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A Comprehensive Neo-Schumpeterian Perspective on Today's Economic Problems

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The last years were marked by a sharp and severe crisis on the financial markets which spread in a very painful way to the real sector of the world's economy and lead to many problems even beyond the scope of pure economics. Furthermore, we face dangerous developments in fields like climate change, aging societies and energy security where we need sustainable solutions for the future. This calls for innovations which are the major driver of economic growth and development. To analyze innovation processes the restriction of a framework suited to the analysis of innovation towards the industrial sphere of an economy is not sufficient because of the important co-evolutionary dimensions of innovation. Instead, a comprehensive economic theoretical approach is needed which encompasses all spheres of economic life. This paper is filling this gap by introducing Comprehensive Neo-Schumpeterian Economics and the Neo-Schumpeterian approach towards public sector economics.

1 Introduction

It is a remarkable and different time these days. It appears to be so special and unique, only comparable to the period at the end of the Twenties and the beginning of the Thirties of the last century. Back then, however, there existed more or less only one real problem for society and politics, namely the economic crisis which began to spread in a dramatic way to become a worldwide crisis of nations and cultures.

Today, we also have to consider other developments which will significantly influence and limit our lives and our future besides the consequences of the economic crisis. The climate change and the ecological effects which will apparently derive from it for us and the next generations are an enormous source of danger opening up in a parallel way to the economic crisis (see for example IPCC 2007). Questions concerning the exploitation and the use of energy and the sustainable management of our natural resources shape another field of concern of growing significance for the existence and the form of our life on this planet Earth (see for example Baumann 2008). The same is true for the threatening developments stemming from an aging population in societies in highly developed economies which we cannot afford to lose sight of in times when almost all crisis comments focus on the financial and economic sector (see for example Cutler et al. 1990).

However, it cannot be our ambition here to address all of these unpleasant developments from a Neo-Schumpeterian perspective. We will limit ourselves to the discussion of the present global economic crisis. Only one short comment should be allowed:

This crisis does not only carry risks and dangers with it, it also offers the great opportunity to link economic policy to other goals such as a sustainable climate and environmental policy. The slogan should be to make economic policy not at the expense of climate and environmental concerns, but to understand economic policy also as a kind of climate policy. The next wave of innovation in the world may very likely be based on climate aware and resource protecting technologies.

In this paper, we will link today's economic challenges to a framework called Comprehensive Neo-Schumpeterian Economics which is in our view better suited to give satisfying and feasible answers to the most pressing questions we are facing today.

2 A New Research Programme in Economics: Comprehensive Neo-Schumpeterian Economics

Since the 1980s questions of economic growth and economic development experienced a Renaissance in economics after almost 25 years of silence. Seemingly unsolvable problems to overcome decreasing rates of marginal capital productivity and the methodological problems of an aggregate production function (e.g. Sraffa 1976) left economic growth theory after Solow's promising start in the 1950s (Solow 1956) out of the game. In this discussion, the major drivers of quantitative growth as well as – as some protagonists of Neo-Schumpeterian economics claim – of qualitative growth (e.g. Saviotti 1996) are technological, organisational and institutional innovations. Economists widely agree on this.

Despite this general agreement on the important role of innovations two different schools of thought developed in economics:

(i) Neoclassical growth theory experienced a proper rejuvenation with the so-called New Growth Theory (among others Romer 1987, Lucas 1988). New Growth theoretical approaches allow to get rid of the major problems of decreasing marginal capital productivity and convergence of growth rates by considering positive feedback effects (e.g. so-called technological spillovers or the explicit consideration of human capital) emerging in innovation processes. Although theoretical inconsistencies cannot be denied - in particular the concept of positively interpreted spillovers on a macro-economic level cannot be complemented on a micro-economic level where technological spillovers are generally negatively interpreted (see Pyka, Gilbert and Ahrweiler 2009) - new growth theory is considered to fit well into the theoretical framework of neoclassical theory which supported considerably its diffusion.

(ii) The alternative approach is Neo-Schumpeterian Economics, which started almost at the same time, but has chosen a radically different conception not following the principal goal of being able to integrate into the body of theory of neoclassical economics (e.g. Nelson and Winter 1982). Referring to the Theory of Economic Development by Joseph A. Schumpeter (1912), the contradictoriness of economic development driven by innovation with concepts like Olympic rationality and economic equilibria is emphasized. Economic growth driven by innovation is compulsorily accompanied by structural change endogenously caused by the purposeful and sometimes erroneous actions and interactions of economic agents, i.e. knowledge generation and diffusion processes. Increasing efficiency on a sectoral level (i.e. process innovation) raises resources which are used for the explorative purposes (i.e. product innovation) which might lead to the emergence of new industries supporting long run economic growth by simultaneously triggering qualitative development (Saviotti and Pyka 2004). The dynamics are to be observed on a microeconomic level (entrepreneurship) and manifest themselves on the sectoral level (industry life cycles). What is measured, however, on the macro-economic level as economic growth is only the average from structural dynamics on the meso-level of an economy and very likely does not tell anything about the true causes of development.

