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The 'managed' and the 'entrepreneurial' economy

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1. Introduction

Capital and labour were the essential factors utilized in large scale production that dominated the business world until the late 1980s. The increasing level of transaction costs (Coase, 1937) incurred in large scale production dictated increasing firm size over time. This was made possible by the predictable development of technology, consumer preferences, and procurement of resources. Statistical evidence points towards an increasing role of large enterprises in the economy in this period (Caves, 1982; Teece, 1993; Brock and Evans, 1989). This development towards large scale activity was visible in most developed economies. In this same period, the importance of self-employment and small business seemed to be waning. Although it was recognized that the small business sector was in need of protection for both social and political reasons, there were few that made this case on the grounds of economic efficiency. Small wonder that, while exploring the sources of economic growth, Robert Solow (1956 and 1957) comes up with a model where capital and labour are the main drivers.

Romer (1986 and 1990), Lucas (1988), and in a later phase Jones (1996) and Young (1998) discover that the traditional production factors of labour and capital are not sufficient in explaining long-term growth. Knowledge becomes a vital factor in endogenous growth models. Technological development is seen as exogenous in neoclassical growth theory. That is why the long-term growth of labour productivity remains unexplained. Endogenous growth theory provides models explaining this long-term growth using knowledge. Knowledge has typically been measured in terms of R&D, human capital, and patented inventions. Many scholars have predicted that the emergence of knowledge as an important determinant of growth and competitiveness in global markets would render self-employment and small firms even more futile. How could they generate the means and insights to exploit R&D activities, to employ highly trained knowledge workers, and to bring their efforts to the patent or even the commercial stage? Vernon (1970) predicts increased globalisation to present an even more hostile environment to small business. Caves (1982) argues that the additional costs of knowledge activity constitute an important reason for expecting foreign investments to be mainly an activity of large firms. Chandler (1990) concludes that one has to be big in order to compete globally. Basically, they all conclude that with the arrival of knowledge as a production factor the world of business becomes dominated by exporting giant firms. This is the world of global markets, global products, and global players. Small firms were thought to be at a disadvantage vis-à-vis larger firms because of the fixed costs of learning about foreign environments, communicating at long distances, and negotiating with national governments. Consolidation seems to have become a law of nature, while the number of global players declines continuously. In this period of the 1970s and 1980s a range of science fiction literature becomes popular where one global player

survives in a totalitarian environment.[1] This is 'big brother' generated by the merger of the last remaining firm and the last remaining sovereign nation state. The most outstanding science fiction writer of all times, Karl Marx, already predicted much earlier that the advantages of large scale production would inevitably drive out small business.

Despite these forces, small and young firms have returned as the engine of economic and social development throughout the world. This return required a dramatic economic switch. Audretsch and Thurik (2001a and 2004) call this the switch from the managed economy to the entrepreneurial economy. The model of the managed economy is the political, social, and economic response to an economy dictated by the forces of large scale production, reflecting the predominance of the production factors of capital and (mostly unskilled) labour as the sources of competitive advantage. By contrast, the model of the entrepreneurial economy is the political, social, and economic response to an economy increasingly dominated by knowledge as production factor, but also by a different, yet complementary, factor that had been overlooked: entrepreneurship capital, or the capacity to engage in and generate entrepreneurial activity. Without new and young firms it is not straightforward that knowledge or R&D always spills over to an environment where it leads to tangible products.[2]

The purpose of this paper is to present the distinction between the models of the managed and entrepreneurial economies and to explain why the model of the entrepreneurial economy is a better frame of reference than the model of the managed economy when explaining the role of entrepreneurship in contemporary, developed economies (Thurik, 2008). The first I will do by showing the relation between a measure for entrepreneurship capital (the prevalence of early stage entrepreneurial activity) and two measures of economic development. It suggests that there are two different economies. The second I will do by contrasting the fundamental elements of the managed economy model with those of the entrepreneurial economy model. Following Audretsch and Thurik (2001a and 2004) and Thurik (2008), fourteen characteristics are identified as the basis for comparing models of the entrepreneurial and the managed economy. The common thread throughout these characteristics is the important role of new and small enterprises in the entrepreneurial economy model (as compared to that of the managed economy). Understanding the distinction between the models of the entrepreneurial and managed economies is vital for explaining why the causes and consequences of entrepreneurship differ in the managed and the entrepreneurial economies (Wennekers, Uhlaner, and Thurik, 2002; Thurik, Wennekers, and Uhlaner, 2002). Insight in the causes and consequences of entrepreneurship is indispensable for shaping and justifying policy measures

[1] Ray Bradbury's *Fahrenheit 451*, Aldous Huxley's *Brave New World*, George Orwell's *1984*, et cetera.

