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Capitalism and democracy in the 21st Century: from the managed to the entrepreneurial economy*

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Abstract. This paper explains how and why the developed countries are undergoing a fundamental shift away from a managed economy and towards an entrepreneurial economy. This shift is shaping the development of western capitalism and has triggered a shift in government policies away from constraining the freedom of business to contract through regulation, public ownership and antitrust towards a new set of enabling policies which foster the creation and commercialization of new knowledge. The empirical evidence from a cross-section of countries over time suggests that those countries that have experienced a greater shift from the managed to the entrepreneurial economy have had lower levels of unemployment.

Key words: Entrepreneurship – Knowledge – Growth – Schumpeter – Unemployment

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1 Introduction

Joseph Schumpeter oscillated in his view about the type of economic system that was most conducive to growth. In his 1911 treatise, Schumpeter argued that a more decentralized and turbulent industry structure where the process of creative destruction was triggered by vigorous entrepreneurial activity was the engine of economic growth. But by 1942 Schumpeter had modified his theory, arguing instead that a more centralized and stable industry structure was more conducive to growth. According to Schumpeter (1942, p. 132), under the managed economy there was little room for entrepreneurship because, "Innovation itself is being reduced to routine. Technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required to make it work in predictable ways" (p. 132). Schumpeter (1942) reversed his earlier view by arguing that the integration of knowledge creation and appropriation bestowed an inherent innovative advantage upon giant corporations, "Since capitalist enterprise, by its very achievements, tends to automize progress, we conclude that it tends to make itself superfluous – to break to pieces under the pressure of its own success. The perfectly bureaucratic giant industrial unit not only outsets the small- or medium-sized firm and expropriates its owners, but in the end it also ousts the entrepreneur and expropriates the bourgeoisie as a class which in the process stands to lose not only its income but also, what is infinitely more important, its function." This later interpretation by Schumpeter anticipated the emergence of the managed economy of the post-war period.

The purpose of this paper is to explain how and why the developed countries are undergoing a fundamental shift away from a managed economy and towards an entrepreneurial economy. The managed economy of the post-war era performed marvellously for over three decades, providing the engine of jobs, growth, stability and security.[1] It is not a coincidence that the end of the Cold War ushered in a new economic era. The second section of this paper explains how the fall of the Berlin Wall helped triggered a wave of new participants in the global economy, spanning from Eastern and Central Europe to Southeast Asia. Combined with the communications revolution, this globalization led to the demise of the comparative advantage of Europe in many of the traditional industries, such as machine tools, metalworking, textiles and automobile production. The twin forces of globalization and the information revolution have made it difficult to maintain jobs in high-cost locations. This has created the rather gloomy perception of a policy dilemma that is being debated throughout Europe. The perceived tradeoff between wages and employment seems to demand that European countries choose between more jobs but at a cost of a lower standard of living, or higher wages, but at the sacrifice of fewer jobs. The third section of this paper argues that this perceived policy tradeoff between employment and wages is not at all inevitable. The comparative advantage of much of Europe is shifting towards knowledge-

[1] See Audretsch and Thurik (1997) and Wennekers and Thurik (1999).

based economic activity. Because economic activity based on new ideas and new ways of doing things cannot be easily transferred or emulated in low-cost locations, jobs lost due to corporate downsizing can be replaced with even better jobs.[2]

The fourth section explains how entrepreneurship is a fundamental characteristic of knowledge-based economic activity.[3] This is because the potential value of new ideas and knowledge are inherently uncertain. The existing firms will not pursue many new ideas because they have different agendas or simply do not recognize their potential value. If a new firm is not started to pursue such ideas they will simply remain untapped. Thus, the industrial structure of a knowledge-based entrepreneurial economy is very different from one based on the mass-production of relatively known products using established processes. It is a much more fluid and turbulent economy, where people are quick to move into situations where their ideas are valued. It is an economy where failure looses much of its pejorative connotation, because it is recognized that trial and error and experimentation are essential to innovation and the creation of new ideas.

In the fifth section of the paper we present an empirical analysis examining whether the rise in the number of entrepreneurs per labor force leads to lower levels of unemployment. We use data material of 23 OECD countries including EU-15, Japan and US for the period 1974 through 1994. We find that those countries that have introduced a greater element of entrepreneurship in the decade preceding 1984 have been rewarded with a greater decrease of unemployment in the subsequent decade. Section six is devoted to discussing some policy implications. In particular, a fundamental shift in the role of government towards business is taking place. The traditional stance of constraining the freedom of firms to contract, in the form of government regulations, public ownership and antitrust, is being replaced by a new set of enabling policies, where the emphasis is on the creation and commercialization of new knowledge.