Today, Neo-Schumpeterian Economics has become an independent and also widely recognized research programme (e.g. Dosi et al. 1988, Fagerberg, Mowery and Nelson 2005, Dopfer 2005 and Hanusch and Pyka 2007a) which influences considerably the design of innovation and technology policy in particular by international organisations such as the OECD (OECD 1991), the World Bank (World Bank 1999) and the European Commission. At the latest since the mid of the 1990s, technology and innovation policy cannot be analyzed without Neo-Schumpeterian concepts such as technological clusters (e.g. Braunerhjelm and

Feldman 2007), innovation networks (e.g. Pyka 2002) and entrepreneurship (e.g. Grebel, Pyka and Hanusch 2003).

Until most recently, however, the innovation-orientation of the Neo-Schumpeterian approach is applied almost exclusively to manufacturing and service industries. In Hanusch and Pyka (2007b), we show that the innovation-orientation in the industrial sector is only one prerequisite for economic growth and development. The growth success of an economy similarly depends at least on the innovation-orientation or respectively future-orientation of financial markets as well as the public sector. Economic growth and development are carried forward by these three pillars of economic systems which are encompassed by the bracket of true uncertainty (Knight 1921) which is inseparably connected to all kinds of innovative development processes. This intrinsic uncertainty of innovation processes is the major cause why mainstream economic approaches cannot be used either for analyzing industries or financial markets or for counselling the activities of the public sector when it comes to innovation. The concept of rationality applied in neoclassical economics is not applicable in uncertain situations. The Olympic rationality of neoclassical economics leads to a pathological pessimism concerning any kind of innovation. Without a general willingness to innovate, i.e. a willingness to deal with the ex-ante non predictable possibility of failure and economic losses, any innovative behaviour becomes impossible.

From this, one can easily see that for an economic analysis of the potentials for growth and development of economies one cannot apply the idea of innovation to industrial sectors only. The innovation orientation has to be transferred to the financial markets and the public sector, as well as to the important mutual influences between these three realms of economic development. By this transfer of the innovation- respectively future-orientation and the accompanying uncertainty we develop Comprehensive Neo-Schumpeterian Economics (CNSE) (Hanusch and Pyka 2007c). Only in CNSE, concepts used in the theory of financial markets like venture capital or in theory of public choice like political entrepreneurship receive their original innovative meaning.

The purpose of this paper is to summarize our work (Hanusch and Pyka 2007a, b, c, d, Hanusch, Pyka and Wackermann 2009) on the future orientation of the public sector in the CNSE approach. For this purpose we outline in section 2 a Neo-Schumpeterian theory of the state. In section 3 we focus on the requirement to consider the co-evolutionary dimensions of all economic domains. Section 4 finally applies empirically our theory to the public sectors of the European Union and their dynamics. Section 5 concludes.

3 The Public Sector in CNSE

Our considerations of a Neo-Schumpeterian theory of the public sector focus on the justification of the state and encompass a normative perspective in the sense of defining tasks for public activities as well as a positive-empirical perspective supposed to explain real developments.

- Justification of a public sector

The existence and necessity of a public sector can be explained within the Neo-Schumpeterian approach by the persistence and inevitability of uncertainty accompanying every kind of innovation. Schumpeter's notion of creative destruction in his 1942 book Capitalism, Socialism and Democracy hints at the two sides of the innovation coin: in every innovation process, we find winners and losers. Ex-ante it is impossible to know who will win and who will lose the innovation game. Accordingly, the uncertainty of innovation processes throws a veil of ignorance over the economic actors. In this sense, the ideas of John Rawls' Theory of Justice (1971) can be transferred to the Neo-Schumpeterian context. An individual as a member of society can agree on a social contract to deal with the peculiarities and imponderables of innovation processes. This social contract then has to be executed by a state authority. In the Neo-Schumpeterian context, sure enough the social contract also applies to firm actors and entails both support for uncertain innovation activities and social responsibilities in the case of innovative success (e.g. Acs 2006).