[2] This process is known as 'breaking the knowledge filter': entrepreneurs are willing to spend costs to use existing but outside knowledge for their own production process. They provide a vital link between knowledge and productivity gains. See Acs, Audretsch, Braunerhjelm, and Carlsson (2004) and Audretsch, Aldridge, and Oettle (2006). Erken, Donselaar, and Thurik (2008) show that entrepreneurship, next to R&D, plays a role explaining 'total factor productivity' for OECD countries in a recent period.

(Audretsch, Grilo, and Thurik, 2007). An economy based upon managing production requires totally different conditions than one where entrepreneurship capital needs to be stimulated (Audretsch, 2007b). It can even be that policies and institutions which made the managed economy successful are contra productive in the entrepreneurial economy.

2. Importance, insights, questions and limitations

Before describing the managed economy, the emergence of the entrepreneurial one and contrasting them in a framework of fourteen characteristics I will first provide a small tour d'horizon of why the present paper is important, what its most important insights are and what remains in terms of questions and limitations.

Entrepreneurship has emerged as an important element in the organization of economies. It has re-emerged from an era where mainstream thinking dictated a future where ever bigger organizational hierarchies would dominate. This emergence did not occur simultaneously in all developed countries. Differences in growth perspectives are often attributed to differences in the speed countries adapt to a modern world of business and communication. In this reorganization entrepreneurship is assumed to play a major role. The recognition that entrepreneurship helps fostering growth led to the political mandate to promote entrepreneurship. Hence, a clear and organized view is needed of what the determinants of entrepreneurship are. Entrepreneurship, its drivers and its consequences can be best understood using a model of the entrepreneurial economy which explains the functioning of the modern economy. The present contribution provides such a model. It has two principle characteristics: it is built up contrasting the modern entrepreneurial economy with its predecessor and it discriminates between fourteen dimensions.

There are two main insights. First, the entrepreneurial economy is omnipresent. It is not confined to the role of small businesses and business owners. It is the pervasive socio-economic mindset of thinking in terms of opportunities rather than in terms of resources. It is thinking away from 'count one's blessings' and towards 'tolerating newness and absorbing uncertainty'. It is based upon ideas and knowledge rather than on investments creating more of the same. It is based upon persons rather than on organizations. Hence, some analysts advanced the concept of the entrepreneurial society (Audretsch, 2007a). Secondly, while I made an attempt to clarify the entrepreneurial economy contrasting it to the managed economy, the managed economy aspect is far from dead in the modern economy: there are many products (bulky ones in the lower parts of the production chain) and services (distribution and communication networks) which can be best offered in a routinized and predictable fashion. Where the central theme of the entrepreneurial economy is exploration and that of the managed one is exploitation, the modern economy contains many exploitation processes.

Accepting that entrepreneurship is a necessary prerequisite for economic growth in the modern economy, the essential question remains how the proposed model translates into policy guidelines. A first attempt is made within the proposed model itself by introducing four policy characteristics: goals, target, locus and financing. Elsewhere I advanced a policy framework discriminating between six channels of policy interventions to foster entrepreneurship (Thurik, 2008). The combinations of the current model and the policy framework together with the recognition that entrepreneurship is a cultural phenomenon which can only be influenced in the long run, should provide policy makers and researchers with a full agenda of discussion points. A major issue is the role of education determining the entrepreneurial culture and which elements of education are prominent in this determination.

The proposed model of the entrepreneurial economy is conceptually independent of the level of economic development. In that sense it applies to developing countries as well as to development countries. However, the issues developing countries are faced with are primarily concerned with the move from a rural to a managed economy: the quest for consolidation is important. This cannot be done without the entrepreneurial incentive but has a different and partly political loading. Furthermore, it is culture rather than regulation which determines whether entrepreneurship thrives and in many developing countries business is dominated by the incumbent and privileged who are not open to entrepreneurial newness. The present contribution aims at developed countries.

Throughout the present contribution my unit of observation is country. All concepts and ideas can equally be applied to regions or industries. Given that regions across developed economies vary more than countries in terms of growth (potential), the region is an untapped source of research of the drivers and consequences of entrepreneurship.

