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EUROPE'S INNOVATION LANDSCAPE

Research and Library Services

This paper outlines the results of the European Innovation Scoreboard 2007, before taking a closer look at the innovation strategies of four of the top European performers, noting areas of convergence between approaches.

EXECUTIVE REVIEW

PERFORMANCE; Global *Innovation Leaders* include Denmark, Finland, Germany, Israel, Japan, Sweden, Switzerland, the UK and the US. Sweden is the most innovative country, due to large innovation inputs, although, a degree of inefficiency in transforming inputs to outputs compared to other countries is noted. This paper examines four of these leaders, Sweden, Denmark, Finland and Germany.

STRATEGY COMPARISON; the following areas are common to all regional innovation strategies (unless stated otherwise).

- **EDUCATION;** particularly prominent in Denmark's strategy, educational measures promoting innovation include; increasing the commercialisation of research, developing the educational system across all levels (from primary to post-graduate), better linking industry and the research base, attracting and retaining international researchers, and improving international research links.

- **GLOBALISATION;** all regions recognise the significance of the global market and alter their innovation strategy accordingly. Common measures include; revising taxation, attracting FDI, maximizing language skills, internationalizing research, and attracting overseas talent.

- **ENTREPRENEURSHIP/BUSINESS GROWTH;** all four regions identify business start-ups and business growth as key drivers of innovation. Key initiatives include; reducing regulatory barriers, improving business leadership, educational courses in entrepreneurship, and high technology start-ups.

- **TECHNOLOGY;** exploiting technological advances is a theme running through all four innovation strategies. It is perhaps most evident in Germany's policy document which is itself a High-Tech strategy rather than a typical innovation strategy in the mould of the other three documents. Key growth areas are: energy, security, nano/biotechnology and medicine.

- **PUBLIC SECTOR;** reforming the public sector is key to all regions bar Germany. Taxation and bureaucracy reform are the two areas most likely to see transformation.

STRATEGY SUMMARIES

SWEDEN; broad areas of action include:

- Ensuring that Swedish education and research are world class;
- Concentrating efforts in Swedish profile areas;
- Seizing the opportunities presented by globalisation;
- Strengthening the innovative capacity of existing small and medium-sized enterprises
- Using the public sector as an agent for sustainable growth;
- Promoting renewal and efficiency in the public sector;
- Developing infrastructure the promotes renewal and sustainable growth;
- Stimulating entrepreneurship and enterprise;

- Making the most of people's skills.

FINLAND; initiatives include:

- The central government's corporate steering group will be renewed for the purpose of becoming a worldwide pioneer of systematic reform;
- Content-orientated and regional centres of innovation driving renewal will be formed;
- The financing and service system promoting growth entrepreneurship will be renewed into a clear entity, operating with entrepreneur and investor orientation;
- New competitive market incentives activating enterprises and other communities in innovation on a broad basis will be created and exploited;
- The national ensemble of expert and financing services will be updated to meet the needs of demand and user-orientated innovation activity;
- A learning environment motivating innovation on a broad basis will be developed;
- The research and higher education system will be developed into an internationally competitive development environment for expertise and innovations;
- Personal taxation and other key factors essentially weakening Finland's attractiveness will be revised to a competitive level;
- Management and training will be developed to meet top international standards; and
- The strategies and operations of parties implementing innovation policy will be adapted to be in line with the basic choices of the innovation strategy.

DENMARK; policy interventions include the following:

- World top performing primary and lower secondary school system;
- All young people should complete a general or vocational upper secondary education programme;
- A coherent education system and professional guidance;
- Education and training programmes with a global perspective;
- World top-level short-cycle and medium-cycle higher education system;
- World top-level universities;
- Competition and better quality in public research;
- Good framework conditions for companies' research, development and innovation;
- Stronger competition and greater openness and transparency to strengthen innovation;
- More high-growth strategies;
- Lifelong learning.

GERMANY

- Gaining a leading position on the markets of the future by offering top-class and horizontal technologies;
- Strengthening the powers of innovation in small and medium-sized companies;
- Strengthening Germany's efficiency and international attractiveness;

CONTENTS

1 INTRODUCTION

> *"In a remarkably short period of time, economic globalisation has changed the world economic order, bringing new opportunities and new challenges. To compete, Europe must become more inventive, react better to consumer needs and preferences and address global and environmental challenges by innovating more*[i]*."*

The statement above, taken from the European Commission's Innovation Policy, highlights the significance placed upon innovation as a key driver of economic prosperity and well-being in developed economies throughout world.

