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M. Peneder

THREE SHORT NOTES ON SCHUMPETER: ENTREPRENEURSHIP, VENTURE FINANCE, AND COMPETITION

Schumpeter called upon economists to strive for mastering theory, history, and empirical methods. Accidentally, my three brief notes on the Schumpeterian agenda begin with a theoretical exercise, where I briefly comment on his notion of entrepreneurship, contrast it with alternative concepts, and try to fit them within a common modular approach. In what follows, I draw attention to the findings of a recent cooperation with an economic historian, where we study the intellectual and biographical linkages between Schumpeter and the rise of modern venture finance. Finally, I report about ongoing research on the empirical identification of the causal impact of competition on innovation (*inverted-U* hypothesis).

Keywords: *schumpeter, entrepreneurship, venture finance, innovation, competition.*

1. Introduction

Scientific theories are not meant to be engraved in stone. The more radical and round breaking new ideas are, the more they will be challenged and the more likely they will be overturned or amended. It is therefore the wealth of competing hypotheses, controversial arguments, and ongoing debate that signals intellectual success. It is in this sense, that I want to address the Schumpeterian agenda and illustrate its relevance together with the need to develop a contemporary perspective. I will not strive for comprehensiveness or draw a panoramic picture, but aim to do so by example of three short notes on topics to which I can relate with my own research.

2. Creative and adaptive entrepreneurs

Different from mere growth, Schumpeter (1911) characterizes development by the ongoing qualitative transformation that drives the expansion of an economic system. The creative force and prime mover of these changes is the entrepreneur, who fuels the process by own innovation. These innovations are not confined to technological change but must be understood very broadly, ranging from the

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Peneder Michael – Ph.D. in Economics, Austrian Institute of Economic Research (WIFO), Vienna, Austria, e-mail: mary@rmc.edu.ru.

introduction of new products or processes to the use of new resources, finding new markets, or changing the industrial organization (market structure). The distinctive feature is the creation of novelty, by which entrepreneurs upset the current configuration of competitive advantages in a given market. Inspired by his teachers from the early Austrian School, Schumpeter's definition of entrepreneurship was a radical break from the received theories of the other marginalist, the Marxian, or the classical traditions alike. They had pictured entrepreneurs as mere undertakers, or managers, if considered at all; and focused on capital and labour as the two central factors of production. In contrast, technological change was assumed to be exogenous and thus placed outside the economic system.

Entrepreneurship has since become a flourishing discipline. Despite the undeniable progress which has been achieved in recent decades, it has largely remained the "intriguing but elusive" concept that Baumol (1968) had poignantly characterized. Engaging scholars from diverse fields of economics, business strategy, and organisational behaviour, it still confronts us with a puzzling plethora of theoretical approaches and definitions (Davidsson et al., 2006). Compared to these, Schumpeter's concept excels by its clear definition and purpose. However, it also represents a rather narrow approach, which does not sufficiently capture the full phenomenon. Most important among alternative explanations are those by the later Austrian School, e.g. from Hayek (1945) to Kirzner (1979). Instead of innovation, they focus on the function of alert entrepreneurs to co-ordinate demand and supply by

the discovery and exploitation of exogenously given imbalances in prices. The second major alternative to Schumpeter's concept is the human capital theory of entrepreneurship by Theodore Schultz (1975). He emphasises the adoption and implementation of new technologies as the main characteristic of entrepreneurship.

All the three entrepreneurship theories share a disequilibrium view of the economy. However, their differences are also striking. While Schumpeter's entrepreneur is the source of disequilibrium, itself unsettling and transforming the system, the two other theories treat disequilibrium as exogenous, and characterise entrepreneurs by their adaptation to a constantly changing business environment and thus as an equilibrating force. The difference is most pronounced when we contrast Schumpeter with his focus on innovation, and Schultz, who stresses the exact opposite, i.e. imitation. Consequently, the three approaches are complementary, each pointing at different and important entrepreneurial functions that are invariably important for the working of the economic system. But in the contemporary literature, these analytic distinctions are largely lost, due to an unfortunate prevalence of synthetic definitions. Trying to capture a corner of each, they lose sight of the analytically important differences among them.