3. The managed economy

Until the late 1980s the large enterprise was the dominant form of business organization (Schumpeter, 1942; Chandler, 1990). The decrease in the role of small business in developed countries after the Second World War is well documented. This is the era of mass production where economies of scale become the decisive factor in dictating efficiency. In this era John Kenneth Galbraith (1956) proposes his idea of countervailing power, where the power of ‘big business’ is balanced by that of ‘big labour’ and ‘big government’. There is no mention of ‘small businesses’. The corporatist organisation of societies goes very well together with the managed economy. Whyte (1960), Chandler (1977), Piori and Sabel (1984), and many others show that stability, continuity, and homogeneity are the cornerstones of the managed economy. Large firms dominate this economy while Taylorism, Fordism, and Keynesianism are central concepts. One of the best descriptions of the large enterprise and its domination of the managed economy is given in *The Economist* (December 22nd, 2001, p. 76): “*They were hierarchical and*

bureaucratic organizations that where in the business of making long runs of standardized products. They introduced new and improved varieties with predictable regularity; they provided workers with life-time employment; and enjoyed fairly good relations with the giant trade unions".

Also until late in the 1980s small firms are viewed as a luxury, as something Western countries need to ensure the infrastructure and safety of inner cities, to absorb part-time and low skilled labour, to help decentralization of decision making, to safeguard the oldest of all business models - the family firm -, et cetera. One took for granted that they survived only at the cost of efficiency. It is not surprising that many scholars from many academic disciplines have sought to create insight into the issues surrounding this perceived trade-off between economic efficiency and political and economic decentralization (Williamson, 1975). These scholars have produced a large number of studies focusing mainly on three questions: (1) What are the gains to size and large scale production?, (2) What are the economic and welfare implications of an oligopolistic market structure, i.e., is economic performance promoted or reduced in an industry with just a handful of large scale firms?, and (3) Given the overwhelming evidence that large scale production and economic concentration is associated with increased efficiency, what are the public policy implications? The alleged success of the communist, centrally-led economies plays a huge role in the prevailing way of thinking of that era. These economies thrived on uniform, stable mass production. It is straightforward that entrepreneurship is viewed as behaviour hostile to the communist system and declared criminal. How ironic that these economies broke down in the late 1980s due to a total lack of decentralized, experimental, free, risky and small-scale economic activities.

4. The emergence of the entrepreneurial economy

While business schools thrive training young people for jobs in large scale operations, these same schools house researchers establishing a revival of small-scale operations. In the late 1980s and early 1990s, Birch (1987), Brock and Evans (1989), Loveman and Sengenberger (1991), and Acs and Audretsch (1993) come across fascinating data material: the share of smallness varies in modern economies, but increases everywhere. In the United States the average real GDP per firm increased by nearly two-thirds between 1947 and 1989 – from $150,000 to $245,000 – reflecting a trend towards larger enterprises and a decreasing importance of small firms. However, within the subsequent seven years it had fallen by about 14 percent to $210,000, reflecting a sharp reversal of this trend and the re-emergence of small business (Brock and Evans, 1989). Similarly, small firms accounted for one-fifth of manufacturing sales in the United States in 1976, but by 1986 the sales share of small firms had risen to over one-quarter (Acs and Audretsch, 1993).

Such a U-shaped relation between number of firms and time, or inverse U-shaped relation between average firm size and time, seems to be ubiquitous. There is much debate about its

meaning, but two things seem evident: the trough, or the summit, is not determined by the calendar year but by the level of economic development of a country. It is as if the trough, or the summit, marks a regime switch. The first can be best illustrated using the material of the Global Entrepreneurship Monitor (GEM). The second is documented by Audretsch and Thurik (2001a and 2004) distinguishing between the managed and the entrepreneurial economy.

Table 1 shows the results of a linear regression estimation where the total entrepreneurial activity (TEA) index is 'explained' using the level of economic development of countries. The TEA index is the number of 'nascent' and new entrepreneurs as a percentage of the population between 18 and 65 years of age.[3] Following Wennekers, van Stel, Thurik, and Reynolds (2005), two measures of the level of economic development are used: per capita income (in purchasing power parities) and the innovation index as computed by the authoritative World Economic Forum (WEF, 2007).[4] We test for the presence of a U-curved relation by also taking the 'squared' level of economic development. Using 2007 observations from 42 countries we observe that the results are similar to those of the 2002 data used in Wennekers, van Stel, Thurik, and Reynolds (2005): there is a strong U-shaped relation between entrepreneurship and level of economic development. The U-shape seems somewhat stronger in the case of per capita income (t-value is 2.8) than in the case of the innovation index (t-value is 1.9). The stability of the U-shape over the years (the relation is established both in 2002 and 2007) provides empirical support for the idea that something fundamental happened in the economy and that this has to do with the role of entrepreneurship capital. I am aware that I attempt to draw conclusions with a time dimension using (cross-section) country data without one. This is allowed because the 42 countries have strongly diverging levels of economic development so that the temporal effect is implicit: countries tend to grow in terms of economic development.