- The normative view on the public sector

In the CNSE perspective, the process dimension of innovation outweighs the artefact dimension prevailing in neoclassical economics. Innovation is considered to be the general strategy to deal with and to overcome problems in all spheres of economic life. Whereas in neoclassical economics innovation is considered to be the exogenous setting of new restrictions, in a CNSE perspective innovation is the proactive and therefore endogenous displacement and movement of restrictions. Accordingly, welfare – as the final goal for all kinds of policy initiatives – is no longer a static concept but also related to the processes of innovation. In other words, welfare strictly corresponds with the risk appetite and the appetite for experimentation in a society which are the prerequisites to develop the capabilities to design and to create a desired future.
This normative perspective of an economic theory of the state is supposed to guide the deviation and design of all public activities - encompassing public expenditures as well as public revenues - which in a Neo-Schumpeterian context has to include the developmental

potential of the economy. In this sense, basically all public interventions have to be scrutinized, as to whether they support or hinder the potential of economic development. Accordingly, for public activities, an orientation towards the future is postulated which is directly attached to the capabilities to design a desired future.

Two types of failure generally endanger this goal and can be considered the cardinal errors of economies: the first deals with the danger of discarding promising opportunities too early, whereas the second deals with the possibility of staying for too long on exhausted trajectories (Eliasson 2000). In both cases, resources for future development are wasted, which demands for policy intervention.

But why do economies and economic actors tend to fall for these failures? The sources of potential failures are manifold, but again stem from the uncertainty underlying economic processes as well as the complex nature of novelties:

A first example is given by consumers' decisions concerning so-called merit goods as introduced by Richard Musgrave (1958) in public finance. Due to the future orientation and the complex character as well as the high probability of positive spillover effects of merit goods, individuals tend to strongly undervalue their consumption as, e.g. in education, or to underinvest in respective activities, as e.g. with respect to R&D. A future-oriented policy, therefore, has to consider these shortfalls, e.g. by improving the knowledge of economic actors concerning the benefits of the respective goods and activities and/or by supporting their consumption, use and production.

A second example deals with different and unbalanced speeds of development, which is symptomatic of dynamic innovation-driven processes. Creative destruction in a Schumpeterian sense is most often closely connected to the obsolescence of labour qualifications which might cause severe problems of mismatch unemployment on the labour markets – the new qualifications are not sufficiently available, whereas obsolete qualifications abound. From the perspective of Neo-Schumpeterian economics this mismatch on labour markets demands not only an administrative design of labour policy, but also an active future-oriented design.

To complicate matters further, economic and social policies are not independent but are highly interdependent and affect one another. Not all policy packages are stable or beneficial. This is tantamount to saying that policies and the economy or society on which they are applied are components of one system. Changing one policy can in principle affect the whole system and the outcome of any policy change may not coincide with the one expected ex-ante. In particular, there can be coherent, or virtuous, and incoherent, or vicious, policy packages. For example, an economic system which faces a massive obsolescence of

competencies due to innovation accompanied by an increasing international labour division and which has

- unemployment caused by an imbalance between competencies supplied and demanded
- very high barriers to laying-off people
- no or inadequate training programmes aimed at changing the competencies of the labour force, and
- a system of unemployment benefits in which benefits are paid without attempting to induce people to be retrained in order to change occupation,

has from a Neo-Schumpeterian perspective an incoherent policy package. Unemployment is mostly created by inadequate competencies and the fact that people on unemployment benefits are paid to stay out of the labour market, thus further degrading their competencies. This combination creates a vicious circle in which people becoming unemployed can never re-enter the labour market and their number is likely to increase if the misalignment of supplied and demanded competencies persists. However, modifying only labour market policies is very likely not to be sufficient in this situation, but additional measures affecting education, conditions for entrepreneurship etc. might be necessary. It is at the heart of Comprehensive Neo-Schumpeterian Economics that isolated modifications of one subsystem might cause not the desired effect, but causes, via feedback loops, detrimental effects in other subsystems.

With respect to recent labour market policy designs, the Danish model implemented since the 1990s is a good example of a future-oriented approach in a Neo-Schumpeterian fashion which avoids the above outlined vicious circle by introducing a proactive dimension into labour market policies (see e.g. Lorenz and Lundvall 2006). On the contrary, German labour market policies aiming at the re-establishment of private demand very likely is responsible for a deepening of structural mismatch unemployment.