Table 1 presents an alternative modular concept of entrepreneurship, which starts from a generic definition and then distinguishes between its occupational,

behavioural, and functional dimensions. In short, the generic definition emphasizes the opportunity seeking nature of entrepreneurship, under which a large portion of the contemporary entrepreneurship literature can be summarized. It states in general terms, what is unique about that entrepreneurs do: the pursuit and exploitation of opportunities. To say that entrepreneurs pursue opportunities, implies intentionality, while the notion of exploitation brings in a criterion of success in the sense of an attempted realisation of venture ideas. Consistent with the fact, that many new ventures fail, it does not require sustained economic viability.

Table 1: The meaning of entrepreneurship

Generic definitions	
Entrepreneurship is the pursuit and exploitation of opportunities	
for	<ul style="list-style-type: none"> ... profit (<i>business</i> entrepreneurship) ... social change (<i>social</i> entrepreneurship) ... conservation of the natural environment (<i>ecological</i> entrepreneurship)
Occupational categories	
<i>Independent</i> entrepreneurs	Owner-managers running a businesses
<i>Corporate</i> entrepreneurs	Managers pursuing opportunities within the organisational context of a firm (Burgelman 1983a,b)
Selected behavioral characterisations	
(i) Cognitive leadership (Witt, 1998)	
(ii) Judgemental decision making (Knight, 1921; Casson, 1982)	
(iii) Creating new means, ends, or means-ends relationships (Venkataraman, 1997; Shane, 2004)	
Functional differentiation	
<i>Adaptive</i> (equilibrating)	<ul style="list-style-type: none"> (i) Market co-ordination (Hayek, 1945; Kirzner, 1997) (ii) Technology adoption / diffusion (Schultz, 1975)
<i>Creative</i> (disequilibrating)	(iii) Innovation (Schumpeter, 1911)

Source: Adapted from Peneder (2009).

The notion originates in economics and therefore the traditional focus is on *business* entrepreneurs, who pursue and exploit opportunities to make a pecuniary profit. But the modern literature increasingly expands the concept to other agents of change, e.g. in politics or the civil society, who pursue and exploit opportunities for social change (*social* entrepreneurs) or for environmental conservation (*ecological* entrepreneurs). However, for a theoretically meaningful transfer of the concept from economics to other areas, one must redefine the incentives in terms of individual, often non-pecuniary payoffs, and draft a proper institutional framework, which can complement or replace market rivalry as means of selection.

We further distinguish between two occupational categories that may both be the locus of entrepreneurial activity: First, independent entrepreneurs are opportunity-seeking in the sense of the general behavioural definition, but simultaneously perform the functions of riskbearing (ownership) and managing their own business. Alternatively, in firms with separate ownership and control the share-holders delegate the opportunity-seeking functions to its management. The locus of entrepreneurship is then with salaried employees, or corporate entrepreneurs. As the Schumpeterian motive of temporary monopoly profits does not directly apply to salaried personnel, other pecuniary motives must be in place to drive their entrepreneurial initiative, such as performance related pay, the external valuation on the job market, or the prospect for promotions.

Entrepreneurship research has also given rise to a number of different behavioral characterizations, which are in principle independent from the occupational status and can apply to independent owner managers just as well as to salaried managers. Among them, Table 1 lists the selected tasks of cognitive leadership, judgmental decisions, and the creation of new means, ends, or means-ends relationships.

Finally, for understanding how entrepreneurial behaviour contributes to the economic process, it is necessary to further distinguish at least three particular economic functions. As a disequilibrating force, entrepreneurship creates (i) new opportunities by means of innovation. As an equilibrating force, the alert discovery and exploitation of given opportunities (ii) improves market co-ordination through the detection and elimination of imbalances in the price/quantity relationships; and (iii) incites technology diffusion through the adoption of novel practices and techniques. Some firms simultaneously conduct all the three functions at a time, whereas some may specialise in exploiting opportunities of a particular kind, and others may experience the three modes at different times.

