The Economic and Social Review, Vol. 40, No. 3, Autumn, 2009, pp. 255–268

The Emergence of the Entrepreneurial Society* The 2008 Geary Lecture

DAVID B. AUDRETSCH**
Max Planck Institute, Germany

I INTRODUCTION

It is a real honour to be here in Ireland to celebrate the founding Director of the Institute, R.C. Geary. If I understand correctly, I am visiting on the second anniversary of the Institute's move into this building. It is a great pleasure to be able to share this occasion with you as well as to participate in a lecture series that has a long distinctive history of very interesting speakers. This is actually my first trip to Ireland. For years, I could not wait to get to Ireland to see and to experience this great economic boom, but I guess I should have come a few years sooner.

The topic of my talk today is what I term the entrepreneurial society or the emergence of the entrepreneurial society, which suggests that something has changed. The Director and I were speaking on the way here about the fall of the Berlin Wall which was nearly twenty years ago, in November 1989, shortly before we first met. A lot of euphoria followed not only because Germany was reuniting but because Europe was reuniting, and there was also the end of the Cold War. In this euphoria people expected an economic surge to follow, freed from the burden of supporting the Cold War military, but also the related

* This article is an edited version of the Geary Lecture delivered by Professor David B. Audretsch at The Economic and Social Research Institute in Dublin, on 13 November 2008.
** David B. Audretsch is the Director of the Max Planck Institute of Economics in Jena, Germany. He also serves as a Scholar-in-Residence at the Ewing Marion Kauffman Foundation. In addition, he is an Honorary Professor at the Friedrich Schiller University of Jena, Research Professor at Durham University, a Distinguished Professor and the Ameritech Chair of Economic Development and Director of the Institute for Development Strategies at Indiana University, an External Director of Research at the Kiel Institute for the World Economics, and is a Research Fellow of the Centre for Economic Policy Research (London).

social and political burden. However, we know the 1990s that followed were actually pretty tough – perhaps not for those of you here in Ireland – but all across the rest of Europe.

Since European economies did not prosper in the 1990s, it was not surprising that at the turn of the century Europe was making efforts to try to reignite growth and to generate employment. What was surprising, I think, was the completely new direction Europe took at the Council of Lisbon 2000: In the so-called Lisbon Strategy, the EU made a commitment not just to be the leader of knowledge in the West but also the leader in entrepreneurship. Romano Prodi, then President of the European Commission, said that the field of entrepreneurship needs to be taken seriously because "…there is mounting evidence that the key to economic growth and productivity improvements lies in the entrepreneurial capacity of an economy".

That was surprising, at least to me and, I suspect to many other economists I know. I had spent the 1970s studying economics at Bachelor's and Master's degree levels, without ever hearing anything about entrepreneurship. When public policymakers looked to ignite economic growth and generate employment they typically turned to large corporations. Charlie "Engine" Wilson, the Chairman of General Motors, declared "What's good for General Motors is good for America." The management scholar, Alfred Chandler provided meticulous empirical evidence confirming that economies of scale and scope generated higher levels of efficiency and productivity in the largest corporations.

Joseph Schumpeter, echoed this view, "Since capitalist enterprise, by its very achievements, tends to automise 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 ousts 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 in its income but also, what is infinitely more important, its function."

Similarly, John Kenneth Galbraith concluded that the entrepreneur "…is a diminishing figure…. Apart from access to capital, his principal qualifications were imagination, capacity for decision and courage in risking money, including, not infrequently, his own. None of these qualifications is especially important for organising intelligence or effective in competing with it." As Galbraith conceded, "power" has shifted from entrepreneurs to the large organisation, "So it is with organisation – organised competence – that the power now lies."

Countries with a deficiency of large corporations focused their development largely on attracting inward foreign direct investment. In fact, from

what I have read about the 1990s, a key component of Ireland's strategy to generate growth was to try to attract in more foreign direct investment. Certainly, in developing countries it was all about attracting physical capital first, with the expectation that growth and employment would follow.