- The positive-empirical view on the public sector

With respect to a positive-empirical approach of a Neo-Schumpeterian theory of the state, which seeks to explain real developments, a promising starting point again comes from public finance and an empirical observation discussed more than 100 years under the heading of Wagner's Law (Wagner 1892). Adolph Wagner (1835-1917) formulated this law following empirical observations that the development of an industrialized economy is accompanied by an increasing absolute and relative share of public expenditures in GNP. According to Wagner, the reasons for the income elasticity above unity towards public goods are to be seen

in the increasing importance of law and power issues as well as culture and welfare issues in industrializing and developing economies. This way, public dynamics are narrowly connected to Neo-Schumpeterian dynamics, which demand higher qualities of public goods such as infrastructure, education, basic research etc. as a condition sine-qua-non for economic development.

To avoid either an unbounded growth of public activities, which Schumpeter (1950) himself labelled the march into socialism, or an increasing privatization of public goods e.g. in the health and education sector - which goes hand in hand with an increasing uneven distribution of services - itself an obstacle for economic development - a policy recommendation of Neo-Schumpeterian economics has to focus on adding a qualitative dimension to Wagner's quantitative dimension. This can be achieved only by taking seriously the normative requirement in the design of all public activities of the Neo-Schumpeterian approach, namely their orientation towards future development. In the case of potentially insane Wagnerian dynamics leading to an overall expansion of the public sector, a Neo-Schumpeterian policy design will have to encompass a strengthening of the absorptive capacities of consumers towards superior merit goods.

4 The co-evolutionary dimension

Conceptually the co-evolutionary dimension is by far not new to economics and usually leads to a set of assumptions which are considered to frame economic processes and decision making. In pure economic theory, however, the co-evolutionary nature is more or less neglected by referring to the so-called ceteris-paribus assumption. We claim that in order to investigate the relationship between the public sector and economic development this assumption is not applicable. Instead in addition to interfaces also the intersections between the public and private sectors have to be considered in order to capture interdependencies and co-evolutionary potentials.

A brief historical example describing the co-evolution of innovation policy and economic development may help to illustrate this point. This example furthermore sheds some light on the development from a manufacturing-based economy towards a knowledge-based economy which has triggered several changes in the role of the public sector as well as of the public-private interactions. Until the 1970's the most important task of the public sector with respect to the future-orientation of an economy was seen in the financing and coordination of the basic research sector as well as the institutional design of intellectual property rights to provide incentives for private actors of being engaged in R&D. Since these days crucial changes have taken place.

An increasing international competitive pressure (e.g. the raise of the Japanese economy and their successes in car manufacturing and consumer electronics) introduced a new field of activity for the public sector, namely technology transfer. The large successes of the basic research (and military research) system (e.g. US-American Apollo programme among others) should be transferred more quickly and effectively to the industrial application domain. New in the design of respective measures was the cooperative and pro-active approach between public and private agents which complements the framework setting role of the public sector with its today prevailing governance role.

In the 1980s large structural transformations in the industrial sectors were triggered by the advent of new general purpose technologies (see Lipsey et al. 2005) like information and communication technologies and biotechnologies. Besides the large national monopolies in telecommunication and the large pharmaceutical companies, small technology-oriented companies appeared which started to play a decisive role for knowledge generation and diffusion processes in economies. (Very similar developments can be observed in the energy sector in the first decade of the 21st century with small companies being engaged in renewables challenging the business models of traditional huge energy firms.) Those economies which were able to provide a prolific environment for entrepreneurship (e.g. institutional settings focussing on low entry barriers, provision of public credits, flexible rules dealing with spin-offs from universities etc.) were able to create decisive advantages for their relative position in global economic development within one decade. They managed to get into worldwide leading positions in these new technologies. For those economies who were not among the first countries which introduced these new industries it turned out later to be extremely expensive to catch up (e.g. biotechnology in Germany) or even impossible to do so (e.g. ICT in Germany).

The cooperative dimension of the public sector is strengthened in this period. With respect to the ICT industries this can be seen in the importance of national (sometimes even international) institutions of standardization. Even more visible is this cooperative dimension in the modern organization of research and development in pharmaceutical biotechnology: Public research laboratories and universities as well as private actors such as dedicated biotechnology companies as well as large diversified firms are connected in innovation networks where knowledge is generated and diffused by interactive development processes. In many economies, the cooperation dimension between the public and private sphere also includes financial relationships when public policy programmes were designed to fill the gap of missing venture capital for a certain new technology.

From this brief example one can see that intersections of the public sector comprise the (i) industrial-public intersection as well as the (ii) public-financial intersection.