What is important to understand, is that each of the three functions of market coordination, technology diffusion, and innovation originate in the entrepreneurial pursuit and exploitation of opportunities. While the discovery of an opportunity is the appropriate characterization of the two former functions, the latter implies the creation of an opportunity. Since the notions of pursuit and exploitation of an opportunity encompass both, this general characterization identifies the only attribute that is both comprehensive and unique to the nature of entrepreneurship.

Another important point to keep from this discussion is that all the three functions of entrepreneurship are essential and complementary forces of economic development. The economic system needs creative entrepreneurs as much as it needs imitators who propel the diffusion of new technologies or those that help to co-ordinate demand and supply by means of processing the price signals from the market. Only if all of them are present, we can expect a varied and healthy ecology of organisations.

3. Venture finance

While Schumpeter is probably best known for his theory of entrepreneurship, venture finance occupied an enigmatic and much underrated place in both his intellectual and personal life. As a theorist, he placed a unique emphasis on entrepreneurial finance, which he considered to be the constitutive and foremost function of the money and capital markets. In his view, credit and interest are created by and feed on the phenomenon of innovation-driven development. When money was generally accepted to be a mere 'veil', affecting only the price level but without a lasting impact on real production, Schumpeter connected the monetary system to innovation, economic growth, and crises. He showed that beyond the mere facilitation of exchange, venture finance can enable and its lack obstruct different trajectories of development (Peneder, 2011; Peneder and Resch, forthcoming).

Schumpeter also pursued such profits actively during his brief and unfortunate history as a venture investor. After WWI, when still in Vienna, he invested on a grand scale in the foundation of new firms. Given the poor condition of industrial sites after years of war economy, the changed economic conditions due to the dissolution of the Habsburg Empire, and the excess demand for goods, the economic rationale appeared sound, but the financial scheme, timing and practical execution were not. In addition to spending his own wealth, he borrowed heavily from his privileged bank account, repaying short-term loans as the value of assets increased, and he raised considerable funds from third parties. Having built up large leverage, he was unable to refinance short-term loans when Austria was hit with its major banking crisis in 1924. As a consequence, the factories failed before they could produce a significant cash flow.

In many respects, Schumpeter's emphasis on the special relationship between entrepreneurship, finance and growth, carried him close to our understanding of the modern venture capital business. An interesting question is, why he didn't go any further and anticipate the rise in importance of equity relative to bank credit for the financing of innovation, or the emergence of risk capital in particular? The question arises, because at the very time, when he was a celebrated professor of economic theory at Harvard University, Cambridge and the Boston area became the birthplace of the modern venture capital industry. Even though there appears to be no record of a direct involvement, the coincidence of place and time is noteworthy, and one may speculate that Schumpeter must have exerted some kind of stimulus to this development.

For example, Schumpeter is known to have frequently researched the Baker Library at Harvard Business School, where Georges Doriot was teaching. Doriot is the founder of the American Research and Development Corporation (ARD), which is considered the world's first non-family owned venture capital company. In his biography, Ante (2008) portrays Doriot as a man with a clear affinity to

Schumpeterian thinking. Another biographical link to the emergence of venture finance is David Rockefeller, who studied under Schumpeter in 1936/37 and considered him “a delightful friend and one of the most inspiring and stimulating teachers.” He was a founding brother of the family’s venture capital investment branch which started in the 1930s and was led by his brother Laurence. Instead, David chose a career as ‘creative banker’ at Chase Manhattan, for which he repeatedly acknowledged Schumpeter’s influence.

Schumpeter was a creative venture investor already in the 1920s. But he failed, because of being overoptimistic, unexperienced, and struck by a banking crisis at the worst possible time. He also lacked the deeper theoretical understanding of contemporary corporate finance, especially with regard to agency problems and asymmetric information. Last but not least, he did not have the supportive institutional environment of the modern venture capital industry. By the 1930s and 40s, when institutional venture capital emerged within his close neighborhood, he had returned to his academic career and was simultaneously struggling with grand theoretical schemes and personal tragedies. After his own failed experiment, Schumpeter did not contribute directly to the emergence of venture capital. This was the achievement of more practical and business-minded people. But Schumpeter had an indirect impact on his intellectual environment, having identified the essential role of venture finance in economic development and provided it with a consistent and meaningful intellectual frame.