This research focuses on innovation within the European Union, examining innovation performance on an EU wide basis. The paper will then take a closer look at the innovation strategies of four of the top European performers, before finally noting areas of convergence between approaches.

2 EU MEMBER STATE PERFORMANCE

Since the 2002 Barcelona European Council, EU member states have operated towards a target of achieving an innovation spend equivalent to 3% of GDP by 2010[ii]. At present, less than 2% of Europe's GDP is spent on innovation, compared to 2.5% in the US and 3% in Japan[iii]. Commentary on the Europa website states progress towards this goal has remained "*too slow"* since it was set in 2002.

Since 2000, an assessment of innovation performance throughout the EU and beyond has lead to the annual publication of the European Union Innovation Scoreboard (EIS). It is perhaps interesting to point out, before outlining the latest results, that despite a general trend towards convergence, the ranking of countries has remained relatively stable since over the past five years. The current report suggests this stems from convergence being the result of a general trend rather than the consequence of exceptional developments in individual countries[iv].

The key findings of the most recent EIS are listed below:

- Global *Innovation Leaders* include Denmark, Finland, Germany, Israel, Japan, Sweden, Switzerland, the UK and the US. Sweden is the most innovative country, due to large innovation inputs, although, a degree of inefficiency in transforming inputs to outputs compared to other countries is noted;

- *Innovation Followers* include Austria, Belgium, Canada, France, Iceland, Ireland, Luxembourg and the Netherlands;

- *Moderate Innovators* include Australia, Cyprus, Czech Republic, Estonia, Italy, Norway, Slovenia and Spain;

- *Catching-up Countries* include Bulgaria, Croatia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania and Slovakia;

- Turkey currently ranks significantly lower than all other countries;

- Of those countries with follower status Luxemburg is poised to enter the leader category;

- The Czech Republic, Estonia and Lithuania are on track to reach the European average within a decade.

Table 1 ranks each country by Summary Innovation Index (SII). SII provides an "at a glance" overview of aggregate national innovation performance, incorporating measures such as; innovation drivers, entrepreneurship, knowledge creation, applications, and intellectual property.[v]

The EIS highlights the following aspects of EU innovation in general:

- The existence of a *"persistent but decreasing"* innovation gap with US and Japan

- Innovation policies do not take sufficient account of the needs of services innovators;

- Social capital and knowledge flows are potential key factors in innovation performance;

- Member states could improve their efficiency in transforming innovation inputs into outputs;

- Non-R&D based innovation is as widespread as R&D driven innovation.

The sections which follow will examine the current innovation strategies of four of the innovation leaders; Sweden, Finland, Denmark and Germany.

TABLE 1: INNOVATION PERFORMANCE BY SII – EU AVERAGE EQUALS 0.45[vi]

Country	SII	Category
Sweden	0.73	Leader
Switzerland	0.67	
Finland	0.64	
Israel	0.62	
Denmark	0.61	
Japan	0.60	
Germany	0.59	
UK	0.57	
US	0.55	
Luxemburg	0.53	Follower
Iceland	0.50	
Ireland	0.49	
Austria	0.48	
Netherlands	0.48	
France	0.47	
Belgium	0.47	
Canada	0.44	
Estonia	0.37	Moderate
Australia	0.36	
Norway	0.36	
Czech Rep	0.36	
Slovenia	0.35	
Italy	0.33	
Cyprus	0.33	
Spain	0.31	
Malta	0.29	Catching-up
Lithuania	0.27	
Hungry	0.26	
Greece	0.26	
Portugal	0.25	
Slovakia	0.25	
Poland	0.24	
Croatia	0.23	
Bulgaria	0.23	
Latvia	0.19	
Romania	0.18	
Turkey	0.08	

3 SWEDEN

3.1 FRAMEWORK FOR INNOVATION

Sweden's place at the top of the European Innovation Scoreboard is in sharp contrast to the Country's economic climate in the early 1990s, when the region was marked by rising employment and failing industry. Innovative Sweden – A Strategy For Growth Through Renewal, which was published in 2004 and remains the areas key innovation strategy, outlines the results of an '*often painful measure*' which enabled Sweden to transform its economy from downturn to European leader[vii].