2 The economic challenge of the 1990s

When the Berlin Wall fell in 1989 many people expected a dramatic reduction of the economic burden in both the West and the East that had been imposed by four decades of Cold War. Substantial unemployment and general economic stagnation did not disappear during the subsequent eight years. Unemployment and moderate growth are the twin economic problems confronting Europe. The number of unemployed in the European Union is twice as high as that in Japan and the U.S. together. Over 11

[2] Thurik (1996) and Carree and Thurik (1999) show that the benefits are directly related to the degree to which a country or industry has shifted economic activity away from large corporations and towards small firms. See also OECD (1996b).

[3] See Brock and Evans (1989), Loveman and Sengenberger (1991) and Carree (1997, chapter 2).

percent of the work force in the European Union was unemployed in 1996, ranging from about 3 percent in Luxembourg and about 4 percent in Austria and to 15 percent in Finland and over 20 percent in Spain.[4] Germany has experienced the highest rates of unemployment since World War II.

Perhaps most revealing, in countries like the Netherlands and the United Kingdom which have managed to reverse the upward trend in unemployment, job creation and quality of jobs have ranked among the most prominent subjects of political debate. Not only was employment creation the number one topic in the recent elections in France and Germany, but it was also the focus of debate during the 1996 American presidential election and 1997 national elections in the United Kingdom.

The policy debate throughout Europe and in other OECD countries about how to solve the chronic unemployment problem has revolved around a perceived tradeoff between higher wage levels but higher rates of unemployment on the one hand, or less unemployment but lower wages on the other. This debate has resulted in a caricature of the "Anglo-American" solution of more jobs through lower wages and the "European tradition" of higher wages, but at a cost of less employment. It certainly is true that the American and British economies have generated millions of new jobs, thereby reducing unemployment, and that at the same time, the mean real wage levels have risen the least. It is also true that these countries have experienced a considerable dismantling of social services provided by the government. This leaves policy makers with an apparent uncomfortable choice – either reduce wages and the social safety net to generate more employment, or else accept an upward spiral of unemployment in order to maintain the European standards concerning wages and the social safety net. The fifth annual report of the *European Observatory for SMEs* (p. 131) characterizes this tradeoff as, "The stagnation of employment since 1970 in the EU as opposed to the employment growth in the U.S. could, at least partially, be explained by the fact that real wages increased significantly in the EU while in the U.S. it only increased slightly."

This perceived policy trade-off between wages and unemployment is an illusion. The Dutch example shows that it is possible to achieve rising employment while maintaining an adequate social safety net. The key to breaking out of the perceived tradeoff between wages and jobs is to understand how the twin forces of globalization combined with the communications revolution has fundamentally shifted the comparative advantage of the leading European economies.

3 The emergence of the knowledge-based economy

The Cold War combined with internal political instability rendered potential investments in Eastern Europe and much of the developing world as risky and impractical. During the post-war era most trade and economic

[4] OECD (1997), standardized rates.

investment was generally confined to Europe and North America, and later a few of the Asian countries, principally Japan and the Asian Tigers. The comparative advantage was generally attained through large-scale production, which facilitated low-cost production through exploiting scale economies. Large-scale mass production was essential to gaining the comparative advantage. The relatively small domestic markets in most European countries seemed to pose a serious threat to European post-war competitiveness. However, they quickly developed two strategies to compensate for their small domestic markets. The first strategy was to internationalize by developing markets outside of the domestic market. The second was to rely on skilled labor and high levels of human capital to produce products that, although they might cost more, were of superior quality. Large transnational corporations thrived on this dual strategy basing the comparative advantage on large-scale production made possible by superior management and organization combined with high-skilled labor. By and large, the comparative advantage of Europe lies in large-scale production of moderate-technology products in traditional industries, such as machine tools, automobile parts, metalworking, chemicals and the food industry (Audretsch and Thurik, 1997).

This comparative advantage has been lost in the high-cost countries of Europe and North America in the last decade for two reasons. The first has to do with globalization, or the advent of competition from not just the emerging economies in Southeast Asia but also from the transforming economies of Central and Eastern Europe. The production costs, and in particular labor costs, are considerably lower in these countries. At the same time, the potential labor force of about 500 million in China and 350 million in India will put a pressure on any upward lift of the wage rate. While the uncertainties of the Cold War and internal political instabilities rendered transnational activities too risky during the first four post-war decades, this is less the case today.

The second factor triggering the loss of the traditional comparative advantage in Europe has been the communications revolution. The new communications technologies have triggered a virtual spatial revolution in terms of the geography of production.[5] The (marginal) cost of transforming information across geographic space has been rendered to virtually nothing. Confronted with lower cost competition in foreign locations, producers in the high-cost countries have three options apart from doing nothing and losing global market share: (1) reduce wages and other production costs sufficiently to compete with the low-cost foreign producers, (2) substitute equipment and technology for labor to increase productivity, and (3) shift production out of the high-cost location and into the low-cost location.