(i) The industrial-public intersection has an important manifestation in the design of modern innovation organization which in the literature is labelled as collective innovation processes (e.g. Pyka 1999). Private firms and public research institutes collaborate in knowledge creation and diffusion which includes, besides inter-institutional collaborations between firms and public research institutes, the engagement of private firms in basic research e.g. among others in areas as molecular biology and nanotechnologies, as well as pro-active technology transfer in public-private research partnerships.
Or consider the international and interregional competition for industrial settlement, its impact on future development of nations and regions, and the role the design of tax systems plays in this competition. A future oriented Neo-Schumpeterian policy has to scrutinize whether the conditions generated by public activities allow for, or even open up, developmental potentials for the industrial sectors in the future.
(ii) The public-financial intersection comprises policy activities to attract financial actors i.e. their international location decisions, and to provide for knowledge and information in highly uncertain areas of innovation and industry development in order to support the decision making processes of financial actors. It also includes the cooperation of financial actors when it comes to the implementation and application of policy programmes to support innovation and entrepreneurship. In particular, a long-term commitment based on sound technological forecasts is postulated to be an essential ingredient of a future orientation in financial markets, which, however, demands for joint efforts of and fine-tuned coordination between the public and financial sectors.
The above examples can show how many different interrelationships and intersections exist between the public sector and other economic domains and how relevant they are for a future-oriented concept of economic development.

- The Concept of a Neo-Schumpeterian Corridor

As we already saw, CNSE focusing on innovation driven, future-oriented development has to offer theoretical concepts to analyze the various issues of industry, financial markets, and the public sector and their encompassing qualitative interrelations. Innovation and, as a consequence thereof, uncertainty are ubiquitous phenomena characteristic of each economic domain and also of their intrinsically interwoven connectiveness. An improved understanding of the development processes going on in modern capitalistic economies can only be expected when these co-evolutionary dimensions are taken into account. This is illustrated with the concept of a Neo-Schumpeterian Corridor shown in figure 1 (cf. Hanusch and Pyka 2007c and Hanusch and Wackermann 2009). The Neo-Schumpeterian Corridor is purely illustrative. The

origin of the coordinate system represents the present stage. The corridor is widening in time because of the uncertainty shaping future development. Within this corridor, economic entities, companies as well as economies, can move freely and can choose a success-based and promising position dependent on their specific preconditions. In this sense, the corridor also serves as an outline for possible developments that political actors have to respect as well.

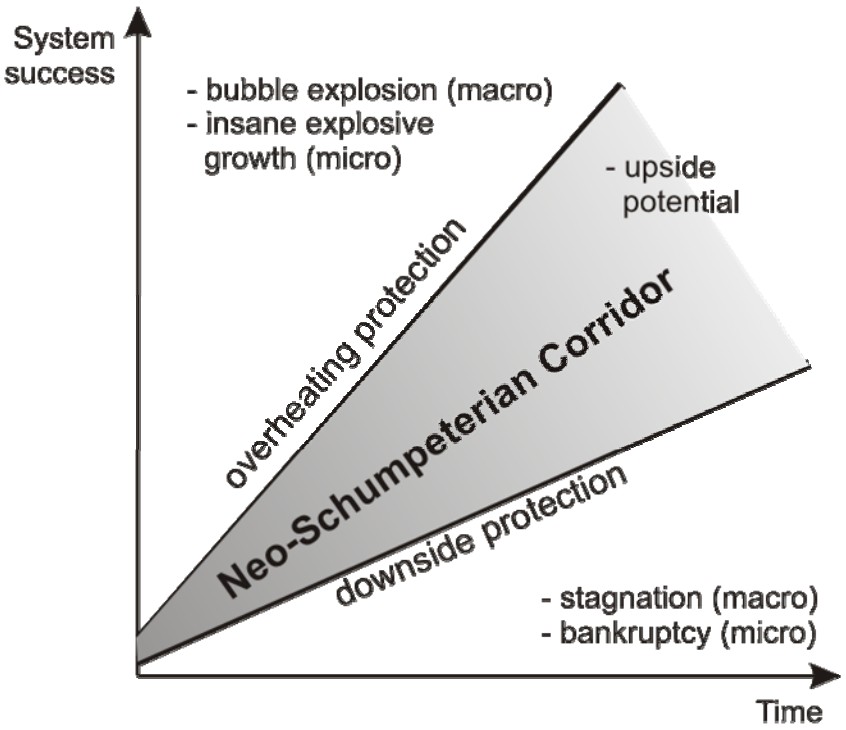


Figure 1: The Neo-Schumpeterian Corridor

Without doubt, the essential asset of this concept is its future oriented focus. It is of utmost importance for the long-term stability of the economic system that its progress is neither too large nor too small. Too little growth cannot establish an advancing dynamics, and the standard of living in an economic area would have to suffer. The increase in investments would be insufficient both in the private and the public sector as well as with respect to physical, human, intellectual and social capital. The people will then adopt a negative view on the future development and, therefore, oppose and block the creative access to innovations and risk propensity. These two elements, however, sum up the driving forces of development in a capitalistic economy. At the end of a period of insufficient growth, the living conditions will inevitably decline on a relative basis. The relative recession may even be aggravated, if other regions, nations or economies achieve a higher growth and standard of living.