[3] Nascent entrepreneurs are busy setting up a business and have taken important steps. New entrepreneurs have businesses of less than three and a half years old.

[4] The 12th dimension of the so-called Global Competitive Index (WEF, 2007, p. 20) is used.

Table 1 Relating total entrepreneurial activity (2007) to the level of economic development, as measured by per capita income and innovative capacity

	model 1: U-curved relationship with per capita income	model 2: U-curved relationship with innovative capacity
Constant	21.4*** (7.2)	57.4*** (3.0)
Per capita income	-1.01*** (3.5)	
Per capita income, squared	0.016*** (2.8)	
GCR Innovative Capacity Index		-21.2** (2.2)
GCR Inn. Cap. Index, squared		2.15* (1.9)
Adjusted R^2	0.335	0.232
Observations	42	42

Absolute t-values between parentheses.

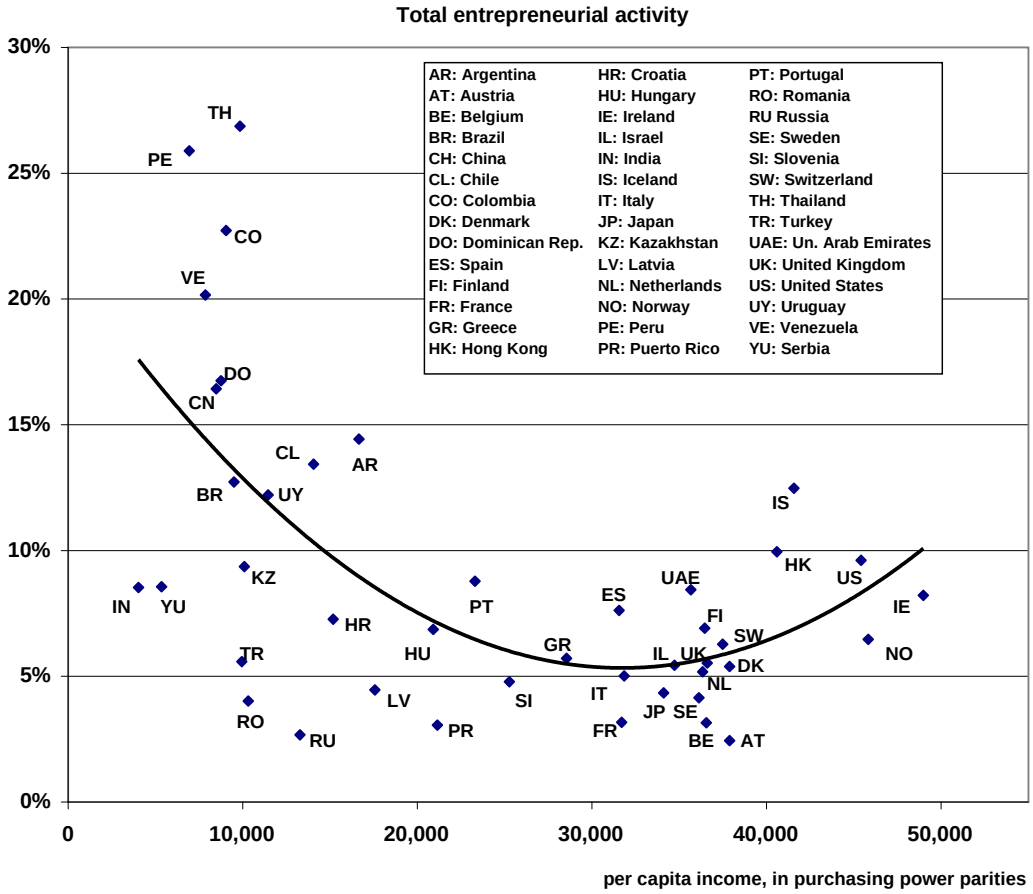
*** Significant at 0.01 level; ** Significant at 0.05 level; * Significant at 0.10 level

The values of the adjusted R^2 (0.335 and 0.232) are certainly not low since this measure of 'explanation' on the right hand side of the equation is based upon just one phenomenon. However, obviously, there are many more phenomena influencing the relation between the level of entrepreneurship and that of economic development. These phenomena should capture all kinds of economic, technological, demographic, and institutional differences. Wennekers, van Stel, Thurik, and Reynolds (2005) show that correction for several of these phenomena does not affect the U-shape relation. In Figure 1 a picture is drawn of the data and the estimated relation of model 1 where total entrepreneurial activity (prevalence of early stage entrepreneurial activity) is related with per capita income (GDP per capita, in purchasing power parities).