Many of the European and American firms that have successfully restructured resorted to the last two alternatives. Substituting capital and

[5] According to *The Economist*, "The death of distance as a determinant of the cost of communications will probably be the single most important economic force shaping society in the first half of the next century." "The Death of Distance," *The Economist*, 30 September, 1995.

technology for labor, along with shifting production to lower-cost locations has resulted in waves of *Corporate Downsizing* throughout Europe and North America. At the same time, it has generally preserved the viability of many of the large corporations. As record levels of both European and American stock indexes indicate, the companies have not generally suffered.

Corporate downsizing triggered by the shifting comparative advantage as a result of globalization has not been restricted to just a few countries such as Sweden and Germany. Rather, the response to globalization has led large corporations to downsize throughout the OECD countries.[6] For example, between 1979 and 1995 more than 43 million jobs were lost in the United States as a result of corporate downsizing.[7] This includes 24.8 million blue-collar jobs and 18.7 million white-collar jobs. Similarly, the 500 largest U.S. manufacturing corporations cut 4.7 million jobs between 1980 and 1993, or one quarter of their work force.[8] Perhaps most disconcerting, the rate of corporate downsizing has apparently increased over time in the United States, even as the unemployment rate has fallen. During most of the 1980s, about one in 25 workers lost a job. In the 1990s this has risen to one in 20 workers.

This wave of corporate downsizing has triggered cries of betrayal and lack of social conscience on the part of the large corporations.[9] But it is a mistake to blame the corporations for this wave of downsizing that has triggered massive job losses and rising unemployment in so many countries. These corporations are simply trying to survive in an economy of global competitors who have access to lower cost inputs.

There is, however, an alternative. It does not require sacrificing wages to create new jobs, nor does it require fewer jobs to maintain wage levels and the social safety net. This alternative involves shifting economic activity out of the traditional industries where the high-cost countries of Europe and North America have lost the comparative advantage and into those industries where the comparative advantage is compatible with both high wages and high levels of employment – knowledge based economic activity.

The emergence of high-technology regions, such as Silicon Valley in California, Research Triangle in North Carolina, and Cambridge in the United Kingdom may seem surprising and even paradoxical in a world increasingly dominated by e-mail, fax machines, and cyberspace, which should have rendered the importance of geographic proximity to be irrelevant. The resolution of this paradox lies in *a crucial distinction between knowledge and information*. Information consists of facts, such as the price

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[6] "Big is Back," *The Economist*, 22 June, 1995 and "The Year Downsizing Grew Up," *The Economist*, 21 December 1996.

[7] "The Downsizing of America," *New York Times*, 3 March, 1996, p. 1.

[8] See Audretsch (1995).

[9] As the German newspaper *Die Zeit* (2 February, 1996, p. 1) pointed out in a front page article, "When Profits Lead to Ruin – More Profits and More Unemployment: Where is the Social Responsibility of the Firms?" the German public has responded to the recent waves of corporate downsizing with accusations that corporate Germany is no longer fulfilling its share of the social contract.

of gold in Tokyo, or the weather in New York, and can be costlessly transmitted around the globe. By contrast, knowledge consists of ideas that are subjective, uncertain and difficult to explicitly write down. Many of these ideas arise as a result of face-to-face contact and interchange. Many of the most creative ideas have been the result of chance meetings at a social event or an industry function.

Economic activity based on ideas and new knowledge cannot be easily copied by competitors located outside of the source and cannot be easily transferred to lower-cost countries by multinational corporations (Audretsch and Feldmnan, 1996; Audretsch and Stephan, 1996). While the processes and organizational methods required to produce automobiles can be transferred from Stuttgart to, say, Hungary, it is not so easy to transfer innovative work in biotechnology around the globe.[10] Economic activity based on new ideas, such as fashion in Milan, culinary arts in Paris, and movies in Hollywood have remained geographically concentrated. Higher wages can be maintained for economic activity that is based on new ideas. The emerging source of comparative advantage for Europe is economic activity based on creativity and new ideas.[11]

The global demand for products in emerging knowledge-based industries is high and growing rapidly; yet the number of workers who can contribute to producing and commercializing new knowledge is limited to just a few areas in the world. Economic activity based on skills that can be found throughout large parts of the world is doomed to generate lower wage rates as a result of global competition. By contrast, economic activity based on new knowledge will generate higher wages and greater employment opportunities reflecting the exploding demand for new and improved products and services.