The upshot is, that Schumpeterian development thrives on the relationship between the creative entrepreneur on the side of production *and* the venture investor, who represents the selection and enabling function of finance. Both must cooperate for the creation of rents from innovation, but also compete for their later distribution. If we neglect Schumpeter’s venture theory of finance, the complex relationship of mutual dependence and conflict between the real economy and finance would be lost from his original vision.

4. Does competition foster or diminish innovation?

Is competition conducive or an impediment to innovation? Schumpeter (1911, 1942) already pointed at an uneasy, almost paradoxical relationship: the process of economic development is driven by the ongoing competition for monopoly profits from innovation. Thus, innovation feeds on rivalry for monopoly power, but if successful, it earns the monopoly rent by eliminating competition (Metcalfe, 1998). One may say, that if innovation is the motor of development, competition is its fuel.

But how can development be sustained, if the motor in full swing consumes all fuel? Schumpeter’s solution to the dilemma is twofold. First, he argues that innovation is logically inconsistent with a situation of perfect competition, where all firms are identical and new technologies is immediately available to all. Since the firm can earn no extra profit from innovation, there is no incentive to invest effort. Second, monopoly power from innovation is only temporary. In contestable

markets incumbents always face the threat of being displaced by entrants with a new technology, better business model, etc. ('creative destruction').

The two arguments have far reaching consequences. The first argument implies that more competition impedes innovation and the contemporary literature generally accrues this negative rent dissipation effect to Schumpeter. But the second argument implies that competition is needed to trigger a race for the next innovation. Here we have a positive effect. Competition raises the incentives to eliminate it by means of innovation. This escape competition effect is implicit in Schumpeter (1911), and made explicit in the formal model of Arrow (1962). It is therefore misleading to refer to Schumpeter and Arrow as antagonists, which is frequently the case in the contemporary literature. Especially so, if their work is reduced to the prediction of a negative Schumpeter and a positive Arrow effect of competition on innovation.

The modern surge of interest in the relationship between competition and innovation must be attributed to the work of Aghion et al. (2005). They extend the Schumpeterian growth model by distinguishing between the firms' pre- and post-innovation rents and relating them to the relative proximity of firms to the technological frontier. The rent dissipation effect relates to a negative impact of competition on post-innovation rents, which implies that competition is expected to be high even if the firm successfully innovates. In contrast, a positive escape competition effect will dominate, if the innovation can give the firm a competitive edge over its rivals. More precisely, it occurs if competition reduces preinnovation rents more strongly than post-innovation rents, thereby raising the incremental returns to innovation and hence the incentives to invest in innovation activities. The key prediction of Aghion et al. (2005) is that the positive escape effect of competition on innovation dominates at low levels of initial competition, while the negative dissipation effect dominates at high levels of competition. The precise trade-off depends on the technological characteristics of an industry, but the resulting inverted-U relationship nicely combines the interaction of the two distinct effects of competition on innovation.

A similar U-shaped relationship was presented earlier by Kamien and Schwartz (1976). They modeled an innovation race, where firms seek the development period which maximizes the expected present value of an innovation. The firm faces a trade-off: a longer development period reduces the cost of innovation but also the according stream of revenues. Maximizing the expected net return of innovation effort, more intense rivalry increases the risk of preemption and hence incites more R&D for low to intermediate ranges of that hazard. However, when the risk of rival preemption becomes sufficiently large, firms start to reduce their effort. The inverted-U relationship results from the fact that increasing competition raises the risk of preemption by rivals, but also the cost to defend against it. To give an example of recent empirical research, Peneder and

Woerter (2014) test the predictions from the Kamien and Schwartz model for a pooled sample of Swiss firms. To take account of the strong endogeneity in the relationship between innovation and competition, they estimate a simultaneous system of three equations. First, the innovation opportunity function tests the inverted-U relationship between the number of competitors firms report, and their innovation activity. Second, the innovation production function controls for the relationship between innovation effort and outcome. Referring to the modular concept discussed in Section 2, the latter is measured by different categories of creative and adaptive entrepreneurship. The final innovation impact function provides the estimates of how this entrepreneurial status affects the number of competitors.