The same is true for the case of an economy that is too successful and attains growth rates far above average, rates which may be neither sustained nor stabilized. This success may very well create the positive and optimistic basic attitude in the economic agents necessary for future-oriented operations. But, rapid growth is also always linked to an accelerated process of change in the structures of an economy. There are sectors which are readily expanding and others that do not grow as dynamically and so cannot keep up with the fast pace of development pushed upon them by the fast growing domains. The real development in such an economic system will then be determined by two velocities. The forces that impose and can bear the high speed will be found in the innovative and strongly growing sectors and companies, while the sluggish variables fall into the sectors of low growth. As long as the latter serve as a natural brake for exuberant economic dynamics, the economy will continue to position itself within the corridor and quite possibly even at its upper boundary. From a theoretical point of view, this is the best and economically the most successful situation for an economy (cf. Saviotti and Pyka 2008). Admittedly, this case will empirically only occur in the rarest cases for a longer period of time.

For the structural conflict between the fast and the slowly developing industries in an economy can – even if it was limited to the real sector and therefore seems to follow the Schumpeterian ideal of "creative destruction" – lead to the complete breakdown of the entire system, because the inert sectors can no longer support the high pace of growth of the dynamic industries. This may happen when, for example, the infrastructure, the training of employees or the adaptation to customers' wants or suppliers' conditions cannot be altered and harmonized rapidly enough and will then work as a scotch block for all sectors (see for example Wong 1999).

Still, this case may also be seen as an exception, just as the "natural" adjustment of dynamic and retarding forces in an economy or an economic region. Empirical findings and the history of economics show that, in general, two spheres of action are responsible for the determination of the state and the position – within the corridor, the overheating or the stagnating zone – of an economic body. The causal factors are in the real sector on the first part and to a large degree in the financial sector of an economy on the succeeding part.

Furthermore, dynamic industries, such as the IT-sector in the 90s, will incite the attention and the interest of all those economic actors who desire to participate in the boom in fast growing domains as financial investors and who will want to also enjoy the high returns achievable. The technology driven expansion in the dynamic part of the industrial sector will then be spurred and artificially inflated in the asset part of the financial sector and might even be triggered to a boom by the greed and short-term focus of the financial investors (see for example Minsky 1990).

It is this finance-based overheating that can topple the whole economy into a severe crisis. This will always happen when we observe a situation where the market is full of fear of inflation and where the monetary policy is quickly shifted from an expansion to a contraction strategy. Just as we can see in the examples of Japan and the USA, this will lead in most cases to a panicking reaction of private investors in the financial markets. They suddenly see their return opportunities going down the drain and try to save all they can. Financial bubbles that had been built up in the time leading to this point will burst and in its wake will tear down the industrial part of the economy. The more important and faster a technology induced expansion develops into a financial boom and the more interconnected an economy is in the global economic sphere, the more global and dramatic the consequences and crises will appear.

The only sensible path for a future-integrated, continuous and sustainable development of an economy or of an economic system is a political strategy of having monitored, moderate overall growth with a corresponding rate of development (see for example McCraw 2008). Only then all structures, both in the real and the financial sectors, can advance within the Neo-Schumpeterian Corridor in a “healthy”, co-evolutionary way. So it is the government and the central banks that bear the responsibility to generate an almost natural balancing between “Fast” and “Slow”, between “Dynamics” and “Statics”, between “New” and “Old”. The fast growing industries must have the possibility to expand without risking having their dynamics devitalized by the more sluggish sectors. On the other hand, the latter are supposed to form a natural brake that prevents the development of excessive dynamics, both in the industrial and in the financial sector. It is the responsibility of the public sector to provide for a framework which is designed in a way that hardships in the present - such as can arise in regular cyclical recessions – can be shouldered and that successful developments in the future are stimulated. An economic system can achieve such a secure long-term strategy which minimizes the risks of a boom as well as those of a drastic crisis exclusively only, if it moves within the Neo-Schumpeterian Corridor, if possible at its upper end.

The idea of such a corridor however presupposes that the political sphere can actively decide on the framework and take the appropriate measures that can effectively and timely tame and dominate those forces in a capitalistic system which continuously try to go through the roof and risk exiting the corridor towards an excessive growth path. On the other hand, politicians have to make sure that an economy will not fall out of the corridor, and that it will not have to cope with economic stagnation. Probably the greatest challenge for academia and politics in the next years will be to bring this Neo-Schumpeterian Corridor to life by providing the economic and political content of implementing the right strategy.