There are many indicators reflecting the shift in the comparative advantage of the high-wage countries towards an increased importance knowledge-based economic activity. For example, Kortum and Lerner (1997, p. 1) point to "the unprecedented recent jump in patenting in the United States," as evidenced by the rise in applications for U.S. patents by American inventors since 1985, which exceeds the increase in any other decade in this century. Throughout this century, patent applications fluctuated within a band of between 40,000–80,000 per year. By contrast, in 1995 there were over 120,000 patent applications. Similarly, Berman, Bound and Machin (1997) have shown that the demand for less skilled workers has decreased dramatically throughout the OECD, while at the same time the demand for skilled workers has exploded. See also OECD (1996a) where a discrimination is made between forms of knowledge.

Why has it proven so difficult to shift economic activity out of the traditional industries where the products are now fairly standardized and

[10] As *Fortune* points out, "Business is a social activity, and you have to be where important work is taking place." "The Best Cities for Knowledge Workers," *Fortune*, 15 November, 1993, pp. 44–57.

[11] For a compelling statement of the importance of knowledge to the competitiveness of Europe, see the statement by Martin Bangemann in Dumort and Dryden (1997).

where production can be easily transferred out of high-cost locations?[12] The great established companies of Europe and North America have what is called their core competence in traditional products. They have limited capacity for shifting their activity out of these traditional industries and into new industries.

Part of this inability to shift into new knowledge-based industries is that large corporations excelled in an economy where it was more or less known what was to be produced and how to produce it. The large corporations excelled at bringing together the essential inputs of machinery, workers, and natural resources to generate manufactured products. Knowledge is a qualitatively different input in the production process than machinery or workers who serve as cogs in an assembly line (Audretsch and Thurik, 1997). While a consensus can arise about the contribution of a worker in an assembly line process, no such consensus exists for new ideas which workers have. New ideas are inherently uncertain. What one worker thinks is a good idea may be disputed by colleagues and bosses. Therefore, the ability of people to move into new situations to create and try out new ideas rejected elsewhere is fundamental in a knowledge-based economy. Sometimes such new opportunities to try out new ideas can be found within existing firms. But often people with new ideas find that, because of the fundamental uncertainty, starting a new firm is the only way in which the idea can be pursued and commercialized. What might be termed, as the entrepreneurial society is conducive to innovative activity because it encourages people to create new ideas and to actively commercialize those ideas.

4 The entrepreneurial society

An economy whose comparative advantage is new knowledge requires a very different industrial structure as well as economic values. People who can create new ideas and implement them become highly valued. New products and new firms generate large increases in employment where the global demand is virtually untapped but the supply of workers able to produce such innovative products is limited. Of course, the degree of uncertainty inherent in new knowledge dictates that many of the new ideas, and therefore new firms, will not, in fact, prove to be viable or successful. Those firms and workers must abandon such attempts and move on. Thus, the knowledge-based economy is in motion and is characterized by a high degree of people starting new firms to pursue, explore or implement new ideas. Those new firms that prove to be viable grow rapidly and expand employment. Those based on an idea that is not viable stagnate and may

[12] What *Der Spiegel* concludes for Germany is equally valid for much of Europe, "Global structural change has had an impact that only a short time ago would have been unimaginable. Many of the products, such as automobiles, machinery, chemicals and steel are no longer competitive in global markets. And in the industries of the future, like biotechnology and electronics, the German companies are barely participating." *Der Spiegel*, number 5, 1994, 82–83.

ultimately exit. What appears to be a turbulent and wasteful economy is actually the process by which new ideas are generated and explored, ultimately creating new high-paying jobs to replace those lost due to downsizing.

The American industrial landscape has been transformed in a relatively short period of time from a static and rigid economy dominated by corporate dinosaurs such as IBM, U.S. Steel, and RCA to an economy in full motion where new firms are generating not just most of the new jobs, but also the new industries. In the 1950s and 1960s it took two decades for one-third of the 500 largest corporations in America to be replaced. In the 1970s it took the entire decade to replace one-third of the 500 largest corporations. By contrast, in the 1980s, it took just five years.[13] Perhaps even more impressive than the handful of new enterprises that grow to penetrate the elite club of corporate giants are the armies of startups that come into existence each year – and typically disappear into oblivion within a few years. In the 1990s there are around 1.3 million new companies started each year in the United States.[14] The knowledge-economy is characterized by a high degree of turbulence. It is an economy in motion, with a massive number of new firms entering each year, but only a subset surviving for any length of time, and an even smaller subset, such as Microsoft and Intel, that ultimately become the new corporate giants.

Some of this turbulence is attributable to new firms started in desperation to avoid (the threat of) unemployment resulting from corporate downsizing. The decision to become self-employed is often a response to impending unemployment and does not have a high likelihood of success (Storey, 1991). But on balance, this motion shifts the economy out of the old traditional sectors, where neither employment maintenance nor high wages are compatible with the comparative advantage, and into new industries based on new knowledge. In the 1950s and 1960s the most important industries in the United States were steel and automobiles, along with other heavy manufacturing industries. In the present decade information technology has emerged as the largest U.S. industry. Information technology, which includes computing and communications, has grown by 57 percent during the 1990s, to $866 billion.[15] In 1996 4.3 million workers were employed in information technology, at a mean wage level of 73 percent higher than that in the private sector.