My lecture today is based on a research agenda that I have been pursuing for some years. In essence the research tries to understand why policy throughout most of the OECD countries, regions, and cities – perhaps most strongly at regional and city levels – has been looking to entrepreneurship as the generator of economic growth. So the purpose of this lecture and the underlying research behind it, is to try to uncover what entrepreneurship has to do with economic growth. To do this, I am going to explain what we call the "Knowledge Spillover Theory of Entrepreneurship", which suggests that entrepreneurship is important because it serves as a key conduit for knowledge spillovers. Knowledge is created in one organisation, whether a large research corporation or laboratory. However, knowledge does not just 'appear' in new organisations, like manna from heaven as the Solow growth model implied. Rather it requires individuals to take that knowledge – removing it from the originating organisation and bringing it to another, or new, organisation and then commercialising it. Finally, not wishing to suggest what public policy should be, as that is probably too bold for me, I want to interpret what public policy seems to have been doing for some time now, for a decade at least, which is to treat entrepreneurship as a *bona fide* instrument of economic growth.

II A PUBLIC POLICY DILEMMA: EFFICIENCY VERSUS DECENTRALISED DECISION MAKING

An entire generation of scholars in the emerging field of Industrial Organisation identified the driving force of efficiency and productivity at firm and industry levels. They concluded, after developing theory and conducting empirical research, that economies of scale are important, which, in retrospect, is not especially surprising when you think about manufacturing industry, where physical capital matters. What this meant for public policy was that there seemed to be a trade-off between having the scale economics of concentrated industry and firms, on the one hand, as against the benefits of having decentralised decision makers on the other hand. In effect, it was seen as a trade-off between efficiency and democratic decentralised decision making.

What this meant for public policy was really how to live with the 'beast of big business': and different countries had different responses to this policy

quandary. Countries like Sweden and France favoured concentrated ownership of industries. In Sweden, Saab was owned by the government, as was Renault in France – to name just two governmental ownership examples. Other countries, such as Germany and the Netherlands, put heavy regulation in place to prevent private industry from abusing its market power. The United States had actually a lot of public ownership and strong regulation. In addition, America placed a strong reliance on antitrust policy, or what is referred to as competition policy in Europe.

What about entrepreneurship and entrepreneurship policy? Certainly the public policy debate focusing on economic growth and employment creation during the early post-World War II era, typically ignored entrepreneurship, or the idea of helping people start businesses. When the US Small Business Administration was established in 1952, the US Congress mandated that the Small Business Administration should protect and preserve small business. There was a clear sense that while small businesses were perceived as essentially inefficient, they were desirable for social or political reasons – keeping a kind of dispersed decision making intact but with an acknowledged high opportunity cost, in economic terms. That was essentially the role of entrepreneurship during the post-World War II era. But we know that globalisation put an end to the competitiveness of places based on physical capital. What we saw was the de-linking of the competitiveness of firms from the competitiveness of what Germans call "*der Standort*".

As shown in a study carried out for the German Ministry of Economics, employment at the top corporations in Germany changed after the Berlin Wall fell. At Volkswagen, total employment stayed the same, with employment outside of Germany increasing, while employment within Germany decreased. The company was doing fine – we know that its profits were fine. There were fewer employees in Germany and more employees outside of Germany due to what we now call offshoring, substituting technology for capital and employment in Germany. This pattern replicates itself throughout the auto sector and elsewhere. Overall, the German auto industry lost 161,000 jobs in Germany while creating 30,000 in other countries. If you look at examples in the chemical industry, say Hoechst, you can see that while total employment went down a little, employment increased outside of Germany, again leading to many fewer employees in Germany. For the whole sector, we see in the chemical industry a loss of 80,000 jobs in Germany, with 14,000 jobs added outside Germany. This is true for almost all of the largest German companies. While the companies and the industries generally were doing fine, because of globalisation German firms were creating jobs outside their national boundaries, and consequently Germany itself saw fewer manufacturing employees.