5 The dynamic patterns of the future-orientation of the public sector in a CNSE-perspective

In this last section we apply the CNSE approach empirically in order to detect different designs of future-orientation of the public sectors in European economies. Promising possibilities to approach the future-orientation of the public sector from a positive-empirical dimension are so-called indicator-based models. International comparisons become possible by applying a comprehensive set of indicators describing the future-orientation of the public sector to a cluster analysis, which identifies economies with similar compositions and separates them from economies with different set-ups concerning their future-orientation. Without doubt, the future-orientation of CNSE entails also the dynamics as well as the potential for self-transformation of the public sector. In time, new patterns of future-orientation of the public sectors are to be expected which allow conclusions concerning country-specific development profiles.

In Hanusch and Pyka (2007d) we investigate European Economies and the future-orientation of their public sectors. The indicators applied in this model are listed in table 1.

• GOVERD (Government Expenditure on R&D) in percent of GDP, 2000, 2005
• GOVERD, average 1991 to 2000, average 2000 to 2005
• GERD (Gross Domestic Expenditure on R&D) in percent of GDP, 2000, 2005
• GERD, average 1991 to 2000, average 2000 to 2005
• Tax burden for companies (corporate income tax, highest level, on non-distributed gains, reciprocal values), 2001, 2005
• Tax burden for households (highest level of income tax, reciprocal values), 2001
• Index of political stability, 2002, 2005
• Index of regulatory quality (higher values indicating lower regulatory burden), 2002, 2005
• Quality of internet access, broadband penetration rate, 2001, 2005
• Number of personal computers per 100 inhabitants, 2001, 2005
• Internet users per 100 inhabitants, 2001, 2005
• Business internet penetration, number of internet hosts per 10,000 inhabitants, 2001, 2005
• Number of secure internet servers per million inhabitants, July 2001, 2005
• Employment rate of the population that has attained tertiary education and is aged 25-

64, 1999, 2005
• Perceived R&D subsidies, 2001, 2005
• Perceived R&D tax credits, 2001, 2005
• Tax treatment of R&D for large manufacturing firms, 1999-2000, 2004-2005
• Tax treatment of R&D for small manufacturing firms, 1999-2000, 2004-2005
• Number of scientific publications per million population, 1999, 2005
• Percentage of scientific publications with a foreign co-author, 1995−1997, 2003-2005
• Percentage of the population of 25- to 34- year-olds that has attained tertiary education, average 1993-2000, 2001-2005
• Total expenditure on non-tertiary education in % of GDP as of 2000, 2005
• Total expenditure on tertiary education in % of GDP, 2000, 2005
• HERD in % of GDP, 2000, 2005
• Teaching staff per 1,000 students in primary and secondary educational establishments, 2001, 2005
• Graduation rates at PhD level, 2001, 2005
• Total public expenditure on education, all educational levels combined, 2000, 2005
• Change in expenditure on educational institutions (1995, 2002) (2002, 2005)

Table 1: Indicators describing the future-orientation of the public pillar

These indicators were applied to a cluster-analysis (for details concerning the method see Balzat and Pyka 2006) in order to detect commonalities and differences in the respective future-orientation as well as the underlying pattern dynamics.

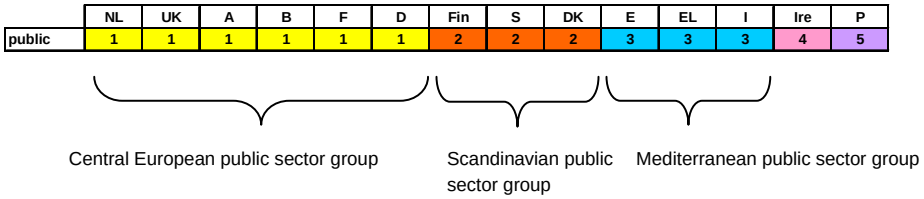


Figure 2: Country clusters of the public sector 2000

The pattern of clusters in the future-orientation of public sectors (figure 2) for the year 2000 is strongly geographically determined. This particular pattern corresponds strongly with patterns identified in the varieties of capitalism approach (e.g. Amable 2003). We find three larger clusters, a central European, a Scandinavian and a Mediterranean public sector group. For the group of Scandinavian countries, a common alignment in one cluster clearly follows the idea of the Scandinavian welfare state which shapes the design of the public sector even

visible with regard to the future orientation. This holds particularly for the education and science sector and the importance which is attached to a highly developed public infrastructure.