INVESTMENTS IN KNOWLEDGE; Sweden has historically been one of the largest investors in education in the world relative to the size of its economy. In 2001 total R&D spend equalled 4.3% of GDP, ahead of the USA, Japan and the OECD average.[viii]

A HIGHLY SKILLED LABOUR FORCE; According to the OECD's international comparisons, Sweden as the highest proportion of workers in knowledge-intensive jobs.[ix]

INTERNATIONALISATION; Approximately 60 per cent of goods produced in Sweden are exported, ensuring that it is one of the most internationalised economies in the world. Exports increased from 29 per cent in 1980 to 44 per cent in 2003. Similarly, the proportion of international workers employed in Swedish companies grew from 45 per cent in 1990 to 64 per cent in 2001. Between 1990 and 2004 the number of people employed by foreign owned companies rose from 300,000 to just over half a million. A significant proportion of foreign investment into Sweden is in high-value sectors in which R&D plays an important role. Swedish investment abroad is on par with inward investment into the region, measuring SEK 1,320 and SEK1409 respectively between 1994 and 2003. Swedish companies and the research base operate in collaborative international research networks.[x]

PUBLIC SECTOR; Sweden has a comparably large public sector, which provides a third of all the jobs in the country and is renowned for knowledge intensive jobs and high work intensity. Approximately half of all graduates are employed in public sector jobs. Historical public private interactions have been instrumental in developing knowledge-based activities. The administrative system is less bureaucratic than in many countries. The country has also been a global leader in the spread of communications infrastructure.[xi]

DIVERSIFIED BUSINESS SECTOR; Sweden has high skill levels and competitiveness in many industries. Success in historically established industries; forestry, paper, vehicle manufacturing, mining, steel, telecommunications and pharmaceuticals, has been matched by successes in technologically intensive industries; information technology, microelectronics, biosciences, equipment for health care, and vehicle and road traffic safety. Sweden is also recognised as a world leader in providing environmental solutions. Industry movement towards more technological areas has been couple with advancement amongst Swedish consumers.[xii]

3.2 CURRENT STRATEGY

Sweden's current innovation strategy is informed by the following recognitions; the economy is increasingly global, knowledge-intensive industries and products are becoming increasingly important, sustainability is an issue of growing importance, Sweden's domestic population is ageing, and a new division of roles among international and sub-national levels is developing. Four priority areas underpin the country's innovation strategy:

- Developing a knowledge base for innovation;
- Developing innovative trade and industry;
- Ensuring innovative public investment;
- Encouraging innovative people.

Within each of these broad areas there are sub-areas which will be outlined individually.[xiii]

3.2.1 KNOWLEDGE BASE FOR INNOVATION

ENSURING THAT SWEDISH EDUCATION AND RESEARCH ARE WORLD CLASS; to compete in an increasingly globalised market Sweden deems it necessary to strengthen its post-graduate education system and research base. Key actions in this area include; create a school system that gives everyone basic skills, promote mathematical skills and an interest in science and technology, promote lifelong learning, ensure competitive higher education institutions, encourage international student and researcher mobility, continue to invest in research and research education, and strengthen industrial research institutes.[xiv]

CONCENTRATE EFFORTS IN SWEDISH PROFILE AREAS; the development of knowledge-intensive industry, traditional industry and the public sector is deemed by the Swedish government to depend on access to the new knowledge needed to develop innovations and modernise their operations. Specific actions in this area include; the prioritising of strategic areas in research and business sector, increasing interaction between industry and the public sector, and promoting regional specialisation in combination with national priorities.[xv]

SEIZING THE OPPORTUNITIES PRESENTED BY GLOBALISATION; In a global economy Sweden's already internationalised economy is a great strength. To further improve the country's position and maximise the opportunities globalisation presents the government proposes the following actions; promoting foreign language skill, marketing Swedish business in strategically important markets (new EU member countries, Russia, Asia and India), attract FDI and skills, ensure an internationally competitive corporate tax rate, and develop the image of Sweden as an innovative country.[xvi]