In effect, globalisation hit Germany relatively early. The same pattern followed in England, Sweden, and the US. I would not want to argue whether this adjustment pattern was good or bad, but rather to recognise that this was probably the inevitable impact of globalisation, and that it amounted to a very large change.

III IS INVESTING IN KNOWLEDGE THE DEVELOPMENT POLICY PANACEA?

Fortunately, economics had an answer to help policymakers to deal with this major change. The answer was to move away from the public policy focus on investing in physical capital towards recognition of the role of investing in knowledge. Paul Romer and a whole generation of scholars shifted to models of endogenous growth to focus on investment in knowledge. They recognised that while you can shift factories from high cost locations in Europe and North America to Central and Eastern Europe or Asia, it is a lot harder to shift ideas and idea creation. Face-to-face communication is critical for ideas and idea creation and you cannot just outsource that kind of creative process.

So in what was known as the 'endogenous growth model' or the 'new growth model', knowledge became the focus and it framed the policy debate. In this policy context about five or six years ago, I was invited to visit Stockholm. Sweden, like Germany and much of Europe but not Ireland had suffered from stagnant growth in the 1990s, with unemployment steadily increasing. So I was asked to discuss what should Sweden do in this context. As a kind of a born again growth theorist, I marched into Stockholm and I told the host, the Swedish Minister of Economics, exactly what Sweden should do: It needed to invest in knowledge, it needed to invest in R&D, it needed to invest in universities and invest in human capital, education, and so on. I remember our host very kindly assuring the audience that while the Professor must be correct, nobody will ever believe him because by all the measurements, Sweden was either number one or two in the world in terms of patents, in terms of R&D per capita, and in terms of university education. Further, the Pisa Studies on Pre-University Education showed Sweden to be way up at the top. So it is hard to know what Sweden should really be doing differently. It was there I first heard the phrase 'Swedish Paradox', which states that if investing in knowledge is so important, like the economists say it is, why is growth and employment creation so elusive in Sweden.

In Brussels, Romano Prodi, then President of the European Commission, noting that the problem was not just Swedish, but pan-European, renamed it the "European Paradox". Certainly, in Northern and Western Europe, if you start to think about knowledge, not in the narrow technical sense focused on

R&D, but in a broader sense, including cultural investment and travel, then I think the European investment in knowledge is incredibly impressive. However, despite these kinds of investments in knowledge, growth for most of Europe, if not all of Europe, has remained elusive.

IV THE KNOWLEDGE FILTER

Well, had European leaders looked across to the other side of the Atlantic, they would have discovered that they did not have a monopoly on this paradox. A Senator from Indiana, Birch Bayh observed way back in 1978, that, as he said, "…a wealth of scientific talented American colleges and universities – talent responsible for the development of numerous innovative scientific breakthroughs each year is going to waste its results on bureaucratic red tape and illogical government regulations. What sense does it make to spend billions of dollars each year on government supported research and then prevent new developments from benefiting the American people because of dumb bureaucratic red tape?"

I am sure nobody is in favour of dumb bureaucratic red tape, but what Senator Bayh observed is what we ultimately came to call the 'knowledge filter'. It says, just because there is investment in what we call knowledge… in this case what Bayh is talking about is university knowledge … it does not mean it will automatically spill over, thus igniting growth, innovation and jobs. Rather when there is a knowledge filter, we find that spillovers do not happen automatically.

Of course, in this case Senator Bayh was talking about the knowledge filter imposed by bureaucratic red tape, in the form of government regulations. As a result, he, and fellow Senator Bob Dole, convinced his colleagues in Congress to pass the Bayh-Dole Act, which I would interpret as a policy to try to reduce this knowledge filter. But really my point is that the world of knowledge and ideas is different from the world of physical capital. With physical capital, you know exactly what you have, but you are never really sure how good an idea is, what it can be used for, if it is really valuable or not. Knowledge has got this kind of uncertainty that will not just automatically spill over for commercialisation. We see this knowledge filter not just from knowledge generated in universities, as Senator Bayh was talking about, but we also see it in knowledge generated in the private sector from private companies.