By reporting the above regression results I do not want to suggest that they describe the way entrepreneurship influences economic development. The relation between entrepreneurship and economic development is very complex. There are two causalities, lagged effects,

measurement issues, and several opposite effects (Thurik, Carree, van Stel, and Audretsch, 2008). I just want to emphasize that a regime switch occurred.

Figure 1 Total entrepreneurial activity (TEA) and GDP (model 1)



Source: Bosma, Jones, Autio, and Levie (2008).

5. Contrasting the entrepreneurial and managed economy models

The occurrence of a regime switch suggests two contrasting models with a differing role of entrepreneurship. The model of the managed economy revolves around the links between stability, specialization, homogeneity, scale, certainty, and predictability on the one hand and economic growth on the other. By contrast, the model of the entrepreneurial economy focuses on the links between flexibility, turbulence, diversity, novelty, innovation, linkages, and clustering on the one hand and economic growth on the other. The models of the managed and the entrepreneurial economy can be compared by distinguishing between different groups of characteristics, including underlying forces, external environment characteristics, internal or firm

characteristics, and policy characteristics. I will try and distinguish 14 characteristics. See Audretsch and Thurik (2001a and 2004) for more examples and references.[5]

5.1. Underlying forces

The first group of characteristics consists of three important underlying forces: localization versus globalisation; change versus continuity; and jobs and high wages versus jobs or high wages.

In the model of the managed economy production labour and capital are the dominant production factors. The more mobile capital moves to where the cheapest labour (software) is or such labour moves towards capital once it is invested in plants (hardware). Knowledge is the dominant factor of production in the model of the entrepreneurial economy. It is more than just hard technical and scientific knowledge. It also comprises soft aspects like creativity, the ability to communicate, emotional intelligence, et cetera. The competitive advantage in the entrepreneurial economy is driven by innovative activity, while knowledge spillovers are an important source of this innovative activity. Hence, in the model of the entrepreneurial economy local proximity is important, with the region being the most important locus of economic activity, as knowledge tends to be developed in the context of localized production networks embedded in innovative clusters.

The model of the managed economy focuses more on continuity, while the model of the entrepreneurial economy thrives on change and even provokes it. Although innovation is present under the conditions of both change and continuity, the nature and the locus of innovative activity differ. The well-known distinction between incremental and radical innovations is helpful to elucidate this. Innovations are considered incremental when they are compatible with the core competence and technological trajectory of the firm or the industry. By contrast, a radical innovation can be defined as extending beyond the boundaries of the core competence and the technological trajectory of the firm or the industry. In the model of the managed economy change is absorbed within a given technological paradigm: the successful firm excels at incremental innovation. By contrast, in the model of the entrepreneurial economy, the capacity to break out of the technological lock-in imposed by existing paradigms is enhanced by the ability of economic agents to start new firms. Thus, incremental innovative activity along with diffusion plays a more important role in the model of the managed economy. While often requiring large investments in R&D, this type of innovative activity generates incremental changes in products along the existing technological trajectories. On the other hand, in the entrepreneurial economy model the competitive advantage of the high-cost location demands innovative activity earlier in the product life cycle and which is of a more radical nature.

[5] Also see Audretsch (2007) for a brilliant and proficient but less organized account of the switch from the managed to the entrepreneurial economy.

One of the most conspicuous policy options in the model of the managed economy is that unemployment can be reduced only at the cost of lower wages. In the model of the entrepreneurial economy high employment can be combined with high wages and a low wage level does not necessarily imply high employment. An indication of the absence of a trade-off between high wages and employment is the large variance in unemployment rates across OECD countries, although corporate downsizing has been ubiquitous. Small firms in general and new ventures in particular, are the engine not only of employment creation[6], but also of productivity (Erken, Donselaar, and Thurik, 2008). This is not due to the wage differential between small and large firms. On the contrary, the growth of new firms may not only generate greater employment, but also higher wages. New firm growth ensures that higher employment does not come at a cost of lower wages, but rather the opposite – higher wages. Under the model of the managed economy the job creation by small firms is associated with lower wages. Hence, while small firms generate employment at a cost of lower wages in the model of the managed economy, in the entrepreneurial economy model small firms may create both more jobs and higher wages (Acs, Fitzroy and Smith, 2002; Scarpetta, Hemmings, Tressel, and Woo, 2002).