Obviously different enough to the Scandinavian strong welfare-orientation, the clustering algorithm identifies a Central European public sector group. Here the social responsibility of the public sector is also pronounced, but the particular public areas with a high future orientation (e.g., the education system and the knowledge infrastructure) seem to play a minor role.

Concerning the Mediterranean public sector group encompassing Spain, Greece and Italy, the public sector has a different influence on economic life compared to the Scandinavian and Central European cluster. One can assume a less dominant role in the social domain as well as in the domains of futurity. Of particular note, the education and knowledge system as well as the future-oriented public infrastructure seems to be less important.

Ireland and surprisingly also Portugal form their own country clusters and are therefore identified as structurally different to the other three European clusters.

Finally, the clusters of the public sectors' future-orientation of the European economies in the period from 2001 to 2005 are identified and displayed in figure 3. Within this five years period strong changes can be identified: The large European economies – United Kingdom, France and Germany – make up one cluster, whereas the smaller economies – Denmark, the Netherlands, Belgium and Austria – are incorporated into another cluster. It seems as if the size of the economies influences the future orientation of the public sectors. A third larger cluster is composed of the Mediterranean countries with Italy, Spain, Portugal and Greece. The other three clusters are single country clusters including Finland, Ireland and Sweden.

	NL	A	B	DK	F	D	UK	Fin	E	EL	I	P	Ire	S
public	1	1	1	1	2	2	2	3	4	4	4	4	5	6

Figure 3: Country clusters of the public sectors 2005

Only the Mediterranean cluster is characterized by certain stability. In a way, the consistency of this cluster is even strengthened as Portugal has now joined the group of the other Mediterranean economies with respect to the future orientation of its public sector. However, the other geographic consistency concerning the public pillar which we detected in the 2000 pattern, namely the clustering of the Scandinavian countries is no longer visible. Finland and Sweden constitute single country clusters, and the future orientation of Denmark's public sector is identified as being similar to the one of the smaller European countries.

The focus on the pattern dynamics clearly is an advantage of the CNSE approach compared to the varieties of capitalism approach which has due to its systemic nature difficulties in depicting dynamics. A further advantage of this fine-resolution picture of varying public sectors' future orientation as well as their dynamics allows a correlation of the growth performance of the economies with their future-orientation make-up (Hanusch and Pyka 2007d) as well as an allocation of the economies into the Neo-Schumpeterian corridor: Ireland, e.g. is an economy which we found in 2007 to be above the corridor and had a high risk of falling prey to this fast development. As we have seen during the current crisis, it did have major troubles coping with the changing environment and had to suffer severe backlashes. Germany, on the other hand, was a country well below the corridor and managed to get back inside before the crisis hit. So, it could better cope with this situation.

6 Conclusions

In economics, there is a wide agreement on the importance of innovation for economic growth and development. Neo-Schumpeterian Economics is best suited for the economic analysis of innovation processes because concepts were developed which allow dealing with important characteristics of innovation like true uncertainty, irreversibilities and bounded rationalities. So far this strong innovation-orientation is applied almost exclusively in the analysis of industrial innovation. We argue that only a pronounced innovation-orientation which encompasses besides industry also financial markets as well as the public sector will allow a sound understanding of the (co-)evolutionary development processes typical for capitalistically organized economies. For this purpose, the innovation principle is applied as a normative principle for a Comprehensive Neo-Schumpeterian Economics (CNSE) approach.

This paper summarizes the implications of the CNSE approach for an economic theory of the state. This is done from a normative perspective highlighting the need for public interventions as well as from a positive-empirical perspective highlighting the empirical conditions for the increasing importance of public interventions into economic processes.

It is shown that in particular the shift from the framework setting role towards the governance role of the public actor which simultaneously shapes the transition from a manufacturing-based economy to a knowledge-based economy requires the CNSE perspective for a comprehensive analysis of the underlying dynamic and co-evolutionary processes. The empirical investigation of the future-orientation of the public sectors in Europe shows, that there is no optimal design but different approaches with which European economies succeed and/or fail to stay within the Neo-Schumpeterian Corridor of prolific economic development.

The CNSE approach of the public sector is far away from being fully developed yet. In particular distribution issues and social justice are so far only moderately considered. Furthermore, the normative approach is in need of a Schumpeterian complement to the traditional welfare concepts which will allow for policy recommendations to improve the future-orientation of the economic system. This could eventually also enable us to integrate the fundamental issues in the societal development such as climate change, energy security or aging societies as well as proposed solutions into a panoptic framework.

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