Large corporations have been downsizing employment in order to maintain competitiveness. By contrast, it has been new firms in new industries that have created jobs.[16] For example, small firms between 1976

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[13] Audretsch (1995). For evidence documenting the increase in job mobility across a broad spectrum of countries see Davis, Haltiwanger, and Schuh (1996a, b) and Broersma and Gautier (1997).

[14] Cited from the *United States State of Small Business*, 1997.

[15] United States Commerce, Cybernation: The Importance of the High-Technology Industry to the American Economy," Washington: U.S. Government Printing Office, 1997.

[16] The literature on job generation and firm size can be found in Davis, Haltiwanger and Schuh (1996a, b) and Carree and Klomp (1996).

and 1986 created 1.3 million new jobs in U.S. manufacturing, while the number of large manufacturing jobs actually decreased by 100,000.[17] Subsequently, between 1987 and 1992, small companies (with fewer than 500 employees) created 5.8 million new jobs in the United States. Over that same period, large companies recorded a net loss of 2.3 million jobs. Between 1980 and 1993 the 500 largest U.S. manufacturing corporations, or the Fortune 500, cut 4.7 million jobs, or one quarter of their work force. Most recently, between 1990 and 1995, firms with fewer than twenty employees experienced a 17.68 percent increase in employment, while firms with at least 500 employees experienced an increase in employment of 4.79 percent (Acs and Armington, 1998). This difference in job generation was even more pronounced in manufacturing, where employment grew by 21.25 percent in firms with fewer than 20 employees and decreased by 8.47 percent in firms with at least 500 employees.[18] The contribution of small and new firms to job generation has not escaped the attention of policy makers in the United States[19] or Europe (*European Observatory*, 1997).

The propensity for new and small firms to create the bulk of jobs is not restricted to the United States. Konings (1995) found that for the United Kingdom there is a negative relationship between job creation and plant size and a positive relationship between gross job destruction and plant size. This means that small firms are creating the bulk of new jobs in the United Kingdom (Hughes, 1993). Robson and Gallagher (1994) show that about one-third of all new employment in the United Kingdom between 1971 and 1981 was in firms with fewer than twenty employees. In the 1980s nearly one-half of all jobs were created in such small and new firms. Between 1987 and 1991 large firms in the United Kingdom were net job shedders. Small firms contributed most new employment. Hughes (1993) provides evidence suggesting that this was in part due to downsizing of the largest firms in the economy, and in part due to an actual expansion of economic activity contributed by small firms. Baldwin and Picot (1995) have found virtually identical results for Canada.[20]

A study undertaken by the EIM (Bais, Bangma and Verhoeven, 1997) found that there were 768,000 jobs lost in the Netherlands between 1990 and 1994.[21] The reason that unemployment did not drastically increase during this decade is that these job losses were more than offset by the

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[17] Audretsch (1995).

[18] These job creation statistics are from the Longitudinal Establishment and Enterprise (LEEM) file of the Bureau of the Census, Department of Commerce and are calculated using the base year method. This is explained in more detail in Acs and Armington (1998).

[19] Susan Dentzer in *U.S. News and World Report* (16 August, 1993) reports that "What do Bill Clinton, George Bush and Bob Dole have in common? All have uttered one of the most enduring homilies in American political discourse: That small businesses create most of the nation's jobs."

[20] Most studies cited her deal with the manufacturing sector. Klomp and Thurik (1998) deal with very small Dutch hospitality and retail firms. They find that small firms do not outperform their larger counterparts with respect to net job creation.

[21] Taken from Table 38 (p. 84) and Figure 5 (p. 86) of Bais, Bangma and Verhoeven

creation of 973,000 new jobs, of which 44 percent came from existing establishments and 56 percent from new establishments. At the same time, new firms were responsible for only 15 percent of the job losses. Thus, new firms in the Netherlands have largely provided the net job growth of 205,000 new jobs.

As a study by Wagner (1995) shows, Germany is apparently one of the only developed industrialized countries where net job creation is not systematically and negatively related to firm size. Wagner finds that while gross job creation and destruction rates tend to decline with firm size in Germany, net job creation rates and firm size are not systematically related. However, with the exception of Germany, these two stylized facts appear to be remarkably robust – small firms have created most of the new jobs in Europe and North America.

