concept, whose origin is also related to Schumpeter, makes sense for a nation—as opposed to a company—has been heavily debated (Krugman, 1996). Without going into this debate, the important point to grasp is that "competitiveness" is a relative concept, implying the need to compare with another. This is exactly what countries do at the moment in their attempts to raise their innovative capabilities: they benchmark themselves with other nations and transfer so-called "best practices" of innovation policy across time and place. The dissemination of these best practices is promoted, moreover, by international organizations such as the EU and the OECD, resulting in all kinds of score boards, case studies of successful "islands of innovation", and inter-country benchmarks.

In their concern for national competitiveness policy makers increasingly base their forms of innovation policy on inter-comparisons and thus what worked somewhere else. In practice, this trend of benchmarking has led to the set-up of regional policies with similar objectives, policy concepts, and instruments (Clark and Guy, 1997; Lagendijk and Cornford, 2000). All over the world countries claim to aim for "competitive advantage" by creating "framework conditions" for the formation of "high-tech clusters" and "innovation systems". Thus, the authorities hope to turn their area into a "hot spot" that rivals the economic success of "Silicon Valley". Among the exemplary areas authorities look for, this California high-tech hub has reached the status of one of the most successful "best practice" regions in the world. The area was the birthplace of the computer and its semiconductor cluster has been the leader in the development of many applications of modern information technology. All over Europe, officials have tried to create such "Silicon Somewheres" (Florida, 2002).

Some areas frankly admit that they want to become the next Silicon Valley, as they brand themselves as Silicon Forest (Seattle), Silicon Desert (Salt Lake City), Silicon Tundra (Ottawa), Silicon Glen (Scotland), Silicon Saxony (Eastern-Germany) and Silicon Polder (The Netherlands). Besides Silicon Valley popular Euro-

pean examples of “islands of innovation” are Baden-Württemberg in Germany (multimedia), the French city of Grenoble (nanotechnology) and the Scandinavian high-tech hub known as the Öresund (medical technology). Inspired by such “laboratories of modernity” governments at all scale levels (supranational, national, regional) tend to focus now on high-tech activities in their attempts to raise their economies’ competitiveness. In short, the copy-paste behavior among politicians in the field of innovation policy leads to attempts of areas across the world to turn themselves into the next “Silicon Somewhere”—without starting from and building on the national particularities of time and place.

From a Schumpeterian perspective, however, we may well explain the desire of so many places to create the next Silicon Somewhere. The clue for this copycat behavior is to be found in the analogies between the economic and political system (Schumpeter, 1942). As Schumpeter argued, politics is business: just like entrepreneurs, politicians take part in a competitive struggle—with votes as the tangible and profitable result. Likewise, political entrepreneurs search for ‘policy innovations’, i.e., successful policies meeting the interests of groups in society, with the ultimate aim to win the political game. Thus, businessmen trade in goods, politicians in votes. At this point, Schumpeter stopped his analogy. However, we could draw the parallel further and argue for the existence of swarms of innovative activity in the political sphere as well. In this line of reasoning, the trend of public authorities to copy “best practices” is a political variant of the tendency among economic actors to imitate innovations of successful entrepreneurs.

Applied in the particular case of innovation policy this means the following: the favorable climate created by the appearance of a “first mover” (say, Silicon Valley in California) evokes an upswing of reactions by other areas who are less creative and venturesome. By imitating the original “policy innovation”, they hope to share in the profits—and for some time they can. But as the pie has to be shared among more and more imitators, the chances to make profits from adopting the innovative success story erode. At some point, there will be an overcapacity of areas burdened with the same high-tech activity and a shake-out sets in, while politicians, hoping to turn the tide, search for new “best practices” (say, the Scandinavian Öresund in medical technology) to follow.

Schumpeter may well help us in explaining and criticizing the copy-cat behavior of policy makers but, in answering the obvious question of what policy, if any, is needed alternatively, his theory is less clear-cut. Sure enough, Schumpeter turns out to be reluctant to deal with the policy implications of his vision. “I recommend no policy and propose no plan. . . . But I do not admit that this convicts me of indifference to the social duty of science” (Schumpeter, 1939). His unwillingness to concern himself with policy advice is grounded in his belief that policy is always about politics. “In general declared policies are nothing but verbalizations of group interests and attitudes that assert themselves in the political game. . . . Nobody has attained political maturity who does not understand that policy is politics. Economists are particularly apt to overlook these truths” (Schumpeter, 1950).⁴

With Schumpeter’s reservations in mind, it is still possible to formulate a neo-Schumpeterian perspective on innovation policy. After all, the various remarks on policy in the writings of Schumpeter offer sufficient starting-points to “reconstruct” his view of the state (cf. Stolper, 1984; Starbatty, 1985; Gross and Weinstein, 1989).

