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# Does the Entrepreneurial Economy Need an Entrepreneurial University?

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A quiet and virtually unnoticed revolution is transforming public policy. Where policy to ensure economic growth and job creation once looked to fiscal and monetary stimulation on the one hand, and the large corporation on the other, a new approach has emerged focusing on promoting the spillover of knowledge through university entrepreneurship. What once seemed as an anathema to economic efficiency and prosperity in the post-war era – the entrepreneurial university – has apparently become a key player in generating economic growth and job creation, not just in one economy, but spanning a broad spectrum of national, regional and local contexts.

Following the decade of Europe's worst economic performance since the Second World War, including record unemployment, it may not have been surprising when a bold new strategy to spur economic growth was unveiled. However, the focus of this new European growth policy would have seemed unimaginable only a few years earlier. With the 2000 Lisbon Proclamation, Romano Prodi, the then President of the European Commission committed Europe to becoming the knowledge and entrepreneurship leader in the world by 2020 in order to ensure prosperity and a high standard of living throughout the continent.

Similarly, at the 2006 Spring Summit of the European Government Leaders, igniting economic growth and reducing unemployment in Europe was the main focus of the Summit. The main policy strategy identified at the summit was entrepreneurship. According to the Chancellor of Austria and President of the European Council Wolfgang Schüssel, recently urged, "The Member States of the European Union must finally realize that they have to undertake everything possible to facilitate the creation of new jobs and economic growth. There would be ten million new jobs created in the European Union by 2010, if the member

countries were prepared to implement the necessary reforms, and especially reduce bureaucracy in order to promote entrepreneurship.”<sup>1</sup>

Romano Prodi and the European Union were not alone in turning to entrepreneurship to provide the engine of economic growth. The entrepreneurial policy mandate mirrored similar efforts throughout the developed world. Public policy spanning a broad spectrum of national, regional and local contexts has been turning to university driven knowledge entrepreneurship to replace old jobs which were being lost to outsourcing and globalization, while at the same time to harness the potential that remained largely dormant from significant long-term investments in knowledge, such as universities, education and research institutions.

Only a few years earlier the policy debate focusing on growth and employment had looked to the macroeconomic instruments of fiscal and monetary policy on the one hand, and the size and scale economies yielded by the large corporation on the other. Writing in the post-war era, Solow was awarded the Nobel Prize for his model of economic growth based on what became termed as the neoclassical production function. In the Solow model two key factors of production – physical capital and (unskilled) labor were econometrically linked to explain economic growth. Growth policy, or economic policy for growth, if not shaped by the Solow theoretical growth model, certainly corresponded to the view that inducing investments in physical capital in particular was the key to generating economic growth and advances in worker productivity. Both the economics literature and the corresponding public policy discourse was decidedly focused on which instruments, such as monetary policy versus fiscal policy, or interest rates versus capital depreciation allowances, were best suited to induce investment in physical capital and ultimately promote growth. While these debates may never have been satisfactorily resolved, their tenacity reflects the deep seated belief about the primacy of capital investment as the fundamental source of economic growth.

If physical capital was at the heart of the Solow economy, knowledge capital replaced it in the Romer economy. While the policy goals remained relatively unchanged, economic growth, the Romer model reflected the emergence of a new emphasis on a strikingly different policy mechanism, knowledge capital, involving very different policy instruments.

The new policy instruments corresponding to the knowledge-driven economy, or the Romer Model, generally involved inducing investments not necessarily in physical capital but rather in knowledge capital. While the concept of knowledge capital seemed to be vaguer and less conducive to measurement than did the traditional factor of physical capital, it clearly involved knowledge augmenting investments in human capital and research and development. Such instruments

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<sup>1</sup> Schlüssel: „Zehn Millionen Arbeitsplätze bis 2010: Der Ratspräsident ruft die EU-Staaten zu Reformoffensive auf – ‚Mittelstand fördern, Entbürokratisierung vorantreiben‘“, *Die Welt*, March 18, 2006, p. 1.

were strikingly different than their counterparts corresponding to the Solow economy. These instruments included, but were not limited to, education at all levels, public research support, tax and subsidy incentives to encourage private R&D, and investments in education and research at universities.

In the Solow economy investment in universities was not necessarily viewed as an instrument promoting economic growth in the capital-driven economy. After all, it was not at all clear how the output of universities, students and research, would contribute to augmenting investments in capital. While there was an important case to be made for investing in universities for political, social and even moral reasons, the case was less compelling for economic reasons, and particularly for economic growth. It was indeed possible to view investments in universities as actually detracting from economic growth, in that they diverted resources away from physical capital. But no one can dispute the primacy of investment in universities in the Romer economy. Investments in new knowledge were expected to be particularly potent because of the assumption that knowledge spills over from the firm or research organization creating that knowledge to other firms for commercialization, thus resulting in increasing returns in terms of economic growth.

Thus, just as the enormous investment in physical plant and equipment propelled Europe and North America to unprecedented post-war prosperity in the Solow economy, both scholars and policy makers have been looking towards the unrivaled investment in research and knowledge to generate economic growth, employment and competitiveness in the era of globalization.