3.2.2 INNOVATIVE TRADE AND INDUSTRY

STRENGTHEN THE INNOVATIVE CAPACITY OF EXISTING SMALL AND MEDIUM-SIZED ENTERPRISES; the transformation of Sweden's economy towards more

knowledge intensive industry has resulted in a higher added-value level. Despite this the number of SMEs engaged in R&D remains relatively low, and was, as of 2002, behind that of over Scandinavian countries. To rectify this, the Swedish government proposed a strategy incorporating; a strengthening of strategic collaboration between enterprises, increasing cooperation between company networks, higher education institutions and research institutes, developing support for product design, developing production technologies and production systems, encouraging SMEs to invest in R&D, and the promotion of SME capacity to compete internationally.[xvii]

INCREASING THE COMMERCIALISATION OF RESEARCH RESULTS AND IDEAS; recognition of further opportunities to 'hive off' new enterprises and the develop enterprises from university research, alongside a noticeable lack of sustainable structures for advice or for meetings between innovators and entrepreneurs, led the Swedish government to make the following commitments; to transform research results and ideas more effectively into businesses and enterprises, increase financing at early stages of business and company development, design workable ground rules and promote the use of intellectual property protection, and create sound conditions for competition that favour the growth of new enterprises.[xviii]

3.2.3 INNOVATIVE PUBLIC INVESTMENT

USING THE PUBLIC SECTOR AS AN AGENT FOR SUSTAINABLE GROWTH; Sweden has identified an opportunity to better capitalise on its public sector, extending its role as a buyer and specifier of goods, services and systems. The public sector's role as an investor is also deemed to have further scope, particularly as an engine for social renewal and enterprise. The following actions have been put forward; ensuring that publicly financed activities contribute to creating products and services for export, making use of the industrial and technological potential of the defence and security sector for civil applications, developing more forceful, demanding public procurement, and developing regulations that force the pace of renewal.[xix]

PROMOTING RENEWAL AND EFFICIENCY IN THE PUBLIC SECTOR; the Swedish government recognise that an ageing population is likely to put pressure on the public sector due to greater demands on core areas, such as health and social services, and possible staff shortages in the future. To account for this the following steps have been put forward; operating public services more effectively and innovatively (including the use of IT), developing new solutions to meet the needs of society (including more environmental friendly vehicles and treatments to enable earlier detection of Alzheimer's disease).[xx]

DEVELOP INFRASTRUCTURE THE PROMOTES RENEWAL AND SUSTAINABLE GROWTH; to ensure the *well-functioning transport and logistics systems* deemed to be necessary for sustainable development the Swedish government will; develop effective systems for transport and logistics, increase mobility in and between local labour market regions, and develop an IT infrastructure for the future.[xxi]

3.2.4 INNOVATIVE PEOPLE

STIMULATING ENTREPRENEURSHIP AND ENTERPRISE; compared to other countries, Sweden's enterprise culture is somewhat lacking, to encourage more

business start-ups the government will; promote positive attitudes towards entrepreneurship (at political educational and public sector level) and secure a simple and expedient regulatory framework that facilitates enterprise.[xxii]

MAKING THE MOST OF PEOPLE'S SKILLS; to promote innovation Sweden plans to create a climate in which employees can *renew their skills, and organisations can pursue efficient processes of change*. To this end the government will pursue the following actions; develop working organisations that encourage renewal, make better use of everyone's skills, and increase mobility between the business and academic communities, the public and private sector.[xxiii]

4 FINLAND

4.1 FRAMEWORK FOR INNOVATION[xxiv]

Finland's current innovation strategy was developed through an open and participative process. In 2007, eleven thematic innovation workshops were held, with a total of 300 experts participating. An internet consultation was also held, involving over 500 residents.

The Finish economy is one recognised to be in a period of flux. The basic precondition of the country's innovation strategy is taking into account drivers of change. Four drivers have been identified; globalisation, sustainable development, new technologies, and an ageing population.

As a result of these pressures, the Government developed its strategy with actions and development across four key strategic areas; innovation in a world without borders, demand and user orientation, innovative individuals and communities, and a systematic approach.