5.2. External environment

The second group of characteristics contrasts the external environment characteristics in the models of the managed and the entrepreneurial economies. Turbulence, diversity, and heterogeneity are central to the model of the entrepreneurial economy. By contrast, stability, specialization and homogeneity are the cornerstones of the model of the managed economy.

Stability in the model of the managed economy results from a homogeneous product demand, resulting in a low turnover rate of jobs, workers, and firms. The model of the entrepreneurial economy is characterized by a high degree of turbulence. Each year many new firms are started and only a subset of these firms survives. Nelson and Winter (1982) argue that the role of diversity and selection is at the heart of generating change. This holds for both the managed and the entrepreneurial economy model. However, what differs in these models is the management and organization of the process by which diversity is created as well as the selection mechanism. In the model of the managed economy research activities are organized and scheduled in departments devoted to developing novel products and services. The management of change fits into what Nelson and Winter (1982) refer to as the 'firm's routines'. The ability of incumbent businesses to manage the process of change pre-empts many opportunities for entrepreneurs to start new firms, resulting in a low start-up rate and a stable industrial structure. In the model of the entrepreneurial economy the process of generating new ideas, both within and outside of R&D laboratories, creates a turbulent environment with many opportunities for entrepreneurs to start new firms based upon different and changing opinions

[6] See special issue of *Small Business Economics* (Vol. 30, nr. 1, 2008) and in particular Fritsch (2008).

about different and changing ideas. In short, the innovation process in the managed economy is closed whereas that in the entrepreneurial economy is open.

Several theoretical arguments have suggested that the degree of diversity versus that of specialization accounts for differences in rates of growth and technological development (Acs, Fitzroy, and Smith, 2002). Specialization of industry activities is associated with lower transaction costs and, therefore, greater (static) efficiency. Diversity of activities is said to facilitate the exchange of new ideas and, therefore, greater innovative activity and (dynamic) efficiency. Because knowledge spillovers are an important source of innovative activity, diversity is a prerequisite in the model of the entrepreneurial economy where lower transaction costs are preferably sacrificed for greater opportunities for knowledge spillover. In the model of the managed economy, there are fewer gains from knowledge spillovers. The higher transaction costs associated with diversity yield little room for opportunities in terms of increased innovative activity, making specialization preferable in the model of the managed economy.

The trade-off between diversity and specialization focuses on firms while that between homogeneity and heterogeneity focuses on individuals. Modern communication and transport techniques destroyed many barriers. In a heterogeneous population of the entrepreneurial economy, communication across individuals tends to be more difficult and costly than in a homogenous population: transaction costs are higher and efficiency is lower. At the same time, new ideas are more likely to emerge from communication in a heterogeneous than in a homogeneous world. Although the likelihood of communication is lower in a heterogeneous population, communication in this environment is more prone to produce novelty and innovation.[7] The lower transaction costs resulting from a homogeneous population in the model of the managed economy are not associated with high opportunity costs, because knowledge spillovers are relatively unimportant in generating innovative activity. However, knowledge spillovers are a driving force in the model of the entrepreneurial economy, offsetting the higher transaction costs associated with a heterogeneous population.

5.3. How firms function

The third group of characteristics contrasts firm behaviour in the models of the managed and the entrepreneurial economy: control versus motivation; firm transaction versus market exchange; competition and cooperation as substitutes versus complements; and scale versus flexibility.

Under the model of the managed economy labour is considered as indistinguishable from the other input factors. It is considered homogeneous and easily replaceable. Firms organize their labour according to the principles of command and control. Under the model of the entrepreneurial economy, the command and control approach to labour is less effective, as the

[7] The concept of 'optimal cognitive distance' is connected to this phenomenon (Nooteboom, Vanhaverbeke, Duysters, Gilsing, and van den Oord, 2006).

competitive advantage of the advanced industrialized countries tends to be based on creating and validating new knowledge. This is accomplished by motivating workers to facilitate the discovery process and implementation of new ideas. Management styles emphasize the nurturing of interpersonal relationships facilitating rather than supervising employees. In the entrepreneurial economy model, the focus of activities is on exploring new abilities, rather than exploiting existing ones.