But how does this knowledge created at universities spill over for commercialization in the market? Does it simply not fall, but perhaps blow over, like Robert Solow's famous *manna from heaven*, ripe for commercialization by the private sector? There are compelling reasons to think that it is not so easy or automatic. Certainly there is a long tradition of a wall between the university and the community. A barrier divided the university from the rest of society. This wall may have been invisible but it was keenly felt by those on each side. Professors and students were proudly and certainly gladly cut off from society and isolated in the ivory tower afforded by the gates of the university. Those on the outside peered at a distance, typically with disdain and curiosity, if not hostility towards this ivory tower.

Much has been made about the so-called *European Paradox*, where high levels of investment in new knowledge exist from both private firms as well as public research institutes and universities. Countries such as Sweden rank among the highest in terms of investment in research, at least as measured by the ratio of R&D-to-GDP. Similarly, levels of human capital and education in Sweden as well as throughout many parts of Europe, rank among the highest in the world. Yet, growth rates remained stagnant and employment creation sluggish throughout the 1990s and into the new century.

Thus, it is now recognized that investment in scientific knowledge and research alone will not automatically generate growth and prosperity. Rather, such knowledge investments must penetrate what Audretsch et al. (2006) term as *the knowledge filter*, in order to contribute to innovation, competitiveness and ultimately economic growth. In fact, the knowledge filter impeding the commercializing of investments in research and knowledge can be formidable. As the American Senator Birch Bayh warned, “A wealth of scientific talent at American colleges and universities – talent responsible for the development of numerous innovative scientific breakthroughs each year – is going to waste as a result of bureaucratic red tape and illogical government regulations...”<sup>2</sup> It is the knowledge filter that stands between investment in research on the one hand, and its commercialization through innovation, leading ultimately to economic growth, on the other.

Certainly seen through the eyes of Senator Bayh, the magnitude of the knowledge filter is daunting, “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?”<sup>3</sup>

In this case there will be no knowledge spillover. Investments were made in creating new knowledge, both privately from the firm, but also publicly, if generation of the new knowledge utilized any type of public knowledge emanating from research at universities or publicly provided investments in human capital. However, in the absence of knowledge spillover, such investments will not be appropriated either by the firm or by society. It must not be forgotten that the social investments of education and research are also expected to generate a return in terms of growth and employment.

Thus, the spillover of knowledge that exists by assumption in the Romer (1986), Lucas (1993), and Krugman (1991) models, may, in fact, not be so automatic.

In an effort to penetrate such a formidable knowledge filter, the Congress enacted the Bayh-Dole Act in 1980 to spur the transfer of technology from university research to commercialization.<sup>4</sup> The goal of the Bayh-Dole Act was to spur the commercialization of university science. Assessments about the impact of the Bayh-Dole Act on penetrating the knowledge filter and facilitating the commercialization of university research have bordered on the euphoric<sup>5</sup>, “Possibly

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<sup>2</sup> Introductory statement of Senator Birch Bayh, September 13, 1978, cited from AUTUM (2004, p. 5).

<sup>3</sup> Statement by Birch Bayh, April 13, 1980, on the approval of S. 414 (Bayh-Dole Act) by the U.S. Senate on a 91-4 vote, cited from AUTUM (2004, p. 16).

<sup>4</sup> Public Law 98-620.

<sup>5</sup> Mowery (2005, p. 2) argues that such a euphemistic assessment of the impact on Bayh-Dole is exaggerated, “Although it seems clear that the criticism of high-technology startups that was widespread during the period of pessimism over U.S. competitiveness was overstated, the recent focus on patenting and licensing as the essential ingredient in

the most inspired piece of legislation to be enacted in America over the past half-century was the Bayh-Dole Act of 1980. Together with amendments in 1984 and augmentation in 1986, this unlocked all the inventions and discoveries that had been made in laboratories through the United States with the help of taxpayers' money. More than anything, this single policy measure helped to reverse America's precipitous slide into industrial irrelevance. Before Bayh-Dole, the fruits of research supported by government agencies had gone strictly to the federal government. Nobody could exploit such research without tedious negotiations with a federal agency concerned. Worse, companies found it nigh impossible to acquire exclusive rights to a government owned patent. And without that, few firms were willing to invest millions more of their own money to turn a basic research idea into a marketable product."<sup>6</sup>

An even more enthusiastic assessment suggested that, "The Bayh-Dole Act turned out to be the Viagra for campus innovation. Universities that would previously have let their intellectual property lie fallow began filing for – and getting patents at unprecedented rates. Coupled with other legal, economic and political developments that also spurred patenting and licensing, the results seems nothing less than a major boom to national economic growth."<sup>7</sup>

University entrepreneurship can contribute to economic growth by serving as a mechanism that permeates the knowledge filter. It is a virtual consensus that entrepreneurship revolves around the recognition of opportunities along with the cognitive decision to commercialize those opportunities by starting a new firm. If investments in new knowledge create opportunities that are asymmetric, in that they are more apparent or valued more highly by economic agents (potential entrepreneurs) than by the incumbent firms themselves, the only organizational context for commercializing that new idea will be a new firm. Thus, by serving as a conduit for knowledge spillovers that might otherwise not exist, entrepreneurship permeates the knowledge filter and provides the missing link to economic growth. Audretsch, Keilbach and Lehmann (2006) show that those regions in Germany with the greatest amount of entrepreneurial activity also exhibit the highest growth rates.