Let me illustrate this by considering the case of three young men working for IBM some years ago in Germany. Arising from the project they had been working on, they developed some new business software. They thought that

this software would be a great new product for IBM to produce. So they went to their boss, they went to their boss's boss and said "let us start producing this business software". Their boss's boss said – "you know we do not think this is a real good idea, we do not think it is worth very much, we do not know who is going to want this software and in any case we do not make business software, we make computers." So they hit a knowledge filter. However, they were so passionate about their idea and thought it was valuable so they thought maybe we will start our own business. They went to the three top banks in Germany. The banks liked it and said this was a good idea. But they thought that if the idea was really marketable, IBM would be doing it, and so they were not willing to finance it. In the end one of them had a family connection to a regional bank, near Heidelberg, and they got seed finance to start what became known as SAP. And the rest is history. The point being that I think any time you hear of a knowledge context where the asset is not physical but rather intangible, like ideas, example after example after example of what one person thinks is a good idea, another person might not. Therefore, you get this knowledge filter not just in the public or university sectors, but also in the private sector.

Another famous example, also involving IBM, was when a young Bill Gates tried to sell Microsoft in the mid-1980s to IBM. It triggered the famous memo from an IBM Vice President: neither Gates nor any of his thirty employees have the qualifications to work for IBM; so IBM did not buy Microsoft. It was on the market for something like 30 million dollars, not a lot of money even then, and given what has happened since, it sounds funny today. But I would say that this kind of filter really is inevitable from the valuation of knowledge, as it is the result of ideas being uncertain, asymmetric – what one person thinks is a good idea, another does not. You could say that it is high cost transaction. What does that mean? Well in the SAP story for the boss's boss to understand why those three men thought that the software was a good idea, he would have literally had to be in their shoes. He would have had to understand what they were working on, whom they knew, what their social contact was and so on, and thus why they understood the world very differently. You can go to your boss and say 'here is a good idea'. I do not know about your boss, but my boss does not always agree with me.

V ENDOGENOUS ENTREPRENEURSHIP

So this is what leads to what we now call endogenous entrepreneurship, which refers to people endogenously creating a new firm to pursue and implement their ideas, dreams, and passions when they are unable to in the context of an existing firm. The traditional framework for thinking about firm

innovation is start with the firm as given, and then ask: "What can be done to help the firm become more innovative?" By contrast, endogenous entrepreneurship flips this around and starts with ideas embedded in people, and then asks: "What can be done to help individuals be more innovative?" In some cases, the answer is to start new firms. This shifts the policy focus from existing firms to a much broader set of individuals, institutions and society. This is a way to overcome the knowledge filter that keeps them from implementing their ideas.

In these cases the individuals with new ideas realise that the only way they can actually pursue those ideas is to start a new company. This is an endogenous response to knowledge that was created in an organisational context, be it a company or university. Without starting the new firm, the knowledge would not be completely or exhaustively commercialised. A number of people have trouble with this idea: why would a company create something valuable and then just walk away from it, saying it is not valuable? Of course, the reason for this lies in the nature of ideas – it is hard to tell which idea is valuable and which is not. Entrepreneurship has become interesting to policymakers because of the massive investment that society is making in knowledge in terms of human capital, in terms of research and in terms of cultural investment, as evidenced in the example of Sweden above and in Romano Prodi's statement. All of this investment creates people who are knowledgeable, thoughtful, creative, tolerant, well travelled, experienced. In effect, society has generated populations who receive the endowments that can generate ideas or can recognise ideas. When they are not able to act on these ideas in the organisational context, the entrepreneur serves as a conduit for taking these ideas out of the organisation where they are created. Sometimes the ideas will not work out, sometimes they will, and when they do, they generate innovation, growth and employment.