4.2 CURRENT STRATEGY [xxv]

Finland's innovation strategy revolves around ten key sets of measures:

- The central government's **corporate steering group** will be renewed for the purpose of becoming a worldwide pioneer of systematic reform;
- **Content-orientated** and **regional centres of innovation** driving renewal will be formed;
- The financing and service system **promoting growth entrepreneurship** will be renewed into a clear entity, operating with entrepreneur and investor orientation;
- New **competitive market incentives** activating enterprises and other communities in innovation on a broad basis will be created and exploited;
- The national **ensemble of expert and financing** services will be updated to meet the needs of demand and user-orientated innovation activity;

- A **learning environment,** motivating innovation on a broad basis will be developed;
- The **research and higher education system** will be developed into an **internationally competitive development environment** for expertise and innovations;
- **Personal taxation** and other key factors essentially weakening Finland's attractiveness will be revised to a competitive level;
- **Management and training** will be developed to meet top international standards; and
- The **strategies and operations of parties** implementing innovation policy will be adapted to be in line with the basic choices of the innovation strategy.

5 DENMARK

5.1 FRAMEWORK FOR INNOVATION[xxvi]

Denmark's innovation strategy has been formulated with a clear goal in mind, namely that:

> *Denmark should be among the most attractive countries in the world to live and work in – also in 10 and 20 years from now. Denmark should be a country where everyone is optimally equipped to unfold their abilities and create prosperity for themselves and for others. A country that has a global outlook and plays an active role in the world community. A country where everyone participates in the renewal process and where everyone shares in progress and cohesion.*[xxvii]

One of the strategy's central aims is to redress what are seen as failings in the school system, one which is believed to be too expensive and of a comparably low academic standard in relation to other wealthy countries.

5.2 CURRENT STRATEGY[xxviii]

To achieve these aims the Danish government has outlined four key policy areas: world top level education, strong and innovative research, more high-growth start-ups, renewal and innovation. The aim is to achieve these with specific and, often, overlapping policy interventions.

- Under the broad initiative of ***world top performing primary and lower secondary school system*****,** the Danish Government will introduce actions to improve reading, mathematics, science English, introduce targeted national testing for forms two through to eight, introduce language screening, extend the compulsory time in full-time education from nine to ten years, introduce standardised discipline and respect rules to the classroom, assist teachers to specialise, strengthen pedagogic management, and clarifying the role of municipal councils in education.

- The initiative ***all young people should complete a general of vocational upper secondary education programme*** contains actions, which include; transferring responsibility for educational attainment to municipal government, increasing the number of practical training placements, introducing targeted teaching after form nine, the improvement of monitoring schemes, school environments and guidance, a more practice/trainee orientated approach to basic courses, providing basic vocational training to all with weak academic skills, and ensuring best educations for different educational talents and abilities.

- Actions under the initiative ***a coherent education system and professional guidance*** include: benchmarking results, enabling students to make qualified choices of education, providing guidance from the sixth form up, introduce individual transition plans, develop monitoring schemes for disadvantaged young people, encourage better feedback from general and vocational upper secondary institutions to primary and lower secondary schools, smooth out the transition from upper secondary to higher education, ensure all pupils in upper secondary attend open days at perspective higher education institutions, and provide outreach guidance activities.

- The key initiative ***education and training programmes with a global perspective*****,** includes actions such as; strengthening the teaching of English in general upper secondary education, introducing more international activities, new scholarships for young people studying abroad, setting objectives for internationalisation within institutions, introducing targets for the number of study periods abroad, set targets for courses taught in English, develop a new grading scale, market Denmark as an education-orientate country, and provide more scholarships to talented foreign students.

- To achieve a ***world top level short-cycle and medium-cycle higher education system*** the Danish government proposes to; introduce new, multi-disciplinary colleges offering a greater range of programmes, ensure short-cycle higher education programmes are gathered at fewer schools and colleges, create an independent accreditation body to evaluate all education programmes according to international standards, orientate new education programmes towards meeting new needs, strengthen cooperation between educational institutions and companies, disseminate more knowledge between universities and university colleges, improve opportunities to qualify for admission to short-cycle higher education programmes, encourage flexibility in short-cycle higher education programmes in relation to the needs of the labour market, create higher quality student practice periods and improve the professional development of teachers.

- To develop ***world top level universities***, the Danish government will endeavour to; distribute university funds according to quality, integrate universities and government research institutions, evaluate university programmes according to international standards, ensure bachelor programmes lead to better job opportunities, enable systematic dialogue between universities and employers, double the number of PhD scholarships and industrial PhD programmes, introduce an elite master's programme for exceptional students, focus on good teaching, free universities to attract talented researchers, and utilise university knowledge in society.