Shifting to a policy focus on knowledge capital involving instruments to induce investments in knowledge capital has clearly been successful in generating economic growth in many regions. However, as the knowledge spillover theory of entrepreneurship suggests, investments in knowledge capital such as university research and education may be a necessary but not a sufficient condition to ensure that such investments are actually commercialized and generate economic growth.

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university-industry collaboration and knowledge transfer may be no less exaggerated. The emphasis on the Bayh-Dole Act as a catalyst to these interactions also seems somewhat misplaced."

<sup>6</sup> "Innovation's Golden Goose," *The Economist*, December 12, 2002.

<sup>7</sup> Cited in Mowery (2005, p. 2).

The existence of a severe knowledge filter will impede the spillover and commercialization of investments in new knowledge, thereby choking off the potential for economic growth.

From the perspective of the singular or effectively closed economy at the turn of the last century may have led Schumpeter (1911) to conclude that the contribution of entrepreneurship is through the destruction of the status quo by displacement by new firms, or creative construction. However, in the globalized economy of the twenty-first economy, the destruction comes from global competition. *Creative construction* of new possibilities and sources of growth comes from sources such as university entrepreneurship.

There is no patent recipe for public policy to create an entrepreneurial economy. But the effort to do so has resulted in the emergence of a distinct new public policy approach to generate economic growth – entrepreneurship policy. While the goals remain the same, economic growth and employment creation or at least maintenance, the mechanism used, entrepreneurship, and accompanying instruments, are strikingly different.

In response to the new consensus that the old university model no longer suffices, Germany introduced a bold new policy to move towards the entrepreneurial university. This new public policy approach is a striking rejection of the post-war policies of homogeneity and standardization, with the concomitant result of curbing competition across institutions. Rather, this new policy approach injects competition across universities through the introduction of a policy instrument called the “*Exzellenzinitiative*”, or Excellence Initiative. Over a five year period, starting in 2005, the German government is investing EUR 1.9 billion to explicitly create what is termed as “Elite Universities”. These funds will be awarded to those universities that have developed at least the potential for excellence in research in particular research fields.<sup>8</sup> After years of perhaps admiring in particular the top American Universities, but writing them off as another example of American elitism and exclusivity, to the disadvantage of those not afforded access to such universities, the Germans have radically reversed directions and are now embracing “elite” universities. The old approach would have been to spread the funding around, in a virtual quota system, where each region got its share. But under this new policy, instead, these new elite universities are concentrated particularly in the state of Bavaria, where several universities, including the Ludwig-Maximilian University of Munich and the Technical University of Munich were selected along with eight other German universities to be targeted for becoming “elite.”

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<sup>8</sup> “Der Triumph des Südens”, Focus, No. 5, January 30, 2006, 48–49.

Why has Germany reversed its policy towards higher education and research? Because it recognizes that in the global economy, the old, traditional Humboldt University, which is cut off from society, does not suffice. Rather, Germany, like countries around the globe is now committed to create the entrepreneurial university. Germany spent too many years on the sidelines, saddled with a policy approach inhibiting not just state-of-the art research and scholarship, but also their commercialization and application in the economy. It has turned out that the investment that the United States has made in universities and research was not just an extravagant expenditure but rather the foundation for generating growth and competitiveness in the global economy.

Georg Winckler, President of the European Conference of University Presidents, emphasizes that in this new century, “The higher is the level of education and human capital of citizens, the higher will be the standard of living. Human capital and education are the most important source of a high standard of living. Europe is suffering from a clear deficit of such human capital and education. In contrast to the United States there is too low of a share of the European population with a degree in higher education.”<sup>9</sup>

One thing has become clear from the recent and startling revolution that is now beginning to shake up the sleepy European universities. The entrepreneurial university has emerged as a central institution and source of not just scientific and knowledge but also cultural and social in helping to create the entrepreneurial economy.

As first the capital-driven Solow model and more recently the knowledge-driven Romer model have not delivered the expected levels of economic performance, a mandate for entrepreneurship policy has emerged and begun to diffuse throughout the entire globe. Whether or not specific policy instruments will work in their particular contexts is not the point of this paper. What is striking, however, is the emergence and diffusion of an entirely new public policy approach to generate economic growth – entrepreneurship policy. It is becoming increasingly the case that it is upon this new mantle of entrepreneurship policy that *Standorte*, ranging from communities to cities, states and even entire nations hang their hopes, dreams and aspirations for prosperity and security.

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<sup>9</sup> “Entscheidend ist die Bereitschaft neues Wissen anzunehmen,” *Frankfurter Allgemeine*, March 11, 2006, p. 12.



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