One concern about the job creation contributed by small and new firms is that they are associated with lower wages. Some critics hold the shift towards increased entrepreneurial activity as responsible for the increased gap in incomes. The discussion above suggests that entrepreneurship can be a response to impending unemployment as well as to perceived opportunities to pursue innovative ideas. The first type of entrepreneurship tends to generate marginal firms with a low likelihood of survival and lower wages, while the second type of entrepreneurship creates new opportunities and higher wages. The standard of living generated by entrepreneurial activity will generally reflect the education and training of the individuals involved. Untrained, uneducated workers with low skill workers may be able to start new firms, but rarely the kind of firm generating stable jobs and higher wages. Virtually every western country has experienced a widening gap in the income distribution during the last decade (Houseman, 1995). But it is important to remember that entrepreneurship is not the cause of this increased gap in the income distribution. Rather, it reflects the response of individuals to the twin forces underlying the shifting comparative advantage in high-wage countries – globalization and technology.[22] The real policy issue therefore is not whether a society will become more entrepreneurial, but rather which of the two types of entrepreneurship will prevail. The policy challenge will be how to provide access to knowledge and skills for all workers, and an environment enabling them to fully utilize those abilities.

Examples of both types of entrepreneurship, even within the same country, abound. For example, by shifting economic activity to new industries, generated largely by entrepreneurial activity, Silicon Valley in California has managed to break out of the apparent tradeoff between wages and jobs presented in mature industries. The Silicon Valley mean income is 50 percent higher than that for the rest of the country. The higher standard of living has not come at the price of a reduction in employment. Employment has increased by 15,000 jobs, or 15 percent between 1992 and

[22] Clearly, the lowering of the level of taxes and that of social security benefits also plays a role.

1996 in Silicon Valley.[23] In the entrepreneurial economy there is no tradeoff between high wages and employment growth. It is possible to have both, at least in those sectors where economic activity is based on new knowledge. By contrast, self-employment in the rural areas of New England and Appalachia, which are based largely on handwork and crafts, as well as many small firms in the rural South, which are based on traditional mature industries such as textiles, have been able to maintain employment only at the cost of falling real wages.

There is a large body of consistent empirical evidence linking the size of a firm to wages. This is important because the main vehicle for entrepre5-neurship is the new and small firm. Virtually every study covering a broad spectrum of time periods and OECD countries has found a positive relationship between firm size and wages.[24] However, the apparent trade-off between wages and firm size is the result of static, cross-section studies taken at a single point in time. A different picture emerges when a dynamic analysis is introduced. This dynamic analysis suggests that people start firms to pursue new but uncertain ideas. The only way they can discover if these new ideas are viable is thorough the trial-and-error experience provided by the market (Jovanovic, 1982). They subsequently learn, or discover, through experience, whether or not the idea is viable. If it is viable, the firm will survive and grow. If it is not viable, the firm stagnates and ultimately exits. An important line of research, spanning a broad spectrum of time periods and countries, supports this dynamic view of industries (Geroski, 1995). In addition, there is systematic evidence that negative relationships exist between firm age and growth, and firm size and growth, as well as positive relationships between firm size and the likelihood of survival, and firm age and the likelihood of survival (Geroski, 1995). This evidence supports the dynamic view of industries where people start firms to experiment with new ideas. Many of these new experiments fail, but some succeed, resulting in low survival rates but high growth rates of the successful new startups.

A different line of research, based on longitudinal data sets, shows that the wages and productivity of new firms increase as the firm ages (Baily, Bartelsman and Haltiwanger, 1996). Taken together, these two lines of research imply that, as new firms mature, some of the small low wage firms of today become the high wage firms of tomorrow. Similarly, some of the small low productivity firms of today become the high productivity firms of tomorrow (Baily, Bartelsman and Haltiwanger, 1996). Through growth new firms generate not just greater employment but also higher wages. The growth of new firms ensures that the greater employment does not come at a cost of lower wages but rather the opposite – higher wages.

The cross-section tradeoff between firm size and wages emerged for two reasons. First, the composition of small firms includes many enterprises that will ultimately fail. Stagnant small enterprises with no growth prospects

[23] "The Valley of Money's Delights," *The Economist*, 29 March 1997, special section, p. 1.

[24] The most cited study is that of Brown, Hamilton and Medoff (1990). See also Oosterbeek and Van Praag (1995).

typically provide low wages. Their inclusion pulls down the mean wage of small firms. Second, the higher growth rates of surviving small firms result in subsequent higher rates of productivity and wages.