So what the Knowledge Spillover Theory of Entrepreneurship suggests is that, as we go from a context where there are not a lot of ideas or knowledge to a context where there are more ideas and knowledge, we would expect to see more entrepreneurship. The barriers to entrepreneurship, as Senator Bayh noted, are sometimes legal barriers; for example, in the former Soviet Union and Eastern Europe there were legal barriers prohibiting people from starting companies. People might have seen an opportunity to promote a new idea but legally they could not pursue it. The distinguishing point about this Knowledge Spillover Theory of Entrepreneurship, is that it is a theory of people rather than companies, taking action in the promotion of an idea. I think traditionally when scholars and policymakers have thought about entrepreneurship they thought about it in terms of the personal characteristics of the entrepreneur. There is a whole body of research that says

there must be something about people who become entrepreneurs – maybe it is their need for control, maybe it is their willingness to incur risk, something about their propensity and taste. In effect there is something about entrepreneurs that makes them different from, I will not say you and me but from me.

I mean I would not want to disagree with that research but I would say that the endogenous entrepreneurship model gives a different view. In this new model, it is not the people that are different, but rather the changed context where we have a society and an economy where ideas matter more than they did in the past – they are the driving force of economic activity – and in order for people to take advantage of those ideas, they have to become entrepreneurs.

This suggests that in order to get more innovation we do not just start with the firms that exist but rather start with society, people, and then ask how can these people be facilitated and enabled to pursue ideas and start companies that are going to generate growth. That is when entrepreneurship is endogenous.

I think the reason why policy is focusing so much more today on entrepreneurship is because of the localisation inherent in knowledge spillover entrepreneurship. One of the findings that has been shown statistically/econometrically is that knowledge spillovers are geographically concentrated. In other words, when there is investment in knowledge, R&D, science, human capital and so on, commercialisation tends to take place within the close geographic proximity to the knowledge sources. Knowledge spills over into entrepreneurship, which shows that when people have access to ideas, they are likely to start companies close to the source of those ideas. So for policymakers this is reassuring in a global economy when entrepreneurship polices are going to generate innovative activity close to home and not some other part of the globe. I think one of the complications for policymakers dealing with their own multinational corporations is these corporations are always looking for opportunities but some of those opportunities involve changing location and consequently the benefits may not accrue to the policymakers.

Studies comparing high-growth regions to low-growth regions have discovered what differentiates them. High-growth regions have high investments in knowledge compared with low-growth regions. High-growth regions have a low knowledge filter, so that knowledge is able to spillover. Low-growth regions have a high knowledge filter. How can we tell that? It is difficult, but if we look at places where we see high investments in science, research, etc., without a lot of commercialisation (e.g. patents) or other benefits accruing from those investments, then we can concur that there is a

high knowledge filter. High-growth regions have a high level of what I call entrepreneurship capital, that is, the capacity to generate entrepreneurs. Low-growth regions have a low level of entrepreneurship capital. Why is that? Well it is because entrepreneurship as I have said can serve as a conduit of growth. There have been several studies trying to link measures of entrepreneurship, either at a regional level, a city level or even at a national level, to different types of measures of growth. Typically, these studies find a positive relationship. For example, in a study we did in Germany from the 1990s, we measured start-ups in something like 93 regions of Germany. When we linked that measurement to levels of growth in Germany we found a positive relationship. As I said, this relationship has been found for a number of OECD countries and regions within OECD countries. So there is a statistical relationship, showing that places that do well in terms of growth tend to have high levels of entrepreneurship.

VI ENTREPRENEURSHIP AS *CREATIVE CONSTRUCTION*

Let me suggest that a Schumpeterian interpretation of the present situation is wrong. Everybody knows that Schumpeter observed that entrepreneurship triggered a process of creative destruction, so that the new entrepreneur drives the old incumbents out of the market with innovative activity. The reason why Schumpeter's analysis is not relevant nowadays is that if you think back to Schumpeter's works, he is always talking about one economy. He did not have the kind of global economy and the global competition that we have today. So where you see entrepreneurship in a single economy, it is going to displace the incumbents in that economy. If you think of that data that I mentioned earlier of employment change in Germany after the Berlin Wall fall, employment in the top German companies has declined in Germany and has increased outside of Germany. I do not think anybody is going to convince me that it is due to entrepreneurship in Germany. It is not because people in Germany are starting new auto companies and thereby driving out the employment in Volkswagen and so on. We know that this is happening because of globalisation, with employment being shifted due to outsourcing and offshoring, to some degree by the companies themselves to other places.