Transaction costs economics distinguishes between exchange via the market and intra-firm transactions. Both Coase (1937) and Williamson (1975) emphasize that uncertainty and imperfect information increase the cost of intra-firm transactions. Knight (1921) argues that low uncertainty, combined with transparency and predictability of information, make intra-firm transactions efficient relative to market exchange. In the managed economy model, where there is a high degree of certainty and predictability of information, transactions within firms tend to be more efficient than market exchange. By contrast, in the entrepreneurial economy model market transactions are more efficient because of the high uncertainty. Since the mid-1970s the economic arena has become increasingly uncertain and unpredictable (Carlsson, 1989), witnessed by a decrease in both mean firm size and the extent of vertical integration and conglomeration.

Models of competition generally assume that firms behave autonomously, whereas models of cooperation assume pervasive linkages among firms. These linkages take various forms, including joint ventures, strategic alliances, and (in)formal networks, et cetera. In the model of the managed economy, competition and cooperation are viewed as being substitutes. Firms are vertically integrated and primarily compete in product markets. Cooperation between firms in the product market reduces the number of competitors and reduces the degree of competition. In the model of the entrepreneurial economy, firms tend to be vertically independent and specialized in the product market. The higher degree of vertical disintegration under the model of the entrepreneurial economy implies a replacement of internal transactions within a large vertically integrated corporation with cooperation among independent firms. At the same time, there are more firms, resulting in an increase in both the competitive and cooperative interfaces. The likelihood of a firm competing or cooperating with other firms is higher in the entrepreneurial economy model.

Under the model of the managed economy costs-per-unit are reduced through exploiting economies of scale. In product lines and industries where a large scale of production translates into a substantial reduction in average costs, large firms will have an economic advantage, leading to a concentrated industrial structure. Stable and predictable products, consumer tastes, and lines of resource provision contributed to the success of the exploitation of economies of scale. The importance of scale economies has certainly contributed to the emergence and dominance of large corporations in heavy manufacturing industries, such as steel, automobiles,

and aluminium (Chandler, 1977). The alternative source of reduced average costs is flexibility (Teece, 1993), characterizing the entrepreneurial economy model. Industries where demand for particular products is shifting constantly require a flexible system of production that can meet such a whimsical demand.

5.4. Government policy

The final group of contrasting characteristics of the models of the entrepreneurial economy and the managed economy refers to government policy (Audretsch, Grilo and Thurik, 2007), including the goals of policy (enabling versus constraining), the target of policy (inputs versus outputs), the locus of policy (local versus national), and financing policy (entrepreneurial versus incumbent).

Under the model of the managed economy public policy towards the firm is essentially constraining in nature. There are three general types of public policy towards business: antitrust policy (competition policy), regulation, and public ownership. All three of these policy approaches restrict the firms' freedom to contract. Under the model of the managed economy the relevant policy question is: How can the government withhold firms from abusing their market power? The entrepreneurial economy model is characterized by a different policy question: How can governments create an environment fostering the success and viability of firms? Whereas the major issues in the model of the managed economy are concerns about excess profits and abuses of market dominance, in the model of the entrepreneurial economy the issues of international competitiveness, growth, and employment are important. In the managed economy model the emphasis is on constraining market power through regulation, whereas the focus in the entrepreneurial economy model is on stimulating firm - or rather industrial - development and performance through enabling policies.

Governmental policy can involve targeting selected outputs in the production process versus targeting selected inputs. Because of the relative certainty regarding markets and products in the model of the managed economy, the appropriate policy response is to target outputs. Specific industries and firms can be promoted through government programs. Whereas in the model of the managed economy production is based on the traditional inputs of land, labour, and capital, in the entrepreneurial economy model it is mainly based on knowledge input. There is uncertainty about what products should be produced, how and by whom. This high degree of uncertainty makes it difficult to select appropriate outcomes and increases the likelihood of targeting the wrong firms and industries. Hence, the appropriate policy in the model of the entrepreneurial economy is to target inputs and in particular those inputs related to the creation and commercialization of knowledge. Government becomes the facilitator creating links and networks, creating forms of social innovation, proposing incentives to firms and knowledge institutes, stimulating special and functional flexibility of labour, et cetera.