5 Empirical results

As we have seen above there are many consequences of the shift from a managed economy to the entrepreneurial one. The most important question is whether, at the end of the day, the entrepreneurial economy leads to less unemployment than the managed one. We present some calculations as to whether a rise in the number of entrepreneurs, i.e., self-employed per labor force, leads to lower levels of unemployment. We use data material of 23 OECD countries including the fifteen countries of the EU-15, Iceland, Norway, Switzerland, Canada, Australia, New Zealand, Japan and US for the period 1974 through 1994. We estimate the following equation:

$$U_{94} - U_{84} = \alpha + \beta(E_{84} - E_{74}) + \gamma(U_{84} - U_{74}) \ ,$$

where U_t is the standardized number of unemployed per labor force in year t and where E_t is the number of entrepreneurs per labor force in year t. Unemployment data are from OECD (*Historical Statistics 1960–1990* and *1960–1993* and *Main Economic Indicators*), standardized is according to the *13th Conference of Labor Statistics* and entrepreneurs is from the *OECD Labor Force Statistics 1974–94* and the *Eurostat Labor Force Survey* and worked upon by EIM (1997). Long ten-year intervals are applied because a change in the number of entrepreneurs is assumed to have an influence only after a considerable period. Startup firms do not contribute to bringing down unemployment. Usually they are very small and a large number of them do not survive for more than five years. The surviving successful ones generate employment in a later phase. Our equation also includes lagged unemployment growth in order to correct for the autocorrelation of unemployment growth over time. Moreover, the change in the level of unemployment will probably affect the propensity of people to start firms. This ''refuge'' principle occurs most notably in periods of downturns in the business cycle. If the change in the number of unemployed is high (low) the lagged change in this number may also be high (low) due to autocorrelation. If $U_{84} - U_{74}$ is left out of the regression equation, coefficient β might become positive because of this cyclical effect. This has nothing to do with the structural effect of the rate of entrepreneurship shift influencing unemployment growth we are looking for.[25] That is why lagged unemployment growth is used in the regression equation and γ can be interpreted as the 'mean' degree of autocorrelation of unemployment growth in the 23 OECD countries.

Weighting with the number of entrepreneurs (in thousands) straightforward OLS regression yields a value of −.008 (−2.2) of α, a value of −.76 (−2.8) of β and a value of .26 (3.2) of γ. The t-statistics are between pa-

[25] See Granger (1969).

rentheses. Our main conclusion is that growth in the number of entrepreneurs leads to reduction in the rate of unemployment. Also, there appears to be a moderate autocorrelation of the rate of unemployment, since γ is in excess of zero. The negative value of the intercept is a representation of the general decline in the rate of unemployment in the period 1984 through 1994 in the 23 countries. This decline is greater if the rate of entrepreneurship increased in the preceding decade and it is moderated if unemployment increased in the preceding decade.

The other coefficients are not affected if either β or γ is set equal to zero. This implies that the "chicken and egg" effect of the "refugee" principle would not have distorted our results.

An important qualification to our results is that the data of the number of entrepreneurs across different countries are always difficult to compare since practically every country uses specific definitions. Also, they include a number of estimates. Lastly, there are many determinants of unemployment not taken into account in our analysis, which are not covered by the inclusion of effect of autocorrelation. Follow-up studies are required for corroboration of our results.[26] Still, the effect of the growth rate of entrepreneurship is found to have a negative effect on the growth rate of unemployment in the period 1994 through 1974 for 23 OECD countries. We have to conclude that, based on the findings of this exercise, there is at least some evidence suggesting that entrepreneurship contributes to the creation of new jobs and the reduction in unemployment.[27]

6 Policy implications

When the comparative advantage of a nation is based upon existing products targeting specific industries and even firms for support or promotion can be effective. Targeting specific firms in selected industries was clearly a successful policy for Japan in the post-war period and helped the Japanese achieve the comparative advantage in industries such as automobiles and electronics. Targeting outputs has also had a long tradition in Europe. As a response to *The American Challenge* in the form of "the dynamism, organization, innovation, and boldness that characterize the giant American corporations," Servan-Schreiber (1968, p. 153) prescribed an industrial policy that would undertake "the creation of large industrial units which are able both in size and management to compete with the American giants."

[26] Carree and Thurik (1999) provide an analysis showing the consequence of lagging behind in the restructuring process from large to smaller firms in manufacturing. Using a sample of 14 manufacturing industries in 13 European countries they find that, on average, the employment share of large firms in 1990 has a negative effect on growth of output in the subsequent four-year period.

[27] Complementary evidence, though not dealing with unemployment, is provided by Schmitz (1989). Schmitz presents a theoretical endogenous growth model which relates entrepreneurial activity and economic growth. He shows that an increase of the proportion of entrepreneurs in the working force leads to an increase in long-run economic growth.

Because giant corporations were thought to be needed to amass the requisite R&D resources for innovation, Servan-Schreiber (1968, p. 159) argued that "The first problem of an industrial policy for Europe consists in choosing 50 to 100 firms which, once they are large enough, would be the most likely to become world leaders of modern technology in their fields." This industrial policy prescription of targeting outputs and outcomes is echoed in the 1988 Cecchini Report to the Commission of the European Union, where the anticipated gains from European integration are measured in terms of reduced costs achieved through increases in scale economies.