The concern of policymakers is with employment in most places in Europe and North America, as I think we are an 'employment-policy driven society'. Therefore, we are concerned about jobs and employment. The displacement of jobs is not the result of entrepreneurship, at least not entrepreneurship within Germany or Europe, but is due to globalisation. That destruction is going to

happen in terms of jobs, whether you look at the auto industry, the steel industry, or machine tools. That reduction of employment is not due to entrepreneurship in Germany, although you could interpret it as being due to entrepreneurship maybe in China or Asia. I would not want to argue with that interpretation, but the point in terms of a policy perspective, is that the destruction of these jobs is coming from globalisation.

I think that policymakers at the European level, such as Romano Prodi, as well as many national and regional policymakers now take that kind of globalisation and displacement of employment or destruction as part of the global order. They then ask: well how can we take our resources and get the most out of them? They see this coming from the major investments being made in knowledge, universities, education, human capital, culture and so on, and they want to generate more commercialisation from this knowledge investment. Entrepreneurship serves as a conduit, the mechanism by which those investments in knowledge translate into the market place to create innovations, jobs and competitiveness. So in that sense, entrepreneurship I think would be seen more as, creative construction rather than creative destruction, given those investments that have been made. I think that this is why we are seeing such a move towards an entrepreneurial economy and the European entrepreneurial policy response.

VII EUROPEAN ENTREPRENEURIAL POLICY RESPONSE

My view is that Europe has gone through a process of shifting away from the old economy or the capital-based economy characterised by the post-World War II public policy debate, towards this very different economy, what I call an entrepreneurial economy. In the entrepreneurial economy, entrepreneurship provides a driving force of economic growth. By the way, I am not saying that it is only entrepreneurship that counts. For example people can ask well, if entrepreneurship is so important what about Kenya? Kenya is nothing but micro-enterprises. Clearly physical capital is still very important. Places that do well in the European and, North American contexts have something extra over capital – they have entrepreneurship. So I would not want to say that supporting the entrepreneurial economy means throwing out or burning down the factories and closing up the universities – in fact it is the opposite. It is the combination of capital and entrepreneurship that generates employment but in a more complex manner than in the past.

With respect to the entrepreneurial economy model I think that policy in Europe and in North America has gone through five stages: denial, recognition, envy, consensus and attainment.

Denial was prevalent in the 1980s. At that time I think there was a sense in Europe that when people and policymakers thought about what generated success, generated growth and employment productivity, they thought about manufacturing. Certainly, that was the inheritance from a famous book written by Jean-Jacques Servan-Schreiber back in the 1960s, *The American Challenge*. What was that challenge? It was to create companies like General Motors, US Steel – the great manufacturing companies. So there was a denial about entrepreneurship and they looked to places like Silicon Valley where there were lots of start-ups and so on. They also had many firms going out of business, they were involved in a kind of industry or economic restructuring.

The second phase, *recognition*, probably started after the Berlin Wall fell in the early 1990s. There was also recognition of the law of comparative advantage. So while the entrepreneurial model began to be recognised, the law of comparative advantage was invoked which was interpreted in this context to say that Silicon Valley can produce software and microprocessors, Europe can produce machine tools, autos and so on. And they can trade, so there was a sense that the entrepreneurial development was valuable but not necessarily for Europe. There was a sense too of the European small and medium-sized enterprises, what we call the *Mittelstand,* being very different from this entrepreneurship model. In this *Mittelstand,* there are companies in traditional sectors, such as machine tools and metal working. In the entrepreneurship model, the companies are in new sectors. Why is that? Because they are based on ideas that other people typically rejected as not being valuable. The *Mittelstand* tradition is low R&D, while the entrepreneurial models focus on typically high R&D entrepreneurs based on high human capital, higher wages.