In short, the findings confirm a robust inverted-U relationship, where a higher number of competitors increases the firm's innovation effort, but at a diminishing rate. Technology potential, demand growth, firm size, and exports are also shown to have a positive effect on innovation. Splitting the sample by firm types, the inverted-U shape is steeper for creative than adaptive entrepreneurs. This implies that for the former group innovation effort is more sensitive to changes in competition than for the latter.

The analysis reveals three potential stable equilibria. In the first equilibrium, monopoly is legally protected and hence not contestable. Innovation will be low or non existan. In contrast, the second equilibrium is characterized by low competition and high innovation. Moving from monopoly to some degree of (still low) competition increases innovation, which is consistent with the way Arrow (1962) framed his case for a positive effect of competition on innovation. If competition further increases and passes a certain threshold, the system is geared towards the third equilibrium of no innovation and very high competition ('no innovation trap'). Comparing the second with the third equilibrium, the estimates are consistent with Schumpeter's negative impact of competition on innovation, and in particular the impossibility of innovation within a market of perfect competition.

Friesenbichler and Peneder (2015) test the validity of the same simultaneous model for a large sample of firms from Central Eastern Europe (CEE) as well as Central Asia and Caucasus (CAC), covering the year 2012 for Russia and 2013 for the other countries. The data are taken from the Business Environment and Enterprise Performance Survey (BEEPS), which is jointly financed by the World Bank and the European Bank for Reconstruction and Development.

The estimations for these transition and developing countries confirm the inverted-U shaped effect of competition on research effort. This means that at low levels of initial competition, an increase in the number of competitors incites firms to do more research, but at a diminishing rate. The largest incentives for own research activities are found at intermediate levels of competition and then begin to

decrease, when the intensity of competition further grows. In a second set of estimations, the system is extended by a fourth productivity equation. While the properties of the initial endogenous system remain unchanged, both competition and innovation are shown to have a positive impact on productivity.

5. Concluding remarks

What should be the appropriate agenda of a 'Schumpeterian Economics' in the 21st century? One can make a convincing case that Schumpeter provided the most comprehensive vision of the driving forces of economic development, emphasizing the complex interplay, for instance, between entrepreneurs and investors, characterized by mutual dependence and conflict; between competition and innovation, where causal impacts can go either way, depending on the initial situation; or more generally between micro-behaviour and macro phenomena, such as growing per capita incomes, fluctuations and business cycles, or even crises.

However, Schumpeter's most influential publication is more than 100 years old. If his agenda is enduring and fertile, one must find progress in research on many of the constitutive elements of his theory, no matter whether these come with explicit reference to him, or not; and no matter whether these confirm, reject, or amend his findings. They should add new perspectives and detail to our knowledge, or raise novel questions and ambiguities. In short, Schumpeter's theory still provides a strong backbone and a surprisingly enduring common thread for contemporary research. But to keep the agenda alive, we must continuously challenge his work.

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М. Пенедер

**ТРИ КОРОТКИЕ ЗАМЕТКИ О ШУМПЕТЕРЕ:
ПРЕДПРИНИМАТЕЛЬСТВО, ВЕНЧУРНЫЕ ФИНАНСЫ
И КОНКУРЕНЦИЯ**

Й. Шумпетер призывал экономистов стремиться к освоению теории, истории и эмпирических методов. Непредумышленно, мои три короткие заметки в свете учения Й. Шумпетера начинаются с теоретического упражнения, где я кратко комментирую его понятие предпринимательства, сопоставляя его с альтернативными концепциями, и делаю попытки вместить их в рамки общего модульного подхода. Далее, я обращаю внимание на результаты недавнего сотрудничества с историками экономики, где изучались интеллектуальные и биографические связи между Й. Шумпетером и современными венчурными финансами. И, наконец, я сообщаю о текущих эмпирических исследованиях по идентификации причин, влияющих на конкуренции в инновациях (инвертированная – U гипотеза).

Ключевые слова: *Й. Шумпетер, предпринимательство, венчурные финансы, инновации, конкуренция.*

Пенедер Майкл – доктор экономики, Австрийский институт экономических исследований, Вена, Австрия, e-mail: mary@rnc.edu.ru.