How appropriate is an industrial policy of targeting outputs and outcomes in the knowledge-based economy? One has to wonder what would have happened to the United States computer and semiconductor industries had IBM been selected as a national interest around 1980 and promoted through favorable treatment as well as protected from threats like Apple Computer, Microsoft, and Intel. Would the United States have been able to shift so much economic activity and new jobs into the emerging software and semiconductor industries? While the proclamation, "What is good for General Motors is good for America" may have been sensible three decades ago, it no longer holds in the entrepreneurial knowledge-based economy.

The entrepreneurial economy is based less on the traditional inputs of natural resources, labor and capital, and more on the input of knowledge and ideas. It is no longer certain what products should be produced, how they should be produced, and by whom (Audretsch and Thurik, 1997). This increased degree of uncertainty increases the difficulty of selecting the correct outcomes and increases the likelihood that the wrong firm and industry will be targeted. Rather, the appropriate industrial policy in what Paul Krugman (1994) terms as The Age of Uncertainty is to target inputs, and in particular those inputs involved in the creation and commercialization of knowledge. Such policies involve basic and applied research at universities and research institutes, investments in the general level of education as well as advanced technical specialties, and the training and upgrading of the skill levels of workers. The entrepreneurial economy calls for polices that create an environment, or what the Germans call the *Rahmenbedingungen*, facilitating the creation and commercialization of knowledge.

When the comparative advantage is based on large corporations exploiting scale economies in production and R&D, the major public policy emphasis is constraining the market power of large corporation. On the one hand, the large corporation is essential for efficient production. But on the other hand, such a large concentration of economic assets poses a threat not just to the market process but even to democracy.[28] The resulting social partnership in virtually every developed country has involved unions, government and the large corporations. At the heart of this social partnership was constraining the power of large corporations.

In the knowledge-based entrepreneurial economy the relevant policy question shifts away from "How can governments constrain firms from

[28] Usually, this is referred to as the "anti trust dilemma".

abusing their market power?'' to ''How can governments create an environment fostering the success and viability of firms?'' The major issues in the entrepreneurial economy have shifted away from concerns about excess profits and abuses of market dominance to international competitiveness, growth and employment.

As the waves of small start-ups in knowledge-based industries demonstrate, the link between success and market power has been broken. The appropriate response for government policies is to shift away from constraining policies to policies of enabling and stimulation. Policies that channel finance to potential entrepreneurs who would like to try out new ideas are essential. The deficiency of venture capital and informal capital has impeded the restructuring of economic activities out of the traditional industries where Europe has a competitive disadvantage and into new knowledge-based industries that are compatible with both high employment and high wages. In 1994 only about five percent of European venture capital was allocated towards start-up companies. In the United States about 70 percent of venture capital is invested in high-technology startups, while only about 30 percent of venture capital in the Netherlands is devoted towards high-tech.[29] As a result, equity investment in small firms in new industries is slow to develop in Europe. Bright men and women with good ideas have a hard time finding start-up finance.[30]

Other policies include de-emphasizing penalties associated with new-firm failures, an increased flexibility of the labor force and increased access to research and development results undertaken at universities and national research institutes. The downsizing of the federal agencies charged with the regulation of business in the United States and Great Britain has been interpreted by many economists as the eclipse of government intervention. But to interpret deregulation and privatization as the end of industrial policy ignores an important shift in the locus and target of government industrial policy (Van Bergijk and Haffner, 1996). The last decade has seen the emergence of a set of enabling policy initiatives that fall outside of the jurisdiction of the traditional regulatory agencies. Sternberg (1996) shows how the success of a number of different high-technology clusters spanning a number of developed countries is the direct result of enabling policies.[31] This support has generally provided diversified technology development involving a mix of activities encompassing a broad spectrum of industrial

[29] Statistics provided by Sander Balje of the Netherlands Ministry of Economic Affairs.

[30] According to Helmuth Guembel, who is the research director of the Gartner Group in Munich, ''Put Bill Gates in Europe and it just wouldn't have worked out.'' ''German Innovation: No Bubbling Brook,'' *The Economist*, 10 September, 1994, pp.75–76.

[31] For example, the Advanced Research Program in Texas has provided support for basic research and the strengthening of the university infrastructure, which played a central role in developing a high-tech cluster around Austin (Feller, 1997). The Thomas Edison Centers in Ohio, the Advanced Technology Centers in New Jersey, and the Centers for Advanced Technology at Case Western Reserve University, Rutgers University and the University of Rochester have supported generic, precompetitive research.

collaborators spanning technology-intensive multinational corporations and new-firm startups.

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