- The broad initiative ***more competition and better quality in public research*****,** includes the following actions; securing more funds for public research, opening up 50 per cent of research funds to competition, introducing a new model for competition between universities, increase the number of large, long term research grants, create a grant pool for research infrastructure, provide more funding for strategic research, create a better basis for prioritising, introduce a quality barometer and the evaluation of large-scale programmes, and co-finance Danish participation in international research.

- Actions under the initiative ***good framework conditions for companies' research, development and innovation*** include; increasing the number of highly educated people, collecting funds for cooperation in a single grant pool, improving the prioritisation of funding for innovation incubators, allocated funds for Authorised Technological Service Institutes on an open competitive basis, improve opportunities for private companies to participate in public-financed research, generate new knowledge about customers and markets through user driven programmes, and create a marketplace for knowledge trading.

- The initiative ***stronger competition and greater openness and transparency to strengthen innovation*** incorporates the following actions; removing of special rules and trade barriers, allow authorities access to tools to encourage competition, strengthening the courts' handling of competition-related cases, increase competition in public sector functions and service, announce more public sector functions and services openly, improve conditions for public-private partnerships, introduce Green cards to bring a greater number of skilled foreigners to Denmark, speed up the immigration/visa process, and lower tax on earned income.

- To encourage ***more high-growth strategies***, the Danish government will endeavour to; introduce teaching methods at primary and lower secondary level education which encourage innovation, strengthen the Danish Foundation for Entrepreneurship and Culture, provide courses in entrepreneurship, establish centres for new growth business, introduce tax breaks for high-growth start-ups, secure financially strong venture capital funds, introduce new financing methods for high-growth start-ups, reduce burdens on companies through digital case handling and process bankruptcy of estates procedures faster.

- Actions to further the uptake of ***lifelong learning*** include; improving the accessibility and guidance, recognising prior learning, encouraging systematic development in companies, ensuring adult education programmes in reading,

ensuring writing and arithmetic courses are more flexible and practical, improving language courses, increasing the quality and number of higher education programmes, develop a new model for the special allowance for adult education, flexible and differentiated fees and subsidies, and a special savings schemes or adult education.

6 GERMANY

6.1 BACKGROUND

As recently as 2004, Germany's innovation system was believed to '*badly need a boost*'. Prospects for future growth were labelled *dim*. The Deutsche Bank Research group recognised a number of strengths and weakness.[xxix]

STRENGTHS

- High share of employees working in R&D;
- Strong rises in companies' innovation spending;
- Good framework conditions for innovation;
- Decent output by the academic community;
- High output of triadic patents;
- Strong sales share of market novelties.

WEAKNESSES

- Slow structural change towards cutting-edge tech
- Endangered R&D spending level (government & companies)
- Weak supply of risk capital
- High regulatory burdens
- Weak and declining innovation participation of SMEs
- Dwindling supply of highly qualified personnel

6.2 CURRENT STRATEGY

Within this context the German government developed a new innovation policy in the form of a six billion euro investment programme and a High-Tech Strategy. The investment strategy covers the period 2006-09 and is ear-marked for *'projects which promise to have a great mobilisation effect on innovation and the markets of tomorrow'.*[xxx]

The High-Tech Strategy focuses on three fields of action:

- **GAINING A LEADING POSITION ON THE MARKETS OF THE FUTURE BY OFFERING TOP-CLASS AND HORIZONTAL TECHNOLOGIES**, a field of action which includes the following measures – strengthening Germany as a research base for medical technology, combating infectious diseases, security research, and energy research.[xxxi]

- **STRENGTHENING THE POWERS OF INNOVATION IN SMALL AND MEDIUM-SIZED COMPANIES**, measures here include – triggering 300 new start-ups in the field of top-class technology, funding for cooperative industrial research, and the funding of innovative leaders.[xxxii]

- **STREGTHENING GERMANY'S EFFICENCY AND INTERNATIONAL ATTRACTIVENESS**, which includes – enabling selected universities to become internationally visible centres of top research with a strong research profile, providing access to modern large-scale research equipment, attracting outstanding research talent, and expanding the promotion of the gifted in higher education with an aim of reaching out to one percent of all students.[xxxiii]

7 COMPARISONS

Although, the individual innovation strategies overviewed in this paper are the result of specific regional context, some areas of convergence exist between them.