I think that this policy-oriented legacy has been overlooked in the literature but is as relevant as Schumpeter's famous theory on innovation-based competition.

The Need for a Case-by-Case and Context-Based Approach

In the literature, Schumpeter's reluctance to derive policy implications from his vision regularly has been interpreted as an argument against state intervention and a plea for 'laissez faire', i.e., let the market do its work (see e.g., Swedberg, 1991b). But this interpretation does no justice to the nuanced policy view Schumpeter actually held. In fact, throughout his writings he attributes a role for the state in the economic process (Stolper, 1984; Gross and Weinstein, 1989). Contrary to most of his fellow-economists, however, he does not have normative ideas on the market and the state. Traditionally, the market is granted primacy by seeing the state as reacting to the market and not leading to market. In a Schumpeterian world the market is only one of the economic institutions and not necessarily the primary one. Even more important than the institutional embeddedness of the market is the dynamics that is taking place on it. In Schumpeter's dynamic view, the static notion of "market failure" simply does not make sense. The hustle and bustle of the economic process does not make possible to identify the ideal against which such failure should be benchmarked.

The relevant question instead, Schumpeter argues, is whether the economic system is sufficiently open for change so that the process of creative destruction can take place smoothly. After all, structural change manifested in the destruction of the old and creation of the new is compelling evidence for an efficient economy at work. It is in this dynamic setting that the function of the state should be seen. According to Schumpeter, public policy instruments can be of vital importance in mitigating the costs of progress; at the same time, however, policy constitutes the economy's most important danger because it may hinder the normal course of economic development.

But how much state intervention is allowed then? Schumpeter emphasizes that this is a matter of degree and will vary from case to case. A general principle is hard to give for "The ability to see things in their correct perspective may be, and often is, divorced from the ability to reason correctly and vice versa. That is why a man may be a very good theorist and yet talk absolute nonsense whenever confronted with the task of diagnosing a concrete historical pattern as a whole" (Schumpeter, 1942). The only general rule that counts for Schumpeter is this: any policy may be helpful unless it interferes with development, either through damaging the incentives that drive actors or through preserving resources that have become uneconomic. Over the years, Schumpeter has been consistent in this view. For example, in 1918 he defines the state's taxable capacity as 'anything that could be taxed without interfering with development' (Schumpeter, 1918), while, almost twenty-five years later, he blames anti-trust policy for interfering in the restrictive practices of large firms that "may be a condition for the level or speed of long-run performance" (Schumpeter, 1942).

Schumpeter does not, however, give us much help in determining what policies might be expected to produce results favoring economic development. Rather, he suggests which policy interventions are at odds with the economic system and thus

won't work. For one thing, Schumpeter does not believe in stabilization and redistribution policies: in an economy where instability implies progress, attempts of the state to stabilize the economy and redistribute the allocation of resources only will have paralyzing effects. For another thing, Schumpeter thinks general, macro-economic policies are of limited use. Such policies (e.g., Keynesian full-employment policy) rest on a superficial economic analysis; they do not take into account the differences on the meso-level (sectors/regions) that jointly make up the aggregate picture. Instead, remedies have to be tailor-made to address specific rather than generic needs.

For many economists, the Schumpeterian philosophy on state intervention will sound ambivalent. They probably will find it hard to understand how Schumpeter's aversion to the pursuit of most policies in the economic process (a market-friendly "laissez-faire" position) can go hand-in-hand with a view that policy measures should select particular subsets of the economy for special treatment (a highly interventionist approach). As a matter of fact, the dynamic Schumpeterian perspective does not fit well in the standard dichotomy "market/state" on which so much of the traditional literature on industrial, social, regional and innovation policy is based (see e.g., Burton, 1983, Esping-Andersen, 1990 as well as Armstrong and Taylor, 1997). The case Schumpeter makes is not *for* the market and *against* intervention in general; it is rather a case for intervention adapted to the particular circumstances of time and space.

Schumpeter points to the contextual set-up and takes into account the limitations under which government must make decisions and execute them. The overriding criterion for such a specific policy is whether its net effects aid rather than prevent the adjustment to structural change that is inherent in development. This can explain why Schumpeter defends at some places in his work the use of subsidies and protective measures to help domestic industries. In his view, for example, excess capacity in a country's steel industry is not an argument for deficit financing or financial support per se (Schumpeter, 1940). In this case, state aid is only acceptable and useful if the particular micro-economic conditions and contextual factors are such as to require the steel industry to adapt. But if the financial support enables the steel producers to continue their old strategies, production methods and habits, state aid is unacceptable and useless. Or, as Perroux (1988), a close follower of Schumpeter puts it: not any industry that has gotten into trouble should receive public support. What is needed, is a case-by-case and context-based approach: the decision to help industries in distress "must be made on the basis of what their anticipated complementary effects will be on existing industries" (Perroux 1988). In short, the dynamics of the Schumpeterian system always asks for a careful, targeted and context-specific choice of policy.