The locus of policy is a third characteristic where the models of the managed and entrepreneurial economy differ. Under the model of the managed economy the appropriate locus of policy making is the national or federal level. The most important policy making institutions tend to be located at the national level, although the targeted recipients of policy may be localized in one or a few regions. Under the model of the entrepreneurial economy, government policy towards business tends to be decentralized and regional or local in nature. This distinction in the locus of policy results from two factors. *Firstly*, because the competitive source of economic activity in the model of the entrepreneurial economy is knowledge, which tends to be localized in regional clusters, public policy requires an understanding of regional-specific characteristics and idiosyncrasies. *Secondly*, the motivation underlying government policy in the entrepreneurial economy is growth and the creation of jobs, to be achieved mainly through new venture creation. New firms are usually small and pose no oligopolistic threat in national or international markets. In the model of the entrepreneurial economy, no external costs – in the form of higher prices – are imposed on consumers in the national economy as is the case in the model of the managed economy. Fostering local economies imposes no cost on consumers in the national economy.

Finally, financing policies for business vary between the two models. Under the model of the managed economy, the systems of finance provide the existing companies with just liquidity for investment. Liquidity is seen as a homogeneous input factor. The model of the entrepreneurial economy requires a system of finance that is different from that in the model of the managed economy.[8] In the model of the managed economy, there is certainty in outputs as well as inputs. There is a strong connection between banks and firms in their joint efforts to foster growth. In the entrepreneurial economy model, certainty has given way to uncertainty requiring different financial institutions. In particular the venture and informal capital markets, providing finance for high-risk and innovative new firms, play an important role in the model of the entrepreneurial economy. In this model liquidity loses its homogeneous image and is often coupled with forms of advice, knowledge, and changing levels of involvement (business angels, incubators, et cetera).

6. Conclusion

The model of the managed economy dominated most economies until the late 1980s. It is based on relative certainty in inputs and outputs. Large plants and the ingenious interplay between man and machine are the cornerstones of this economy. Economies of scale increase dramatically: the long-term average cost curve is significantly downward sloping. The model of the managed economy brought unprecedented growth. The joint effect of the computer and telecommunications revolutions and globalisation has reduced the ability of the managed

economies of Western Europe and North America to grow and create jobs. On the one hand there is the advent of new competition from low-cost, but relatively high educated and skill-intensive, countries in Central and Eastern Europe as well as in Asia. On the other hand, the telecommunications and computer revolutions have drastically reduced the cost of shifting, not just capital, but also information out of the high-cost locations of Europe and into lower-cost locations (Audretsch and Thurik, 2001b). Taken together, this joint effect implies that economic activity in high-cost locations is no longer compatible with routinized tasks. Rather, the competitive advantage of high-cost locations shifted to knowledge-based activities, and in particular intellectual search activities. These activities cannot be costlessly transferred around the globe. Knowledge as an input into economic activity is inherently different from land, labour, and capital. It is characterized by high uncertainty, high asymmetries across people, and high transaction costs. An economy where knowledge is the main source of competitive advantage is more consistent with the model of the entrepreneurial economy. The essence of the model of the entrepreneurial economy is not just creating knowledge, but also exploiting it.

The joint effect of the computer and telecommunications revolution and globalisation not only changed the fundaments of modern economies. The entire society changed (Audretsch, 2007a). The corporatist model, which went very well together with the managed organisation of the economy, is not sustainable in an era where globalisation and entrepreneurship are major drivers. The many influential players of the globalised world and many unorganised players of the entrepreneurial sectors have outpaced the virtues of the checks and balances of the corporate model.

I do not want to argue that the managed economy is totally obsolete. There are large parts of the modern economy where routinized production is essential or where closed forms of innovation are successful. There are large parts where exploitation of what exists is important and where exploration of what does not exist is irrelevant. The modern economy is an economy of which the constellation differs drastically from that of twenty years ago. There is much to describe and to discover about the fundamental changes of the last twenty years. Furthermore, there is a great deal to discover about what good policy practices are under the model of the entrepreneurial economy (Audretsch, Grilo and Thurik, 2007). It seems obvious what the optimal use is of a machine, a running belt, or an entire factory in the managed economy. But it is unclear what the value is of ideas and knowledge with its many soft and latent aspects such as creativity, communication, and emotions. I hope that the above fourteen characteristics with their emphasis on the role of entrepreneurship capital may be helpful understanding the modern economy.

[8] The role of liquidity constraints should not be exaggerated in the entrepreneurial economy (Grilo and Thurik, 2008).

7. References

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