This entrepreneurial economy generates a lot of turbulence, with many companies being started, and a lot of companies going out of business. In the *Mittelstand* and certainly in Germany, but I think elsewhere in Europe, there is much more stability, lower start-up rates, lower failure rates, with finance tending to come from traditional sources – banks, finance institutions, etc. Where we have an entrepreneurial model at work we see new sources of finance in the sense that it is non-bank finance, often from angel capital. People talk about venture capital but that is actually just miniscule, it accounts for just a miniscule amount of the finances. This results in high-growth companies in the entrepreneurial model and low-growth companies in the *Mittelstand*, and so there is a recognition that there was difference. In the middle of the 1990s the continent of Europe really went through stagnation – low growth, and more unemployment, and it was clear that globalisation was hitting Europe. There was a sense that the social contract that you have in countries like Germany, France and Sweden was not sufficient to maintain employment in those countries.

The third phase is *envy*, I say envy, because I must have read in Germany ten or twelve times that these places would copy, just copy each other and if Bill Gates was in Germany there would be no Microsoft. It seemed to imply that you could not have somebody like Bill Gates growing up in Germany as the education system, the culture, and certainly a lot of the laws and a lot of the policies would have made it difficult for him. It would have been difficult to attract employees to a company that was starting up, because people want long-term employment contracts and so on. It would have been difficult for him to get finance to start up and so on. So there was a sense of incompatibility of European institutions with this kind of entrepreneurial model, even though there was an increasing recognition that entrepreneurship can induce growth.

But this gave rise to a fourth phase, *consensus,* which occurred around the Lisbon European Council and the Lisbon mandate. It was not limited to Lisbon, and for example, it was even more prevalent in the Gothenburg European Council. I think also that individual European countries have embraced entrepreneurship as well, triggered in part by policymakers visiting the US and not just Silicon Valley. They saw this entrepreneurial driven economy in places like Austin, Texas; Raleigh, North Carolina; Madison, Wisconsin. I think they had a sense that if they can do it in North Carolina, then we can surely do it in Munich or Stockholm. And there was a sense that institutions can change and that is what led to this idea, of seeking to get German research back into the top tier of world research. Of course, that was before the current economic crisis, but I think it is a long-term change. There is now a core commitment – in Germany, Sweden, Netherlands, most of northern Europe – to becoming a knowledge and entrepreneurial driven economy. That is seen as the way to grow and perform and succeed in terms of global competitiveness, and this brings us to the final stage, *attainment*.

VIII CONCLUDING REMARKS

Let me close by suggesting that we have seen a shift in public policy away from a focus on generating investments in physical capital. With that, the focus was on how do you live with the beast of big business? To drive efficiency, you need economies of scale, but this raises the challenge when firms are not trusted to grow unabated. So there are lots of regulations, public ownership, and competition policies to constrain behaviour. In the entrepreneurial economy, it is a much more enabling policy that is at work. How do you enable individuals to access ideas and then act on those ideas? Of course one difference, when we talk about large incumbent corporations, is whether we

are talking about individuals or small groups of individuals, I think public policy in the economy driven by physical capital had a national focus. Public ownership regulations, tended to be national policies. In the entrepreneurship economy framework, because the knowledge tends to be local – university, a company or cluster of companies associated with a place – the policies and the benefits tend to be decentralised as well. This is perhaps one of the things that people have been slower to pick up on, where we see deregulation, and privatisation, we see less competition policy over time. I think what we have not been able to see as much of because it is harder to measure, is the emergence of lots and lots of innovation and entrepreneurship policies in the city and at local level.

Let me finish with a quote from Goethe which suggests that maybe this is not so new. He wrote a couple of hundred years ago – *…it is not enough to know, you also have to do it, it's not enough to want, you have to implement it*. It would suggest that it is not enough to have the knowledge but you have to implement it.