If anything, we may conclude that Schumpeter's followers' policy advice has not done full justice to their master. This is true for most of the mainstream, evolutionary and business literature as well as the policy makers making use of it. The Schumpeterian view on innovation policy is far more nuanced than the unqualified propagation of public measures aimed at supporting the process of "creative destruction". Rather, Schumpeter teaches us that only in the framework of the here-and-now it is possible to say whether the government can play a useful role or not. As we have seen above, this simple piece of wisdom is, curiously enough, often

forgotten. Slowly but surely it has become a tradition among policy-makers to chase after the latest trends. Most nations currently seem to be dazzled by a Silicon vision: most Western countries devote enormous sums of money to the development of information technology and do their best to follow the example of the alleged success of Silicon Valley by creating their own 'Silicon Somewheres'. Instead of merely copying such "best practices", policy-makers would do better to assume the existing economic and institutional structure of their own country and try to make the transition to the future *from* that specific context. Thus, if scientists and governments wish to take seriously Schumpeter's vision they will have to take their leave of the current tradition of chasing after trends. General policy implications and principles cannot be given; it is only in the particularities of time and space that the Schumpeterian view gets a meaning. Policy formulated along Schumpeterian lines is always tailor-made and by definition is a "unique practice". Thus, Schumpeterian innovation policy is not about copying what worked somewhere else. After all, Schumpeter would say, by relying on "best practices", countries will ultimately undermine their competitiveness.

Concluding Remarks

Joseph Schumpeter (1883–1950) is a good example of a deceased scientist whose ideas are still alive and kicking. He explains to us how innovative entrepreneurs and their followers set in motion a process of creative destruction that disrupts the equilibrium to which the capitalist system tends. Entrepreneurial innovation is not only about economics; it has institutional effects as well. Due to the rise of big business, discontented intellectuals and government intervention, Schumpeter contends, the very success of capitalism sets the stage for its long-run march into socialism. This Schumpeterian "vision" has inspired all sorts of scholars. In particular, neoclassical economists have elaborated upon the link between market structure and innovation and evolutionary and business-oriented authors have taken up the innovation-institution interface, while political scientists have built upon the analogies that Schumpeter sees between economic and political life. Although all these bodies of work are insightful, they still do not give in to the points of criticism on Schumpeter's work such as the loose use of concepts such as entrepreneurship and evolution as well as the neglect of the development of the economy's demand side over the long term. Moreover, Schumpeter's vision has not (yet) become true. Still, however, his theory increasingly reflects the temper of our times.

As I see it, this is certainly not the only reasons why it makes sense for innovation scientists to study Schumpeterian theory today. In the field of policy issues, the author has left behind a valuable but yet largely unknown legacy as well. Mostly, Schumpeterians and policy makers regard their master's view on innovation-based capitalism as an unqualified defense of innovation policy aimed at supporting the process of "creative destruction". This interpretation, however, is not Schumpeterian at all. Although Schumpeter himself was reluctant to deal with policy matters, his fragmentary notions on state intervention enable us to reconstruct a distinct Schumpeterian policy vision. In his dynamic view, the notions of market or system failure as an argument for innovation policy do not make sense. Rather, the relevant question is whether the economic system is kept sufficiently open for change

so that economic progress can take place easily. In securing this openness, the state can play a useful role—but only as long as the normal course of economic development is not damaged. Besides, if government decides to intervene, its remedies should not be undirected but tailor-made and context-specific, i.e., take into account the specific needs of a concrete case. We think that this piece of wisdom, so simple by yet so true, should be seen as an important Schumpeterian legacy as well—and not only in order to do justice to the Schumpeterian vision. This insight has practical relevance as well: it might temper the current belief among policy makers in “best practices” and prevent the wasteful efforts of many areas to become the next Silicon Somewhere.

Notes

1. “No country has embraced Schumpeter as the Japanese have”, Reinert (1995) notes. Indeed, after a long debate at the end of World War II the Japanese government decided to invest heavily in high-technology industries on the basis of the writings of Schumpeter on innovation-based competition.
2. David (1985) argues that individual decision making may result in the “lock-in” of a (technological) standard that due to increasing returns is successful though not collectively optimal. By way of illustration, he uses the example of the proved suboptimality of the arrangement of the top line of letters (“QWERTY”) on type boards.
3. For example, the professional journal of the International Joseph Alois Schumpeter Society is called the *Journal of Evolutionary Economics*.
4. Some relate the reluctance of Schumpeter to go into policy matters to his unsuccessful performance as an Austrian Minister of Finance ending with his resignation in 1919. From his diaries, he regarded this period of his life as unhappy and viewed these years with a mixture of shame and regret (Smithies, 1951; Swedberg, 1991a).

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