- **EDUCATION;** All four regions place a considerable emphasis on education for example. However, how this manifests itself as policy differs from region to region. Denmark's innovation strategy could easily be shortened to *'education, education, education'* given the regions desire to redress perceived shortcomings in the education system and the belief that this will improve innovation performance. Germany by contrast combine education policy with other core aims, education is seen as a means to attract international interest in the region, rather than an end in itself.

- **GLOBALISATION;** Internationalisation is also significant to all four regions. The need to maximize their share of a globalised market place is for all a key driver to some extent. For Sweden it is a matter of seizing the opportunities presented by globalisation through FDI, by maximising the language skills of the population and by ensuring the financial climate is tempting through favourable taxation. Germany's focus on high-technology is evident in their international strategy. The availability of internationally visible research centres employing large-scale research equipment is seen as a precondition to international appeal. For Denmark, globalisation presents challenges to the education system which require action if the region is to remain competitive in terms of innovation capacity. Key to this strategy is promoting internationalisation in education across all levels, from primary to postgraduate. Finland, despite their specific recognition of globalisation as a driver of change, limits their international strategy to ensuring a favourable taxation system, preferring it seems to build indigenous innovation.

- **ENTREPRENEURSHIP/BUSINESS GROWTH;** all four regions identify business start-ups and business growth as a key drivers of innovation. Sweden has outlined strategies which will aid the growth of the innovative capacity of SME's, they argue a case for improving tax rates to encourage start-ups, see education as a tool which may be employed to inspire an entrepreneurial culture, call for the

removal of red tape, and recognise that growth, in current circumstances, must be sustainable. Finland's start-up and growth strategy includes measure which will improve the financial climate, improve business leadership, and argues for the need to renew the financial and service system to enable growth. Denmark's policy interventions designed for stimulating growth are again linked to the education system. Courses in entrepreneurship will be rolled out in conjunction with tax breaks, venture capital, and reduction in bureaucratic burdens. Germany's strategy for growth conforms to the regions general theme of increasing innovation through technology. As a result the strategies key measure is triggering 300 new start-ups in the field of top technology.

- **TECHNOLOGY;** exploiting technological advances is a theme running through all four innovation strategies. It is perhaps most evident in Germany's policy document which is itself a High-Tech strategy rather than a typical innovation strategy in the mould of the other three documents. Sweden's technological strategy is linked to its measure for sustainable growth, were defence and security technology is seen as possible tool for driving innovation in civil applications. New technology, for Finland, is a key driver of economic change; IT and bio/nanotech are seen as key growth areas. Once again Denmark's the education system is central to its strategy, specifically in measures like the creation of Authorised Technological Service Institutes.

- **PUBLIC SECTOR REFORM;** reforming the public sector is key to all regions bar Germany. Both Finland and Denmark see taxation and the removal of bureaucratic burdens as key. Sweden appears to a more robust strategy of public sector reform, one which includes; the use of IT to improve efficiency, improving public procurement and revising the public sector's role as a investor, driving social renewal in the process.

Footnotes:

[i] http://ec.europa.eu/enterprise/innovation/index_en.htm#1
[ii] http://eur-lex.europa.eu/LexUriServ/site/en/com/2005/com2005_0488en01.pdf
[iii] http://ec.europa.eu/invest-in-research/index_en.htm
[iv] European Innovation Scoreboard 2007, Comparative Analysis of Innovation Performance pg 11 - http://www.proinno-europe.eu/admin/uploaded_documents/European_Innovation_Scoreboard_2007.pdf
[v] European Innovation Scoreboard 2007, Comparative Analysis of Innovation Performance pg 34 http://www.proinno-europe.eu/admin/uploaded_documents/European_Innovation_Scoreboard_2007.pdf
[vi] Source European Innovation Scoreboard 2007, Comparative Analysis of Innovation Performance pg 07 - http://www.proinno-europe.eu/admin/uploaded_documents/European_Innovation_Scoreboard_2007.pdf

[vii] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
[viii] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
[ix] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
[x] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
[xi] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
[xii] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
[xiii] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
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[xix] http://www.sweden.gov.se/content/1/c6/03/25/51/29e722a9.pdf
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